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March 15, 2025

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Charlton Bonham Director California Department of Fish and Wildlife P.O. Box 944209 Sacramento, CA 94244-2090	Valerie Quinto Executive Officer North Coast Regional Water Quality Control Board 5550 Skylane Blvd. Suite A Santa Rosa, CA 95403

Re: NMFS Permit No. 1613; USFWS Permit No. TE 156839-0; CDFW Consistency Determination No. 2080-2008·008-01; NCRWQCB Order No. R1-2012-0088

Submission of the 8th Biennial Report of the AHCP

Pursuant to Section 6.2.7.4 of the Aquatic Habitat Conservation Plan and Candidate Conservation Agreement with Assurances (AHCP) for Green Diamond Resource Company's California Timberlands, the AHCP Implementation Agreement Section 8.1, CDFW Consistency Determination No. 2080-2008·008-01, and the Forest Management Waste Discharge Requirements (MRP R1-2012-0088), Green Diamond Resource Company hereby provides NMFS, USFWS, CDFW, and NCRWQCB with the 9th Biennial Report of the AHCP.

Sincerely,

Mathew Nannizzi
Aquatic Biologist-Supervisor
Green Diamond Resource Company
(707) 668-4403

Cc: (electronic)

Clarence Hostler, National Marine Fisheries Service
John Peters, U.S. Fish & Wildlife Service
Nick Simpson, California Department of Fish and Wildlife
Jonathan Warmerdam, North Coast Regional Water Quality Control Board
Jim Burke, North Coast Regional Water Quality Control Board

9th Biennial Report
Aquatic Habitat Conservation Plan

Submitted to

National Marine Fisheries Service

and

United States Fish and Wildlife Service

By
Green Diamond Resource Company

in fulfillment of requirements pursuant to
NMFS Permit No. 1613
and
USFWS Permit No. TE156839-0

MARCH 15, 2025

Certification of Report

Under penalty of law, I certify that, to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this report, that information submitted is true, accurate, and complete.

Peter Jackson

Peter Jackson, Vice President and General Manager
Green Diamond Resource Company

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I. Introduction

On June 12, 2007 the National Marine Fisheries Service and the United States Fish and Wildlife Service accepted Green Diamond Resource Company's (GDRCo) Aquatic Habitat Conservation Plan and Candidate Conservation Agreement with Assurances (AHCP). On this date, NMFS issued GDRCo an ESA section 10(a)(1)(B) permit authorizing incidental take coverage for listed and unlisted populations of three fish under its jurisdiction: Chinook salmon, coho salmon, and steelhead. In addition, the USFWS issued Green Diamond an enhancement of survival permit for two unlisted fish and two unlisted amphibians under its jurisdiction: resident rainbow trout, coastal cutthroat trout, tailed frog, and southern torrent salamander. The incidental take permit (ITP) and the enhancement of survival permit (ESP) collectively are cited as "Permits". NMFS and USFWS collectively are cited as "the Services." The species identified above collectively are cited as the "Covered Species."

GDRCo began implementing the AHCP on July 1, 2007. The AHCP includes management measures for riparian zones, geologically sensitive areas, forest roads, and harvesting activities. The riparian management zones provide shade, nutrients and large woody debris recruitment potential for streams through tree retention. The slope stability measures provide protection for upslope areas to minimize management-related landslides and sediment delivery to streams. The road management plan consists of an accelerated road upgrading and decommissioning program to reduce road-related sediment delivery to streams. The harvest-related measures consist of seasonal and equipment restrictions for silvicultural and logging activities to minimize the level of ground disturbance.

The AHCP also includes a monitoring program that was designed to evaluate the implementation and overall effectiveness of the plan and to fine-tune specific conservation measures as needed through adaptive management. The effectiveness monitoring will measure the success of the conservation measures in relation to specific biological goals. These biological goals are to maintain cool water temperatures for aquatic species covered by the AHCP, minimize management related sediment inputs to streams, provide for recruitment of large woody debris for stream habitat, maintain amphibian populations across the landscape, and monitor and adapt the plan as needed to optimize conservation measures to benefit the Covered Species.

The following report documents the twelfth and thirteenth full year of the AHCP implementation and includes details to comply with the AHCP and the Implementation Agreement (IA). Included are sections related to the application of conservation measures in timber harvest plans, compliance training programs for employees and contractors, road management implementation, and other information required for the biennial reports as specified in Section 8.0 of the Implementation Agreement.

The reporting period for this report is January 1, 2023 through December 31, 2024.

II. AHCP Compliance

A. AHCP Implementation Plan

During the early stages of implementing the AHCP it was mutually agreed upon by GDRCo and the Services that an Implementation Plan should be prepared that would serve as a road map outlining how GDRCo will achieve the biological goals of the AHCP through implementing the Plan. GDRCo developed an AHCP Implementation Plan (IP) and submitted a revised version in February 2009. NMFS, on September 29, 2009, and the USFWS, on October 13, 2009 provided letters to GDRCo acknowledging receipt of the IP and had no objections to the content of the document. The Services and GDRCo acknowledge that the IP serves as a foundational document that summarized recent activities to implement the AHCP to date, as well as planned approaches that GDRCo will use to ensure the AHCP is successfully implemented. It was also understood by all Parties that the IP provides guidance for the initial stages of implementing the AHCP and is intended to remain flexible and adaptive throughout the life of the AHCP, as future conditions warrant.

B. Field Trials and Demonstrations with Mechanized Equipment

Under AHCP Section 6.2.4.1 GDRCo may conduct field trials with mechanized equipment for silvicultural operations provided that we have given assurances to the Services that the equipment will not cause compaction or soil displacement that is measurably greater than the equipment or methods previously used. GDRCo has also proposed a new operation via a demonstration to show the feasibility of conducting the activity with very careful planning and assessment and by following specific conditions with oversight. The field trials and demonstrations that were conducted during the reporting period for this Biennial Report are described below.

1. Field Trials with Cut-to-Length Harvester

In 2016 GDRCo began assessing the use of state of the art cut-to-length equipment manufactured by Ponsse for ground based commercial thinning operations during the summer period. The ground based cut-to-length equipment used consisted of a feller-buncher harvester (Ponsse Bear model) with a H8 processor head. The feller-buncher has eight low pressure rubber tires with independent suspension. The tires are interconnected in pairs with tracks that provide additional traction and further reduce overall ground pressure. The feller-buncher has an articulating processor head that cuts, delimbs, bucks and bunches logs. As each harvested tree is processed, logging slash is laid out in front of the harvester to travel on to avoid bare mineral soil and to reduce ground compaction. Like a shovel logger, the feller-buncher operates on the terrain without the need for constructed skid trails because it has ample ground clearance to clear cut stumps and other obstacles (AHCP Section 6.2.4.7). During thinning operations, the harvester only processes short logs which are loaded onto a forwarder (e.g. Ponsse ElephantKing model), so there is no dragging of logs which is typical during tractor and skidding operations. The ElephantKing forwarder has a similar frame, tire and suspension configuration as the feller-buncher except it is capable of loading and carrying processed logs. The forwarder follows the same access path as the feller-buncher which has created a slash packed trail. The original language in the AHCP provided provisions for feller-buncher operations during the summer and winter period however it limited forwarding operations to the summer period only (AHCP Section 6.2.4.7).

On August 1, 2016 GDRCo submitted a letter to the Services describing the intent to conduct a field trial using state of the art cut-to-length forwarding equipment manufactured by Ponsse for ground based commercial thinning operations during the winter period. As described above GDRCo conducted preliminary evaluations of the equipment during the summer of 2016 to assess the viability of the forwarding operations and its potential for wintertime use and determined the results were very favorable. GDRCo had multiple discussions with the Services and held a field trip on August 18, 2016 at a summer-based cut-to-length operation with the equipment proposed for use during the winter.

In October 2016 GDRCo submitted a revised letter to the Services that included additional measures proposed by the Services and a description and proposal for quantitatively evaluating the site impacts from the forwarding operations related to potential water quality effects, fire hazard and stand condition following operations. GDRCo also worked with Dr. Han, former professor at Humboldt State University, who had two graduate students that conducted studies to evaluate cost and productivity of the cut-to-length operations (Baek, 2018) as well as impacts on soils and residual trees (Hwang, 2018).

In November 2016 GDRCo received support from the Services on the proposed winter field trial with the Ponsse forwarder for use on slopes less than or equal to 45%. In December 2016, GDRCo and the Services had a field visit to both an active and recently completed winter cut-to-length forwarding operation. In June 2017 GDRCo and the Services had a field visit to the completed winter cut-to-length forwarding operations. We walked several access trails in several units to review the data collection process and summary results from GDRCo’s evaluation of the operations as well as the Dr. Han’s graduate student projects.

In October 2017, GDRCo provided the Services a final summary report on the results of the 1st year field trial with the Ponsse forwarder.

Due to the success of the winter forwarding operation in the 1st year field trial, GDRCo proposed and received concurrence from the Services in October 2017 to conduct a 2nd year field trail which included operating forwarders on slopes up to 45% during the winter period. Forwarding during the 1st year field trial occurred on slopes that averaged less than or equal to 15%. In May 2019, GDRCo provided the Services with a summary report from the 1st and 2nd year field trial results.

The results from the 1st and 2nd year field trials suggest that winter forwarding with the cut-to-length low ground pressure equipment is a viable operation that does not construct or require the use of skid trails and can minimize bare mineral soil and minimize ground disturbance by placing and operating on slash generated by the activity. Based on these results, GDRCo included a minor modification request to add winter forwarding with cut-to-length equipment to the AHCP. The Services provided GDRCo interim authorization to continue the field trial for a 3rd season while the minor modification was being developed and approved. On July 10, 2019, the Services approved the minor modification authorizing forwarding operations during the winter period with specific provisions that were incorporated in the AHCP (see Section II.D.3 below).

2. Demonstration for Road Rocking During the Winter Period

The AHCP permits road rocking operations during the period when road upgrading can occur (AHCP 6.2.3.9.2 #3) which is during the summer period and the dry fall and early spring drying conditions (AHCP 6.2.3.4.2 and 6.2.3.4.3). Occasionally there are extended periods of dry weather during the winter period that occurs which GDRCo believes can create conditions that are suitable to conduct road rocking activities without causing negative environmental effects. In 2019 GDRCo developed a proposal to conduct a road rocking demonstration during the 2019/2020 winter period to show the feasibility of this potential winter season activity. A field trip with the Services was held on September 13, 2019 to discuss the proposed winter road rocking demonstration. We visited several road segments that GDRCo propose for the demonstration and reviewed and discussed all the mitigation measures that would be followed. GDRCo submitted the proposal on September 27, 2019 and the Services approved the winter road rocking demonstration on October 25, 2019. GDRCo and the Services conducted another field visit on February 10, 2020 to observe an active winter road rocking operation as well as visit a couple road segments that were rocked earlier in the winter period and had experienced winter storms to evaluate how the roads performed following rain events. It was evident that the operations were successfully being implemented.

Following the 2019/2020 winter period, GDRCo's Sr. Aquatic Biologist conducted field visits with the Roads Supervisors to all the road segments that were included in the winter road rocking demonstration to photograph and assess the road conditions since the COVID-19 pandemic prevented the Services from participating in field trips during the 2020 summer period. GDRCo provided the Services with a summary report of the assessments on October 12, 2020. GDRCo determined that the winter road rocking demonstration was very successful. GDRCo also submitted a proposal for a minor modification request to Services requesting the AHCP be modified to allow for winter road rocking with specific provisions. The Services' approval of the proposed minor modification is pending.

C. Commercial Thinning

In 2010, GDRCo implemented a study to evaluate the economic viability and operational feasibility of conducting commercial thinning on certain properties within the Plan Area. GDRCo uses the Functional Approach to thinning that has been adapted to young-growth, even-aged stands of Redwood and Douglas-fir. With this method, trees from all size classes and crown positions may be removed to create open spaces in the canopy to promote growth of the retained trees. Small intermediate and understory trees may be harvested if they are of commercial size and economical to harvest. Codominant and dominate trees with poor form or low live crown ratio are selected for harvest to open up the canopy, and some trees are selected for harvest to reduce stand density and improve leave tree spacing. The crop trees retained exhibit the highest quality and fastest growth rates to take advantage of the crown openings. The overall objective is to accelerate diameter growth, increase heartwood production, and improve log quality. GDRCo's Functional Approach to thinning is very similar to the Commercial Thinning Method in the State Forest Practice Rules. In some site-specific cases, GDRCo may utilize a Forest Practice Rule "Alternate Prescription" that meets these same silvicultural objectives but is a better fit due to stand structure and forest practice rule requirements.

GDRCo forestry staff carefully prepares THPs to ensure that this management technique incorporates mitigations that are consistent with the AHCP requirements. GDRCo has not experienced any issues with the current AHCP measures outlined in AHCP Section 6.2.4.3. We are not conducting any thinning operations in the riparian areas of the thinning THPs as per AHCP Sections 6.2.1.2 and 6.2.1.4. As per the requirements in this AHCP section, riparian management zones are identified and mapped as no harvest areas in each thinning unit and a selection harvest entry within these riparian areas will coincide with the future even-aged harvest of the stand. However, GDRCo has recently been discussing with the Services the idea of applying GDRCo's Functional Approach to thinning in riparian zones to similarly promote faster diameter growth of trees in these areas. GDRCo anticipates submitting a proposal to the Services in 2021, requesting authorization of additional entries into RMZs that will provide benefits to terrestrial and aquatic species and their habitats.

In the past 10 years, GDRCo has commercially thinned approximately 2,000 to 4,000 acres per year depending on availability of timber stands that are suitable for thinning and economic factors that are favorable to thinning. GDRCo plans to continue to conduct thinning operations on approximately 2,000 to 4,000 acres per year over the next 10 years. As a result of the thinning operations, we expect to see increased vigor and growth of the remaining stands.

D. AHCP Minor Modifications

Under Section 12.1 of the Implementation Agreement (IA), GDRCo, NMFS, or USFWS (referred to collectively as “Parties” or individually as “Party”) may propose minor modifications to the Plan, the Permits, or the IA by providing written notice to all the other Parties. A proposed minor modification becomes effective and the Plan deemed modified accordingly, immediately upon unanimous approval from all Parties. Any Party that objects to a proposed modification must provide written notice to the other two Parties. As per Section 12.1.1 of the IA, a receiving Party may object to a proposed minor modification based on reasonable belief that the modification would result in, 1) operations, burdens or obligations under the Plan that are significantly different from those analyzed in connection with the original Plan, 2) adverse effects on the environment that are new or significantly different from those analyzed in connection with the original Plan, or 3) additional take not analyzed in connection with the original Plan.

There were 2 minor modifications proposed by GDRCo that the Services evaluated and approved under IA Section 12.1 during the reporting period for this Biennial Report. The modifications that were made to the AHCP are summarized below.

1. Minor Modification to AHCP Sections 6.2.3.9.2 and 6.3.3.8.1 Winter Period Road Rocking.

In 2019 GDRCo proposed to conduct a road rocking demonstration during the 2019/2020 winter period to show the feasibility of this proposed winter season activity. We held a field trip with the Services on September 13, 2019 to discuss the proposed winter road rocking demonstration. We visited a few road segments that we proposed to include in the demonstration and reviewed and discussed all the mitigation measures that would be followed. GDRCo submitted the proposal on September 27, 2019 and the Services approved the winter road rocking demonstration on October 25, 2019. We conducted another field visit on February 10, 2020 to observe an active winter road rocking operation as well as visit a couple road segments that were rocked earlier in the winter period and had experienced winter storms to evaluate how they performed following rain events. On October 12, 2020, GDRCo submitted to the services a minor modification proposal allowed road rocking and winter site preparation with shovel logging equipment during the winter period.

On December 20, 2021, the Services submitted a letter to GDRCo approving the minor modification request. The minor modification changed language in the existing AHCP Section 6.2.3.9.2 (road rocking) and existing AHCP Section 6.3.3.8.1 (road rocking).

Note the text in italics are excerpts from the AHCP and underlined text is the language that was added with this minor modification.

6.2.3.9 Routine Road Maintenance and Inspection Plan

6.2.3.9.2 Time of Year Restrictions

1. *Green Diamond may carry out patch (spot) rocking, brushing, cleaning inlets and outlets of culverts, cleaning ditches where poor drainage is occurring, repairing or maintaining existing waterbars, replacement of a failed or imminently failing culvert along a needed access road, and site specific road surface grading for maintaining the integrity of the road surface year-round, including during the winter period.*

2. *Grading will not be used to blade off wet soil to provide conditions for extended periods of operation on a deteriorated road surface.*

3. *The installation of waterbars, rolling dips and critical dips, general project grading for shaping the road surface, road outsloping, road rocking, resurface rocking, cleaning ditch lines, and general culvert replacements may occur only during the period when road upgrading may occur (see 6.2.3.4.1, 6.2.3.4.2, and 6.2.3.4.3) except as allowed in item #4 below.*

4. Road rocking and resurface rocking can occur during the winter period when the following conditions are met:

    a. The existing road to be rocked is hydrologically disconnected with ditch relief culverts and rolling dips and have critical dips associated with each stream crossing.

    b. Minimize daily road opening (i.e. minor road surface preparation such as grading out water bars, installing drainage cutouts, minor vegetation clearing on the road surface to facilitate geotextile fabric installation and installing additional ditch relieve culverts where needed) to an amount that can be rocked in a single day. The winter rocking activities will be conducted from roads with a rocked surface and only extend onto dirt surfaces that they intend to rock on any particular day. Waterbars will be reinstalled, as needed, on any opened road segment that is unrocked by the end of each day if rain is forecast the next day.

c. Geotextile fabric will be laid out on the road surface prior to road rocking.

d. No rocking can occur if rain occurred the previous day.

e. No rocking can occur on days of forecasted rain (20% or greater chance) unless the rain is forecasted to occur for after 5 p.m. that day.

f. Road rocking will cease when the activity results in runoff of waterborne sediment in amounts sufficient to cause a visible increase in turbidity in any ditch or road surface that drains into a Class I, II or III watercourse.

g. Log hauling will not occur on any road segment that contains watercourse crossings that were winter rocked during the current winter period. Road segments with no watercourse crossings that were winter rocked during the current winter period can be used for log hauling.

h. Stream crossings with road approaches (between the hydrologic divide) that were rocked prior to the winter period can be used for log hauling during the winter period provided the intervening road segments are rocked (including during the winter period).

i. Two days of no rain must be met before rock hauling across winter rocked watercourse crossings can occur.

j. Additional clean competent rock will be applied by the end of the day to watercourse crossings if rutting or pumping of fines is occurring when rain is forecasted for the next day.

6.3.3.8.1 Type and Timing of Maintenance Activities

Road maintenance activities that will be conducted include but are not limited to brushing, waterbarring, constructing rolling dips, culvert replacement, grading (including berm removal or maintenance where appropriate), installation of critical dips at watercourse crossings to reduce diversion potential, outsloping roads, patch rocking, dust abatement, resurface rocking, cleaning ditches, and cleaning inlets and outlets of culverts. Patch (spot) rocking, brushing, cleaning *inlets and outlets of culverts, cleaning ditches where poor drainage is occurring (e.g., cleaning a ditch line along a sloughed cut-bank), repairing or maintaining existing waterbars, replacement of a failed or imminently failing culvert along a needed access road, and site specific road surface grading for maintaining the integrity of the road surface (i.e. redistribution of existing rock, filling pot holes, and distributing new patch rock) will be allowed year round including during the winter period. The intent is to allow winter grading to fix localized bad spots on the road surface before the deterioration of longer road segments. Grading will not be used to blade off wet soil to provide conditions for extended periods of operation on a deteriorated road surface. The installation of waterbars, rolling dips and critical dips, general project grading for shaping the road surface, road outsloping, road rocking, resurface rocking, cleaning ditch lines, and general culvert replacements will be allowed only during the period when road upgrading can occur (Section 6.3.3) except as allowed below.*

<u>Road rocking and resurface rocking can occur during the winter period when the following conditions are met:</u>

a. <u>The existing road to be rocked is hydrologically disconnected with ditch relief culverts and rolling dips and have critical dips associated with each stream crossing.</u>

b. <u>Minimize daily road opening (i.e. minor road surface preparation such as grading out water bars, installing drainage cutouts, minor vegetation clearing on the road surface to facilitate geotextile fabric installation and installing additional ditch relieve culverts where needed) to an amount that can be rocked in a single day. The winter rocking activities will be conducted from roads with a rocked surface and only extend onto dirt surfaces that they intend to rock on any particular day. Waterbars will be reinstalled, as needed, on any opened road segment that is unrocked by the end of each day if rain is forecast the next day.</u>

c. <u>Geotextile fabric will be laid out on the road surface prior to road rocking.</u>

d. <u>No rocking can occur if rain occurred the previous day.</u>

e. <u>No rocking can occur on days of forecasted rain (20% or greater chance) unless the rain is forecasted to occur for after 5 p.m. that day</u>.

f. <u>Road rocking will cease when the activity results in runoff of waterborne sediment in amounts sufficient to cause a visible increase in turbidity in any ditch or road surface that drains into a Class I, II or III watercourse.</u>

g. <u>Log hauling will not occur on any road segment that contains watercourse crossings that were winter rocked during the current winter period. Road</u>

segments with no watercourse crossings that were winter rocked during the current winter period can be used for log hauling.

h. Stream crossings with road approaches (between the hydrologic divide) that were rocked prior to the winter period can be used for log hauling during the winter period provided the intervening road segments are rocked (including during the winter period).

i. Two days of no rain must be met before rock hauling across winter rocked watercourse crossings can occur.

j. Additional clean competent rock will be applied by the end of the day to watercourse crossings if rutting or pumping of fines is occurring when rain is forecasted for the next day.

Weather patterns, antecedent moisture conditions, road surface drying and overall soil conditions vary extensively both spatially and temporally across GDRCo's ownership. As a result, describing specific weather, road and soil conditions that would create suitable prerequisites to initiate winter road rocking activities would be difficult. Instead, GDRCo relies on the experience and expertise of our Road Supervisors/Administrators to make the determination of where and under what conditions it is appropriate to conduct winter road rocking following the provisions above. The Road Supervisors/Administrators will carefully evaluate road conditions and closely monitor weather conditions and weather forecasts for their operating areas to insure that a stable operating surface is maintained and no runoff of sediment results in amounts sufficient to cause a visible increase in turbidity to any ditch or road surface that drains into a Class I, II or III watercourse.

2. Minor Modification to AHCP Section 6.2.4.2.3 Winter Site Preparation with Shovel Logging Equipment.

The AHCP discusses shovel logging operations in Section 6.2.4.7 where it provides for its use and delineates limitations. Because the operating conservation measures of the AHCP were set in place several years before the Plan was approved during a time when GDRCo was still experimenting and learning the capabilities of shovel logging, the full array of harvesting opportunities and slash handing procedures with shovel equipment were not fully incorporated within the AHCP. One such example was identified early on in the implementation of the AHCP where the Services approved an AHCP minor modification in 2019 to permit GDRCo to pile logging slash concurrent with shovel logging activities during the winter period. In the minor modification approval, the Services recognized that piling of excess slash concurrently with shovel yarding operations during the winter period will not cause additional ground disturbance impacts over that which would be caused by the exclusive shovel yarding of logs. In fact the concurrent activity would eliminate subsequent remobilization and additional passes over the same ground at a later time to achieve the desired site prepared condition.

AHCP Section 6.2.4.7 provides for the use of shovel logging operations during the winter period with specific operational restrictions. However in the original AHCP, Section 6.2.4.2.3 did not allow any mechanical site preparation during the winter period. The AHCP minor modification was approved as follows to allow for winter period site preparation:

1) Green Diamond will minimize use of machine piling with tractor-and-brushrake; other mechanized methods or equipment will be used preferentially.

2) Use of mechanized site preparation methods will be limited to the period beginning May 15th and ending October 15th.

3) Mechanized slash piling with shovel logging (Helms, 1998) equipment may be conducted concurrent with shovel harvesting operations during the winter period, subject to all limitations under Section 6.2.4.7 and items (a) and (b) below.

    a. Site preparation operations with shovel logging equipment, are limited to slopes averaging less than 30% gradient.

    b. Shovel logging equipment will operate on a slash surface during site preparation operations.

At the time the minor modification was proposed and approved, GDRCo was not conducting shovel logging on slopes that exceeded 30% due to safety concerns. However, there have been many improvements and enhancements in the shovel equipment over the last 11 years including more powerful but lighter machines, lower ground pressure undercarriages, and self-leveling cabs that improves the stability of the machines for use on steeper slopes.

GDRCo can safely, efficiently, and effectively shovel log (and mechanically site prep) on steeper slopes including during the winter period. GDRCo believes that the piling of excess slash concurrently with yarding operations during the winter period will not cause additional ground disturbance impacts over that which would be caused by the exclusive yarding of logs. As such GDRCo is proposing a minor modification to the AHCP to remove the slope gradient limit for conducting winter time mechanized site preparation with shovel machines. This will align winter shovel site preparation conservation measures with those of the winter shovel logging operating conservation measures.

In 2016 GDRCo began investigating new state of the art cut-to-length equipment to conduct ground based commercial thinning operations which were initially initiated during the summer period. Following successful outcomes with the equipment, GDRCo submitted a letter to the Services in August 2016 describing our interest to conduct a field trial with the cut-to-length forwarding equipment for ground based commercial thinning operations during the winter period. GDRCo conducted a multi-year field trial as described above in Section II. B. above. Following the successful testing of the equipment and evaluation of the ground impacts during winter use, we determined that this is a viable operation. On May 31, 2019, GDRCo submitted to the Services a minor modification proposal to allow winter forwarding with cut-to-length equipment.

On December 20, 2021, the Services submitted a letter to GDRCo approving the minor modification request. The minor modification changed language in the existing AHCP Section 6.2.4.2.3 (mechanized site preparation methods).

Note the text in *italics* are excerpts from the AHCP and underlined text is the language that was added and the strikethrough is the language that was removed with this minor modification.

6.2.4.2 Site Preparation Standards

6.2.4.2.3 Mechanized Site Preparation Methods

1) *Green Diamond will minimize use of machine piling with tractor-and-brushrake; other mechanized methods or equipment will be used preferentially.*

2) *Use of mechanized site preparation methods will be limited to the period beginning May 15th and ending October 15th* <u>except as allowed in item #3 below.</u>

3) *Mechanized* <u>site preparation</u> ~~slash piling~~ *with shovel logging (Helms, 1998) equipment may be conducted concurrent with shovel harvesting operations during the winter period, subject to all limitations under Section 6.2.4.7 and items (a)* ~~and (b)~~ below.

   a. ~~Site preparation operations with shovel logging equipment, are limited to slopes averaging less than 30% gradient~~.

   b. *Shovel logging equipment will operate on a slash surface during site preparation operations.*

E. Forms for RPFs and Conservation Planning Staff to Document Pre-Harvest Conservation Measures for Each THP and Compliance with Those Measures Post-Harvest

RPFs, Operations personnel and other GDRCo Conservation Planning professionals utilize a combined form to identify, categorize, and document THP items that are managed and monitored under the Northern Spotted Owl and Aquatic HCPs. The form is used to summarize the specific application of HCP measures for each THP to help track these measures and features on the landscape. The summarized information is used to monitor compliance with GDRCo's NSO and Aquatic HCPs and is used to meet the reporting requirements of these Conservation Plans. A summary of the information collected on the Forms related to the implementation of the AHCP for approved THPs is provided in Section II.F.2 below. A summary of the information collected on the Forms related to the implementation of the AHCP for completed THPs is provided in Section II.F.3. It should be noted that the information collected for approved THPs is a "plan" and is subject to change for a variety of reasons or circumstances that might occur during the life of the THP. Some of these reasons/circumstances include but are not limited to; GIS errors, depletion corrections based on final harvest data, plan amendments, canceled plans, and resubmitted plans. Although the information associated with approved THPs may be subject to change during the life of the THP, it typically does not result in substantial variances in the average or total THP values.

F. Summary of THP Conservation Measures and Compliance with Those Measures While Operating Under the AHCP

1. Notice of Filings

As required in AHCP Section 6.2.7.2 and IA Section 4.1 (c), GDRCo has provided the Services with 80 new notification letters from January 1, 2023 through December 31, 2024, indicating that GDRCo has submitted a proposed THP within the AHCP Plan Area. The letter to the Services includes the Official Notice of Filing signifying the THP has been accepted by CalFire for filing, a copy of the THP map(s), a copy of the road-work table that will be completed as part of the Annual Work Plan associated with the Master Agreement for Timber Operations (if applicable), and a description and justification of any allowable AHCP exceptions (if applicable).

2. Summary of Conservation Measures for Approved AHCP THPs

<u>Overall totals/averages</u>

There were 82 THPs approved by CalFire within the Plan Area between January 1, 2023, and December 31, 2024. Table 1 is a general summary of acres approved for harvest, by harvest type, for the reporting period. The approved THPs consist of 12,858 total acres from 418 individual harvest units. The THPs range in size from 2 to 551 acres and average 160 acres. There are on average 5.1 harvest units per THP and the average unit size is 31 acres.

Due to a change in GDRCo's harvesting philosophy around 2010, our silviculture methods now include a substantial amount of commercial thinning (see Section II.C for additional discussion of this activity). Due to a technicality in the state rules for commercial thinnings, GDRCo sometimes determines that the most appropriate silviculture designation for the commercial thinnings would be Alternative Prescription. As a result, there is an inflated amount of Alternative Prescription acres shown in Table 2 which, in early reporting years, would have been represented in the "Other" harvest type. The number of acres of true Commercial Thinning (according to the state rules) for approved plans has also increased since that time; so those acres have been separated out from the "Other" category.

The total area listed in Table 1 does not equal the sum of the silviculture acres in the same table; there is a difference of 119 acres. The difference is attributable to rounding errors and a variance in the way road Right-of-Way acres can be reported as they are typically not included in the Total Acres of a harvest unit.

3. Summary of Conservation Measures for Completed AHCP THPs

Overall totals/averages

Completed THPs for this report include AHCP THPs where all the felling, logging, loading, and hauling have been completed for all the units in the timber harvest plan. Road work associated with completed THPs may or may not be finished and therefore will not necessarily match the completion of a THP according to CalFire's definition. Compliance of the AHCP regarding completion of road work is based on the amount of work accomplished each year as measured in dollars spent on treating high and moderate priority sites and not at the THP level (see Section V.C). Therefore, the status of road work associated with individual THPs is not necessary in considering a THP as completed for purposes of this biennial report.

There was a total of 56 THPs that met the criteria for completed THPs during the current reporting period. The completed THPs ranged from a total of 3 to 383 acres in size and included a total of 277 harvest units that ranged in size from 3 to 249 acres. The Post-harvest completion forms for individual THPs are provided in Appendix A. Table 2 provides a summary of the acres harvested by harvest type for the 56 completed THPs.

The total area listed in Table 3 does not equal the sum of the silviculture acres in the same table; there is a difference of 207 acres. The difference is attributable to rounding errors and a variance in the way road Right-of-Way acres can be reported as they are typically not included in the Total Acres of a harvest unit.

Riparian

The average area of riparian features (aside from seeps, ponds, and wet areas) provided per THP was 32 acres. Table 3 summarizes the number of completed THPs that contained riparian features and the length of each feature in approved THPs with prescribed AHCP protection measures. There was a total of 32 wet areas, 19 seeps/springs and 8 ponds in 22 THPs that were provided with an average of 0.62 acres of protection.

Roads

All but four of the 56 completed THPs had proposed road work associated with them. As summarized in Table 4, the most common proposed road work associated with a THP was temporary road construction. As described in the AHCP, temporary road construction is designed for single use in a THP and is decommissioned upon completion of operations. This practice minimizes the risk of sedimentation from unused roads and reduces the amount of future road maintenance liability. It is also important to note that if temporary road construction is proposed in a THP, it does not mean that the road was constructed. In many cases the RPF provides additional flexibility to operators by identifying areas where a temporary road can be built if it is needed for operations.

Table 1. Summary of areas (acres) for each harvest type for the 82 approved THPs.

	Harvest Type							
	Total Area	**Clearcut**	**Selection**	**No Harvest**	**Alternative Prescription[a]**	**Right-of-way**	**Commercial Thin**	**Other**
Total Area (acres)	12,858	7,960	1,662	1,312	9	60	1,910	96
Number of THPs	82	70	69	78	2	24	13	7
Number of THP Units	418	338	327	325	2	N/A	42	9
Average Area (acres) per Unit	31	22	5	4	4	N/A	45	NA

[a] The majority of the Alternative Prescription acres are associated w ith GDRCo's commercial thinning operations as described in Section II.C.

Table 2. Summary of areas (acres) for each harvest type for 56 completed THPs.

		Harvest Type						
Summary Statistics	**Total Area**	**Clearcut**	**Selection**	**No Harvest**	**Alternative Prescription[a]**	**Right-of-way**	**Commercial Thin**	**Other**
Total Area (acres)	9,280	5,500	1,623	733	233	48	1,350	0
Number of THPs	56	51	51	55	5	27	8	0
Number of THP Units	277	252	230	188	7	N/A	25	0
Average Area per Harvest Unit (acres)	32	22	7	4	33	N/A	57	N/A

[a] The majority of the Alternative Prescription acres are associated with GDRCo's commercial thinning operations as described in Section II.C.

Table 3. Summary of the riparian features and the average length of each feature in the 56 completed THPs with prescribed AHCP protection measures, during the reporting period.

Riparian Features	Number of THPs with Riparian Features	Total Length of Riparian Features with AHCP Protection (feet)
Class I	27	77,669
Class II-1	56	200,791
Class II-2	53	271,540
Class III Modified Tier A	2	10,790
Class III Tier A	38	138,765
Class III Tier B	7	4,313
Class II-FPR	4	1,904

Table 4. Summary of proposed road work and the average length of proposed road work in the 52 completed THPs with road work, during the reporting period.

Road Work Type	Number of THPs with Proposed Road Work	Average Length of Proposed Road Work per THP (feet)
New Permanent Road Construction	3	722
New Seasonal Road Construction	38	2,714
Temporary Road Construction	40	4,109
Temporary Road Decommissioning	4	2,680
Reconstruction	12	730
Permanent Decommissioning	1	614

Geology

Geomorphic features defined within the AHCP include; deep-seated landslides (DSL), headwall swales (HWS), riparian slope stability management zones (RSMZ), slope stability management zones (SMZ), shallow rapid landslides (SRL), channel migration zones (CMZ), and floodplains. Table 5 summarizes the geomorphic features GDRCo observed within the 56 completed THPs for the current reporting period. RSMZs were the most frequently observed feature, which is to be expected as they are associated with steep slopes adjacent to Class I and Class II watercourses.

The distribution of geomorphic features and their association with the different types of watercourses is outlined in Table 6. The geomorphic features were most commonly associated Class II-2 watercourses. This is a logical observation as there was more linear length of Class II-2 watercourse in the approved THPs than any of the other watercourse types, which in turn equals more area of hill slopes adjacent to the Class II-2 watercourses that may intersect a geomorphic feature. It shall be noted that channel migration zones and floodplains are not included in this table as they are only associated with Class I watercourses.

All SSSs have an RSMZ but they may or may not have an SMZ associated with them. There are fewer SMZs than RSMZs since the SSS prescriptions are based on slope and may terminate once a qualifying break-in-slope has been identified (AHCP Section 6.2.2.1). Therefore, a SSS buffer may not extend as far as the SMZ resulting in more RSMZs than SMZs. There was a total of 31 THPs with RSMZs and a total of 12 THPs with SMZs delineated in the 56 completed THPs during the reporting period. Table 7 provides a more detailed summary of GDRCo's SSS prescriptions observed during the reporting period.

Table 5. Summary of geomorphic features observed within THPs during the reporting period.

Geomorphic Features	Number of THPs per Feature Type	Area of Features that were Afforded Default Protection (acres)
DSL	15	135
HWS	2	0.4
RSMZ (SSS)	31	224
SMZ (SSS)	12	57
SRL	35	98
CMZ	3	7
Floodplain	-	-

Table 6. The distribution of geomorphic features by watercourse type.

Watercourse Type	Geomorphic Feature				
	DSL	HWS	RSMZ	SMZ	SRL
Class I	9.4%	-	11.2%	22%	11.1%
Class II-1	22.7%	50%	33.5%	44%	24.7%
Class II-2	52.8%	50%	55.3%	34%	51.2%
Class III Modified Tier A	-	-	-	-	4.2%
Class III Tier A	15.1%	-	-	-	6.5%
Class III Tier B	-	-	-	-	2.3%
Total	100%	100%	100%	100%	100%

Table 7. Summary of SSS prescriptions associated by watercourse type.

	Watercourse Type		
	Class I	Class II-1	Class II-2
Total Area of SSS (combined RSMZ and SMZ) (acres)	55	72	143
Average Area of SSS per THP (acres)	6.8	3.4	5.3
Total Area of RSMZ (acres)	37	52	126
Average Area of RSMZ per THP (acres)	4.6	2.5	4.9
Total Area of SMZ (acres)	18	20	17
Average Area of SMZ per THP (acres)	4.4	2.9	2.2

Note: There were 31 THPs with RSMZs and 12 THPs with SMZs.

Exceptions

There were a total of 39 exceptions that were applied to 11 completed THPs during the reporting period; of the 39 exceptions, 33 were associated with AHCP geologic areas (harvest and road related). Table 8 summarizes the number of AHCP exceptions and Table 9 summarizes the total area of alternative geologic prescriptions that were applied to geomorphic features. The majority of AHCP exceptions were associated with alternative geologic prescriptions on geologic areas of concern. Most of the alternative geologic prescriptions were composed of varying levels of “selection” (Table 10). Clearcut areas accounted for 0.75% of the alternative geologic prescription areas and typically involve slides that do not deliver to a watercourse or road construction on or near a landslide that involves clearing of trees. Aside from no harvest, each of the other alternative geologic prescription types were recommended by a Professional Geologist based on site specific review.

Table 8. Summary of AHCP exceptions.

AHCP Exception Type	Number of AHCP Exceptions
Alternative Geologic Prescription	31
Class II Skid Intrusion	2
Class III Skid crossing	1
Par Log Suspension RMZ	2
Road Construction in RSMZ/SMZ	1
Road Construction on a SRL	1
Road Construction on a DSL	1

Table 9. Summary of timber harvest plans with alternative geologic prescriptions.

Geomorphic Feature	Total Area (acres) of Alternative Geologic Prescriptions by Feature Type
DSL	55
HWS	-
RSMZ (SSS)	-
SMZ (SSS)	-
SRL	4.7

Table 10. Summary of harvest-related alternative geologic prescriptions and area of alternative geologic prescriptions applied per THP.

Alternative Prescription Type	Area of Alternative Geologic Prescription (acres)	Numbers of THPs with Alternative Geologic Prescription
No Harvest	3.6	3
75 ft^2 Basal Area Retention	13	3
100 ft^2 Basal Area Retention	37.4	3
150 ft^2 Basal Area Retention	4	1
Clearcut	0.75	1

Hazard Abatement Operations

There are five types of hazard abatement activities utilized across the ownership: biomass harvesting, burning of slash piles in clearcuts and landings, broadcast burning, and mastication. Biomass harvesting involves the removal of logging debris that typically is piled during active harvesting operations. The debris is removed from the harvesting area and is used as hog fuel rather than being burned on site. Clearcut pile burning is a form of hazard abatement where logging debris is accumulated into piles throughout the harvesting area during or after operations and burned on site during the winter period. Landing pile burning is also a form of hazard abatement where logging debris accumulates on designated landings rather than throughout the harvest unit; the landing piles are subsequently burned during the winter period. Broadcast burning involves a prescribed fire to burn over a designated area with well-defined boundaries to reduce the level of fuels and improve reforestation access. Mastication is mechanical grinding of slash material into small pieces of debris in order to reduce fuel levels and improve reforestation.

With the use of biomass harvesting, hazard abatement operations can be applied to harvest units over multiple reporting periods. Therefore, we summarize these operations separately for all units, regardless of THP completion status, that have been treated within the biennial reporting period. The two types of hazard abatement activities applied to 146 harvest units during the current reporting period were burning of clearcut piles and burning of landing piles (Table 11). There was no mastication, broadcast burning, or biomass harvest activities utilized during the current reporting period. All hazard abatement activities were completed as planned.

Table 11. Summary of hazard abatement activities.

Type of Hazard Abatement	Number of Harvest Units	Total Area of Hazard Abatement Activities (Acres)	Average Area of Hazard Abatement Activities per Harvest Unit (Acres)
Mastication	3	48.8	16.3
Burned Clearcut Piles	126	2,777	22
Burned Landing Piles	16	321	20
Biomass Harvesting	-	-	-
Broadcast Burned	1	21.5	-

Hazard Abatement Exceptions:
There were no Hazard Abatement Exceptions that occurred during the reporting period.

Violations and Other Observations

There were twelve violations associated with the 56 completed harvest plans during the current reporting period. A summary of each notice of violation is listed below.

THP 1-16-140HUM (GDRCo 19-1601):

- Violation per Master Timber Harvesting Operation (MATO), No. 1600-2010-0114-R1 (Measure A.17) Lack of Class I biological surveys and species relocation actions prior to construction. – A temporary crossing was installed at RP 1 without a biological survey. Potential for damage to sensitive species included steelhead, coastal cutthroat trout, foothill yellow-legged frog and northern red legged frog which potentially required fish or amphibian relocation action per MATO Measure A.17.
    - *Outcome* – Given the crossing installation occurred on a relatively small watercourse (approximately 40 feet long by two feet active channel width), the risk of take of the species was low.

THP 1-15-044HUM (GDRCo 24-1401):

- VIOLATION OF 14 CCR 1035.1(a) RPF responsible for accuracy and completeness of THP – The RPF filed for final completion report for Units A, B, E and road points 1-10 & 12. The work required in Unit B referenced as WQ #1 in section II of the plan was not completed or amended out of the harvest document prior to submitting the final completion report.
    - *Mitigation* – The proposed road to access the site was not constructed, as a result the proposed work at WQ #1 was not deemed necessary by the RPF and water quality. No environmental damage occurred.

THP 1-21-019HUM (GDRCo 26-2002):

- Violation per Master Timber Harvesting Operation (MATO), No. 1600-2010-0114-R1 (Measure A.17) Lack of Class I biological surveys and species relocation actions prior to construction. – A crossing was installed at RP 4 without a biological survey and potentially required fish or amphibian relocation action per MATO Measure A.17. Potential risk to sensitive species included; steelhead, coastal cutthroat trout, foothill yellow-legged frog, and northern red legged frog.
    - *Outcome/Mitigation* – Given the crossing installation occurred on a relatively small watercourse (approximately 40 feet long by two feet active channel width), the risk of take of the species was low.

THP 1-23-055HUM (GDRCo 42-2201):

- Violation per California practice rule 14 CCR923.9 Crossing surface drainage – An appurtenant road to the THP was unable to disperse water due to vegetation and debris built up along the edges of the road. The LTO failed to adequately shape and drain the road surface post operations.
    - Mitigation – A mandatory ditch line hydraulic disconnect identified during the inspection from RP3 out to the Fawn Prairie Rd gate shall be mapped and amended in the THP road work order. Work shall be completed by Oct 15, 2024, in conjunction with road shaping and grading. No environmental damage observed.

THP 1-20-016HUM (GDRCo 43-1904):

- Violation per California practice rule 14 CCR1035.3(d) LTO rule compliance – The LTO felled and yarded timber within an RMZ designated in the plan as no harvest. The RMZ was clearly depicted as no harvest on the THP map and appeared to be adequately flagged in the field prior to operations.
    - Mitigation – LTO required to slash pack or mulch area where harvesting equipment disturbed soils within the RMZ. No sediment delivery was observed.

THP 1-21-120HUM (GDRCo 47-2104):

- Violation of 14 CCR 914.7(b) Winter period operating plan requirements – A feller buncher operated by LBA Contract Cutting Inc. operated within the WLPZ during the Winter Period to fell and bunch timber. The harvest plan’s winter period operating plan states: No heavy equipment for harvesting operations within WLPZs.
    - *Mitigation* – The area affected was applied straw and seed.

THP 1-21-087HUM (GDRCo 56-2101):

- Violation per Master Timber Harvesting Operation (MATO) Lake and Streambed Agreement #1600-2010-0144-R1- Class II watercourse culvert crossing – Unstabilized road fill was placed upstream of the culvert

crossing, adjacent to a Class II watercourse, which resulted in approximately 5 cubic yards of sediment delivery between Oct. 15, 2023, and Jan. 17, 2024.
    - *Mitigation* - remove unstable material and apply appropriate erosion control measures to site.

THP 1-21-087HUM (GDRCo 56-2101):

- Violation per California practice rule 14 CCR923.9(i) Fills constructed for logging road watercourse crossings – It was observed that the steep side slopes (65%+) were failing and are not armored appropriately to prevent significant discharge.
    - *Mitigation* - Corrective action shall take place after the winter period. Prior to Oct. 15, 2024, slide slopes shall be laid back and the toe of the slope within the watercourse shall be stabilized to prevent significant discharge.

THP 1-23-074HUM (GDRCo 56-2103):

- Violation per California practice rule 14 CCR923.6(g) Stable operating surface road use in winter period – The LTO walked a shovel logger on a portion of native soil on a seasonal road (roughly 1,000 ft) to access a portion of a harvest unit.
    - *Mitigation* – The LTO and landowner hand dug and repaired water bars and applied straw to the watercourse crossings. No sediment delivery was observed.

THP 1-23-010DEL (GDRCo 71-2201):

- Violation per California practice rule 14 CCR 1035.3(d) LTO rule compliance – On Sept 2, 2024, the LTO felled approximately 12 merchantable trees within an area designated as No Harvest, while conducting hand-falling operations in Unit D of the THP.
    - *Mitigation* - In collaboration with CDFW and GDRCo Botanical Department, the felled trees may be harvested under strict guidance provided in an attached document to the LTO. Trees marked for harvest within the selection buffer associated with the plant protection area shall be retained.

THP 1-20-008DEL (GDRCo 85-1901):

- Violation per California practice rule 14 CCR1035.3(d) LTO rule compliance – On April 7, 2021, harvesting operations occurred within 0.25 miles of an identified Marbled Murrelet habitat. This occurred during an identified critical period which was identified as March 24 through Sept. 15 in Section II (pp 95-96) of the THP.
    - *Mitigation* – Continued operations within 0.25 miles of the Marbled Murrelet area during the critical period is prohibited and additional violations in this matter would result in escalated Forest Practice enforcement actions.

THP 1-22-002HUM (GDRCo 95-2101):

- Violation per California practice rule 14 CCR923.7(a) Maintenance of logging roads and landings to ensure hydrologic disconnection – Inadequate hydrologic disconnection was observed at road points 1, 2, and 3 of the THP resulting in a visible increase in turbidity to Class I and II waters which is an indicator of “Significant Discharge” as defined in 895.1. The road surface drainage structures necessary to sustain a stable operating surface had been compromised by road use and could not effectively disperse road surface runoff prior to entering the watercourse.
    - *Mitigation* - Road surface drainage structures shall be functional prior to the start of the rain that generates overland flow.

III. Land Transactions and Plan Area Adjustments

The AHCP Implementation Agreement (IA) has two distinct requirements involving both the reporting of land transactions as well as the accounting of these transactions as they relate to Plan Area limitations described in the IA.

The following is a description of GDRCo's compliance with Sections 8.2, 11 and 12 of the IA regarding Land Transactions and Plan Area Adjustments and a summary of transactions reported to the Services as required in Section 8.1(c) of the IA.

A. Notice of Transactions

Section 8.2 of the IA requires GDRCo to notify the Services of any transfer of ownership of real property or harvesting rights subject to the AHCP at the time of the transfer of ownership (except where prior notification is required pursuant to IA Section 11 – which is discussed below). To comply with IA Section 8.2, GDRCo has a comprehensive pre-transaction "Notice Approval Record" which provides a routing and approval format for all real property transactions resulting in a change in the Plan Area. GDRCo has an internal policy that the employee responsible for negotiating a proposed transaction involving the acquisition or disposal of land or timber harvesting rights within the Plan Area also is responsible for addressing the effect of the transaction on the AHCP Plan Area and preparation of a pre-transaction notice letter to the Services. Prior to submission of the pre-transaction notification letter, approval is obtained from the Vice President of Green Diamond's California Timberlands Division if the transaction will result in an addition or deletion of Plan Area acres. This notification and approval record provides assurances that the transaction is properly identified as a specific real property transaction and that the required information is documented and submitted to the Services as well as key GDRCo employees. This notification and approval record also ensures that changes to the Plan Area are recorded in GDRCo's Forest Resources Information System (FRIS), which is used to track and report Plan Area changes. Each notification to the Services provides GDRCo's best estimate of the acreage involved in the transaction and the resulting change in the Plan Area. However, the Company relies on FRIS as the official record for calculating, tracking, and reporting Plan Area changes.

The following is a list of transactions that occurred during this reporting period:

a) Korejko
b) Cummings
c) Sullivan
d) R. Cook
e) New Forests
f) Westbrook
g) McKinleyville Community Forest
h) Alito and Suchanek

The results of these transactions on the Plan Area and the 15% cumulative net expansion or contraction limit are provided in Section III.C. below.

B. Land Transactions

1. Plan Area Additions

Section 11.2 of the IA, stipulates that pre-transaction notice letters will be sent to the Services for any acquisition within the Eligible Plan Area that will result in an addition to the Plan Area with a description of the proposed transaction and an assessment of how the transaction will affect the AHCP. Green Diamond will provide any such notices to the Services, which will be approved and result in an automatic addition to the Plan Area unless the Services object within 60 days of notification or the addition would exceed the Plan Area adjustment limits described below. Each notification to the Services provides GDRCo's best estimate of the acreage involved in the acquisition. However, the Company relies on FRIS as the official record for calculating, tracking, and reporting Plan Area changes.

2. Plan Area Deletions

Section 11.3 of the IA provides that any deletion from the Plan Area will be automatically accepted upon notice to the Services unless the deletion would exceed the Plan Area adjustment limits described below or GDRCo seeks special consideration for the Plan Area deletion so that it is not counted against the Plan Area adjustment limits.

3. Limitations on Plan Area Transactions

As described in Section 11 of the IA, the Plan Area may not expand or contract by more than 15% of the Initial Plan Area (406,962 acres) without an amendment to the AHCP or Permits. Green Diamond may purchase and divest properties without amending the AHCP as long as the cumulative net acreage effect does not result in a Plan Area increase or decrease of more than 61,044 acres.

There are exceptions and qualifiers related to this general limitation outlined in Section 11 of the IA. Section 11.3 of the IA requires a pre-transaction notice and determination by the Services in instances where GDRCo will remove covered lands or timber harvesting rights from the Plan Area and GDRCo seeks confirmation that the deletion from the Plan Area will not be counted against the cumulative net acreage change in the Plan Area because the Services find that the new owner will manage the transferred property under enforceable conditions that will not compromise the effectiveness of the AHCP. In these instances, GDRCo will provide the Services with a pre-transaction notice that includes a justification for the exemption and GDRCo's best estimate of the acreage involved in the transaction and the resulting change in the Plan Area. The Services will provide GDRCo with a response and GDRCo will ensure that the Plan Area adjustment is accurately recorded in FRIS as a change in the Plan Area that does or does not count against the limitation on the cumulative net increase or decrease in the Plan Area.

4. Minor Modifications to the Plan Area

Under IA Section 12.1, Minor Modifications to the Plan Area may occur due to ownership acreage corrections that are not associated with a real property transaction. An example of these minor adjustments are property line boundary changes that integrate real world coordinate information from recent land surveys into the GIS system and correcting the location of property lines accordingly. Another example would be a mapping error correction identified during routine GIS work. The Initial Plan Area (406,962 acres) will be used for the duration of the AHCP Period to calculate the 15% cumulative, net expansion or contraction limitations based on transactions, but Minor Modifications will not change the Initial Plan Area in that they are, by definition, minor and would not affect operations under the AHCP or the Covered Species.

These minor acreage adjustments can fluctuate up or down during any one year and during the term of the AHCP, therefore GDRCo will identify and account for these specific adjustments using FRIS. This biennial report serves as the notification to the Services of these Minor Modifications to the Plan Area. A summary of the Minor Modifications to the Plan Area such as property line boundary changes and GIS corrections are provided in Table 12 below.

C. Summary of Land Transactions and Plan Area Adjustments

The current AHCP Plan Area consists of 363,222 acres (Table 12). As a result of Plan Area additions, deletions and minor modifications that occurred from January 1, 2023 through December 31, 2024 there was an increase of 3,779.7 acres to the current Plan Area reported in the 8th Biennial Report. Since the approval date of the AHCP, there has been a decrease of 43,740 acres in the AHCP Plan Area, with a net contraction of 21,134 acres due to non-comparable transferee transactions. The remaining decrease in acreage is accounted for in land transactions with comparable transferees as well as minor modifications to the Plan Area.

Table 12. Summary of land transactions and minor modifications that occurred between January 1, 2023 and December 31, 2024.

Property Transactions	Does the Transaction Affect the Plan Area?	Direction of Plan Area Change (+ / - / None)	GIS Transaction Area (Acres)	Plan Area Adjustment (Acres)	Does the Transaction Affect the 15% Limit?
Plan Area Additions					
Korejko (a)	Yes	(+)	16.0	16.0	Yes
Cummings (b)	Yes	(+)	285.6	285.6	Yes
Sullivan (c)	Yes	(+)	6.5	6.5	Yes
R. Cook (d)	Yes	(+)	37.0	37.0	Yes
New Forests (e)	Yes	(+)	4060.0	4060.0	Yes
Total			**4405.1**	**4405.1**	
Plan Area Deletions					
Korejko (f)	Yes	(-)	0.9	-0.9	Yes
Westbrook (g)	Yes	(-)	5.7	-5.7	Yes
McKinleyville Community Forest (h)	Yes	(-)	598.3	-598.3	Yes
Alito & Suchanek (i)	Yes	(-)	3.0	-3.0	Yes
Sullivan (j)	Yes	(-)	17.5	-17.5	Yes
Total			**625.4**	**-625.4**	
Minor Modifications					
			n/a	n/a	
			Total	**3779.7**	

	Total (Acres)
Initial Plan Area	406,962
Current Plan Area (as of 12/31/2024) (k)	363,222
15% of Initial Plan Area (l)	61,044
Net Expansion (+) / Contraction (-) Acreage	-21,134

(a) Notice of the Korejko transaction was provided to the Services in a letter dated April 1, 2024. The transaction included the acquisition of commercial timberland in fee.
(b) Notice of the Cummings transaction was provided to the Services in a letter dated January 3, 2024. The transaction included the acquisition of commercial timberland in fee.
(c) Notice of the Sullivan transaction was provided to the Services in a letter dated April 20, 2023. The transaction included the purchase of commercial timberland in fee.
(d) Notice of the R. Cook transaction was provided to the Services in a letter dated February 14, 2023. The transaction included the acquisition of commercial timberland in fee.
(e) Notice of the New Forests transaction was provided to the Services in a letter dated January 31, 2023. The transaction included the acquisition of commercial timberland in fee.
(f) Notice of the Korejko transaction was provided to the Services in a letter dated April 1, 2024. The transaction included the disposition of commercial timberland in fee.
(g) Notice of the Westbrook transaction was provided to the Services in a letter dated February 12, 2024. The transaction included the disposition of real property to Westbrook.
(h) Notice of the McKinleyville Community Forest transaction was provided to the Services in a letter dated February 5, 2024. The transaction included the disposition of real property to McKinleyville Community Forest.
(i) Notice of the Alto and Suchanek transaction was provided to the Services in a letter dated November 2, 2023. The transaction included the transfer of real property to Alto and Suchanek .

(j) Notice of the Sullivan transaction was provided to the Services in a letter dated April 20, 2023. The transaction included the disposition of real property to Sullivan.
(k) Reported acreage adjustments to the Initial Plan Area are rounded to the nearest whole acre.
(l) The expansion or contraction limit relative to the Initial Plan Area (406,962 acres) without an amendment to the Plan or Permits. There are exceptions and qualifiers related to this limitation outlined in Section 11 of the IA.

IV. AHCP Training Programs

As specified in AHCP Section 6.2.3.14, training is required for all company and contract equipment operators and supervisors involved with the Road Implementation Plan along with RPFs and forestry technicians involved with road design, layout and development of road treatment prescriptions. The training is offered annually as necessary for new employees or new contractors. Refresher training courses on the Road Management Plan are provided as needed to review concepts, introduce any new state-of-the-art techniques, and to present any new relevant regulatory information.
As specified in AHCP Section 6.2.2.5, training will be administered by a qualified PG or CEG to all RPFs that write THPs to review issues related to the AHCP Slope Stability Measures. The purpose of the training is to help RPFs identify and more fully understand the slope stability measures as well as the possible implications of various timber management scenarios for landslides and other unstable areas. The training is offered annually to accommodate new contractors and new employees. Refresher training courses are provided as necessary to employees and contractors to present new relevant scientific or regulatory information.

A. 2023 Training Programs

Similar to the previous years, GDRCo employees met on several days with individual contractors during the late spring of 2023 to review the content of the training binder which contains general company safety procedures as well as HCP training materials that we typically review collectively at the breakfast meeting. The standard road related topics we review are road cost tracking, water drafting and general road treatment procedures. The Aquatics group in combination with the AHCP roads department conducted two trainings in 2023 covering the Aquatics program, current permits, watercourse classifications, wet area designation Potential Unique Amphibian Habitat (PAHS) and watercourse crossings. Table 13 summarizes the AHCP related training programs held in 2023.

Table 13. Summary of 2023 training programs.

Training Dates	Groups	AHCP and Goelogy Training	PAHS (Potential Unique Amphibian Habitat) Training	General Road Management Measures	Road Design and Layout	Road Upgrading, Decommissioning, Maintenance, and Construction Standards
18-Jan	Forestry		X			
Late spring	Contract operators	X		X	X	X
19-May	Company supervisors, employees, RPFs, forestry technicians, operations	X	X	X	X	X
24-May	Company supervisors, employees, RPFs, forestry technicians, operations	X	X	X	X	X
7-Jun	Forestry		X			

B. 2024 Training Programs

2024 was the first time since 2019 and the COVID pandemic that GDRCo held a contractor breakfast in spring and additionally met on several days with individual contractors during the spring and early summer of 2024 to review the content of the training binder which contains general company safety procedures as well as HCP training materials. The standard road related topics we review are road cost tracking, water drafting and general road treatment procedures. The Aquatics group in combination with the AHCP roads department conducted 1 training in 2024 covering the Aquatics program, current permits, watercourse classifications, wet area designation Potential Unique Amphibian Habitat (PAHS) and watercourse crossings. The company Professional Geologist conducted 1 training in 2024 covering worker safety when conducting road activities in areas proximal to rock types containing asbestos and general forest geology topics. Table 14 summarizes the AHCP related training programs held in 2024.

Table 14. Summary of 2024 training programs.

Training Dates	Groups	AHCP and Goelogy Training	PAHS (Potential Unique Amphibian Habitat) Training	Class II/III Training	General Road Management Measures	Road Design and Layout	Road Upgrading, Decommissioning, Maintenance, and Construction Standards
6-Feb	Forestry		X				
25-Mar	Forestry			X			
22-Apr	LTO's, Contractors and Contract operators	X			X	X	X
16-Apr	Company supervisors, employees, RPFs, forestry technicians, operations	X	X		X	X	X
3-May	Company supervisors, employees, RPFs, forestry technicians, operations	X					
13-Nov	Forestry		X		X		

V. Road Management Measures

The principal purpose of the Road Management Measures (AHCP Section 6.2.3) is to eliminate major sources of sediment discharges into watercourses from roads. The objective of the Road Implementation Plan (AHCP Section 6.2.3.2) is to carry out a systematic road upgrade and decommissioning program using a road assessment and prioritization system (AHCP Section 6.2.3.1) that will maximize sediment reduction and conservation benefits within the Plan Area for the Covered Species. To achieve additional conservation benefits from this effort, the Road Implementation Plan had an acceleration period for the first 13.5 years of the Plan; GDRCo provided for an average of $2.5 million (inflation adjusted to 2002 dollars) each year of the acceleration period to carry out the upgrade and decommissioning program. The acceleration period ended in 2020 and GDRCo is no longer required to provide a specific annual amount towards the Road Implementation Plan. The work to be done and the sediment savings to be achieved by the Road Implementation Plan are tied to the results of the Road Assessment Process. The main objective of the Road Maintenance Program (AHCP Section 6.2.3.9) is to ensure that the sediment saving conservation benefits of the road upgrading program are maintained throughout the life of the Plan after the roads are upgraded.

A. Programmatic Road Permits

On June 10, 2010, NCRWQCB adopted Road Management Waste Discharge Requirements (RMWDR: Order No. R1-2010-0044) and on June 15, 2010, CDFW issued a Master Agreement for Timber Operations (MATO: No. 1600-2010-0114-R1) that would allow GDRCo to conduct road activities related to the AHCP Road Implementation Plan and the Road Maintenance and Inspection Program. These agreements allow GDRCo to notify CDFW and NCRWQCB of all planned watercourse crossing activities on an annual basis through an Annual Work Plan report. There is an initial 60-day review period, with methods to revise and update the plan throughout the operating season.

The acquisition of the programmatic permits also significantly changed the approach to assessing roads for THPs. Prior to acquiring the permits, roads were assessed and treated according to the “fully functional” concept per THP. This concept forced mitigation efforts and treatment on a wide spectrum of issues and sediment introduction risk levels such as diversion potential, presence of erosion, blockages of inlets and outlets, lack of hydrological disconnection, and pipe integrity. Through discussions with NMFS, USFWS, CDFW, NCRWQCB, and CalFire a streamlined approach to road assessment was developed, approved, and implemented as part of the programmatic permits. This approach is referred to as the “Imminent Risk of Failure” concept and uses six general elements of watercourse crossings within a decision tree to guide road assessment. The assessor follows this decision tree to conclude whether a crossing should be upgraded or decommissioned, monitored, or deferred for mitigation. The primary reason for this approach is to focus mitigation efforts on sites which have the highest potential risk of significant sediment delivery in a property-wide approach rather than on a THP-by-THP basis and to utilize and fully implement the Routine Road Maintenance and Inspection Plan set forth in AHCP Section 6.2.3.9.

During the first year of implementing the “Imminent Risk of Failure” concept, issues arose during pre-harvest inspections. The primary issue was the interpretation of the decision tree during assessment of crossings. These interpretations varied from the determinations made by Forest Operations Technicians responsible for completing road work orders in THPs and the agency representatives who inspect the THPs for consistency and regulatory compliance. As a result of these issues, an Imminent Risk of Failure Intent Document was created which discusses each section of the key including a description and diagnosis of the issues and what appropriate mitigation measures to apply. The document was circulated within GDRCo, CalFire, CDFW and NCRWQCB for input and suggested revisions. Once the document was finalized it was distributed to GDRCo staff and all field agency representatives to help establish a consistent evaluation and interpretation of road-related mitigation measures. Since this distribution issues during pre-harvest inspections have been minimized. The Intent Document will be revised as needed to reflect new techniques and issues as they arise.

The 2023 Annual Work Plan included road sites for 62 THPs or THP amendments, 14 sites related to Routine Maintenance Area #1, 2 sites related to routine mainline road maintenance, and Stream and Floodplain Enhancement grant projects in Hunter Creek and Terwer Creek.

The 2024 Annual Work Plan included road sites for 44 THPs or THP amendments, 14 sites related to Routine Maintenance Area #1, 8 sites related to routine mainline road maintenance, and 1 Stream and Floodplain Enhancement grant project in Ah Pah Creek, and 12 permanent Wet/Dry Class I Fording Sites.

B. Road Assessment Process

Road assessments are conducted using a standardized protocol which addresses site priority and volume of potential sediment delivery. Site priority is assigned based on volume of potential sediment delivery, treatment immediacy, and overall cost-effectiveness of the proposed treatment. Volume of potential sediment delivery is calculated using a systematic approach of cross-sectional analysis of stream crossing fill prisms. The “Imminent Risk of Failure” concept has allowed an even greater level of standardization as well as consistent treatment prescriptions in THPs and work required within the Routine Maintenance Areas and for mainline road assessments.

In 2009, GDRCo successfully completed the consolidation of all previous road assessments into a single, useable database. Database reporting tools were added to the database which allows the AHCP Roads Coordinator to analyze and publish data to support other AHCP working groups, operational staff, and various regulatory requirements. In 2011, a project was completed to increase the accuracy of the spatial database link through the process of correcting GIS points to LiDAR corrected road and stream data as well as digitizing data from paper maps. Further refinements to the database were completed in 2014 to increase speed and incorporate new tools to allow for more accurate and time saving processes. No significant changes to the road data in TMIS are planned in the future.

Accurate identification of road-related erosion sites and the application of prioritized treatment by qualified personnel is a fundamental process of AHCP Section 6.2.3.1. The transition from RPFs conducting road assessments to the AHCP Roads department conducting the assessments was completed in early 2009. Presently, Forest Operations Technicians assess all THPs within the AHCP Plan Area to ensure consistency and compliance with all requirements in AHCP Section 6.2.3. In addition, these technicians attend PHIs and assist RPFs during the THP review process. Consolidating and coordinating the road assessment process through the AHCP Roads department ensures accurate operational planning and compliance with AHCP, WDR and MATO standards as well as maintaining consistency between THPs and providing efficient calculations of required statistics.

As mentioned above GDRCo obtained programmatic road permits from CDFW and the NCRWQCB to conduct road-related activities associated with the AHCP Road Management Plan. Assessment and road treatment work to date has occurred concurrently with THP activities and within the Routine Maintenance Areas associated with the Routine Road Maintenance and Inspection Plan (AHCP Section 6.2.3.9). This effort has allowed GDRCo to implement the "Imminent Risk of Failure" concept described above and focuses resources on sites that have the highest potential risk of failure.

C. Road Implementation Plan

The Road Implementation Plan (AHCP Section 6.2.3.2) is the natural extension and completion of a process GDRCo started in 2001 to address sediment-related issues associated with roads on the Plan Area landscape. Beginning in 2000, State agencies involved with reviewing THPs began mandating substantial road improvements on appurtenant haul routes. These road upgrading activities mirror the type of upgrading requirements that were adopted and included within the AHCP and became one of the AHCP's focal points.

During the 2011 Annual Meeting, the Services requested that GDRCo provide a summary of road work in the biennial reports that distinguish between sites completed in conjunction with THP operations and completed outside the THP process (e.g. non-THP maintenance activities and grant-related activities). Table 15 summarizes these data for 2023 and 2024. Table 16 summarizes the number of sites and volume of sediment associated with treating high and moderate priority sites, for each operating area, from 2007 through 2024. Figures 1-14 show the locations of the high and moderate priority sites that were treated from 2007 through 2024.

Table 15. Summary of the number of sites and volume of sediment savings from treating high and moderate priority sites, by operating area, from 2023 through 2024.

Year	Metric	Korbel THP(1)	Klamath THP(2)	Korbel Non-THP(3)	Klamath Non-THP(4)	Korbel GDRCo Grant Contribution(5)	Korbel Grant Sources(6)	Klamath GDRCo Grant Contribution(7)	Klamath Grant Sources(8)	Total
2023	Number of Sites	36	32	0	7	-	-	-	-	75
	Volume (cu. Yds.)	5,816	6,074	0	2,872	-	-	-	-	14,762
2024	Number of Sites	84	96	0	0	-	-	-	-	180
	Volume (cu. Yds.)	24,928	23,477	0	0	-	-	-	-	48,405
2023-2024	Number of Sites	175	184	38	23	-	-	-	-	420
	Volume (cu. Yds.)	33,160	37,126	47,827	8,569	-	-	-	-	126,682

1 THP related road sites within the Korbel operating area which is the geographical area south of the Bald Hills Road which intersects Highway 101 at Orick.

2 THP-related road sites within the Klamath operating area which is the geographical area north of Bald Hills Road which intersects Highway 101 at Orick.

3 Non-THP related road work for Routine Maintenance Area #3 and mainline roads within the Korbel operating area. No grant funding is associated with Non-THP work.

4 Non-THP related road work for Routine Maintenance Area #3 and mainline roads within the Klamath operating area. No grant funding is associated with Non-THP work.

5 Dollars GDRCo provided for as direct cost share (cash) to grant-related projects in the Korbel operating area.

6 Funding for grant-related road work within the Korbel operating area with sources from the Fisheries Restoration Grant Program (CDFW).

7 Dollars GDRCo provided for as direct cost share (cash) to grant-related projects in the Klamath operating area.

8 Funding for grant-related road work within the Klamath operating area with sources from the Fisheries Restoration Grant Program (CDFW), the Yurok Tribe, USFWS or EPA.

Table 16. Summary of the number of sites and volume of sediment savings from treating high and moderate priority sites, from 2007 through 2022.

Year	Metric	Korbel(1)	Klamath(2)	Total
2007-2024	Number of Sites	2,270	1,711	3,981
	Volume (cu. Yds.)	610,952	674,637	1,285,589
2023-2024	Number of Sites	120	135	255
	Volume (cu. Yds.)	30,744	32,423	63,167

1 Korbel operating area is the geographical area south of the Bald Hills Road which intersects Highway 101 at Orick.

2 Klamath operating area is the geographical area north of Bald Hills Road which intersects Highway 101 at Orick.

AHCP Section 6.2.3.2.2 required a Five-year Assessment of Future Sediment Yield at the end of the first five-year period. The intent of this assessment was to evaluate and potentially revise the preliminary sediment savings estimate of 6,440,000 cubic yards from treating high and moderate priority road sites. The results of this study were submitted to the Services on December 20, 2013, per AHCP Section 6.2.3.2.3. The letter submitted to the Services with the complete results was included in the 4th AHCP Biennial Report (GDRCo 2015). The results of this study indicated that the refined estimate is 30.5% less than the original estimate which exceeded the maximum allowed reduction for the Acceleration Period; therefore, the Acceleration Period was reduced by the maximum allowable adjustment of 1.5 years with a corresponding spending reduction of \$3.75 million. To reflect this result, the Acceleration Period was revised to 13.5

years with $33.75 million (to be inflation-adjusted in 2002 dollars for each year of the acceleration period) provided by GDRCo over this period.

As shown in Table 17, the total amount that GDRCo has provided through 2020 is $40.276 million; therefore, GDRCo met the spending requirement in year 13 of the 13.5-year Acceleration Period. With the Acceleration Period spending requirement being met in 2020, there is no longer an average annual spending target or need to forecast or report the annual road expenditures for high or moderate priority road sites

D. Road Maintenance and Inspection Plan

AHCP Section 6.2.3.9 specifies the road maintenance and inspection plan. The Services approved a minor modification of the schedule for the Routine Maintenance Areas (RMAs) as well as the schedule for mainline roads (See Section II.D.3.) Road inspections were conducted in accordance with the process outlined in AHCP Section 6.2.3.9.5 and the approved minor modifications. The rotating annual schedule of the RMA is defined in distinct sections covering the entire Plan Area. The AHCP Roads Department is responsible for surveying the non-appurtenant roads and the roads appurtenant to THPs.

Table 17. Actual Gross Domestic Product (GDP) Price Index inflation rates published by the Bureau of Economic Analysis including actual expenditures by year for treating high and moderate priority road sites during the acceleration period, 2007-2020.

	Base	Actual [1]														
Year	2002	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
GDP Price Index (% change from preceeding period)	0.00%	2.71%	1.88%	0.66%	1.21%	2.07%	1.88%	1.77%	1.86%	0.96%	1.00%	1.93%	2.40%	1.77%	1.30%	
Cumulative Inflation Rate (2002 Base)	0.00%	14.37%	16.52%	17.29%	18.70%	21.16%	23.44%	25.62%	27.96%	29.19%	30.48%	32.99%	36.18%	38.59%	40.40%	
																Totals
Required Average Annual Spending in 2002 $ ($MM)		$ 0 [2][3]	$2.50	$2.50	$2.50	$2.50	$2.36 [4]	$2.30 [4]	$2.97 [4]	$2.25 [4]	$2.25 [4]	$2.20 [4]	$2.20 [4]	$2.20 [4]	$2.20 [4]	$30.93
Required Average Annual Spending After Adjusting for Inflation Using 2002 as Base ($MM)		$ 0	$2.91 [5]	$2.93	$2.96	$3.03	$2.91	$2.89	$2.94	$2.91	$2.93	$2.92	$2.99	$3.05	$3.09	$35.55
Actual and Budgeted Spending by year ($MM)		$1.676	$4.073	$1.171	$2.179	$4.710	$3.966	$3.346	$3.468	$3.396	$2.336	$1.910	$1.914	$2.480	$3.650	$40.276

(1) The Bureau of Economic Analysis has revised the "Actual" GDP Price Index values that were reported in the last Biennial Report (See page 1-7 in the following methodology paper: http://www.bea.gov/national/pdf/NIPAch1-4.pdf).
(2) Reflects the AHCP Minor Modification to the acceleration period to have funds be measured on a calendar year
(3) Reflects the AHCP Minor Modification to the acceleration period to have funds provided for the 3-year ramp-up period begin on the effective date of the Plan through the end of the third calendar year.
(4) Reflects the revised annual spending requirement based in the proportional adjustment in the current Plan Area in relation to the Initial Plan Area, as per IA Section 7.2 and AHCP Section 6.2.3.2.1 #4.
(5) Beginning $2.5MM at 2002 base inflation.

Intermittently, throughout2023 and 2024 inspections of non-appurtenant roads were conducted, focusing on the identification and treatment of “active erosion sites” and others related to compliance with the AHCP. Any sites identified for treatment were scheduled in the 2023 and 2024 AWP. Throughout 2023 and2024 AHCP Roads Technicians surveyed mainline roads and appurtenant roads associated with THP development.

Assessment of RMA #1 began in late 2022 (the first year of the RMA cycle began in 2023) and was completed in 2024. This area consists of Smith River, Coastal Klamath North, Little River, and Mad River. Sites associated with RMA #1 were permitted in the 2023 and 2024 Annual Work Plans and are expected to be completed by October 2025. Assessment of the Wilson Creek RWU and Tectah Creek RWU began in 2022 and continues in 2025.

Figure 1. Location of High and Moderate priority road sites treated from 2007-2024 in the Smith River area.

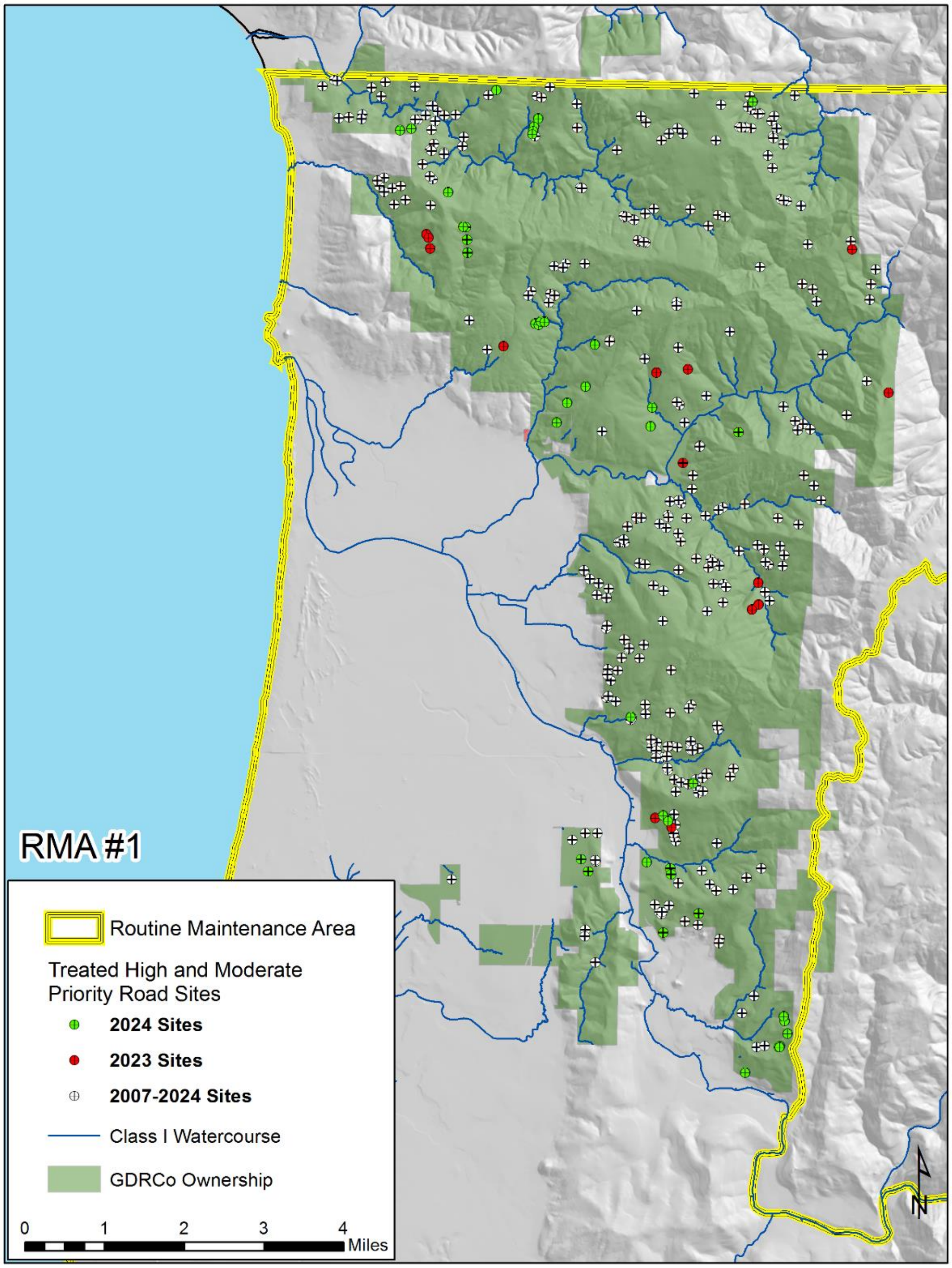


Figure 2. Location of High and Moderate priority road sites treated from 2007-2024 in the Coastal Klamath North area.

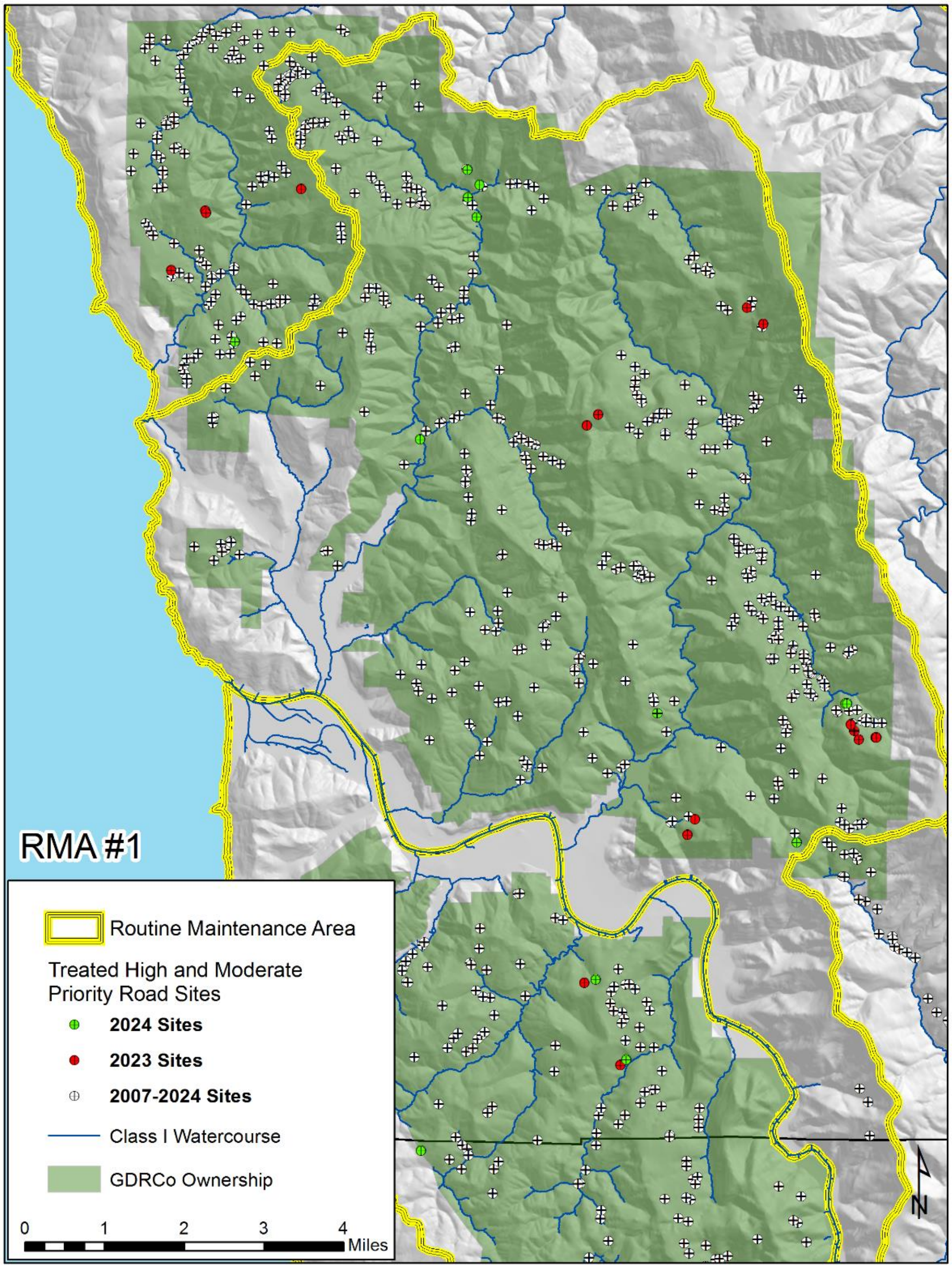


Figure 3. Location of High and Moderate priority road sites treated from 2007-2024 in the Little River area.

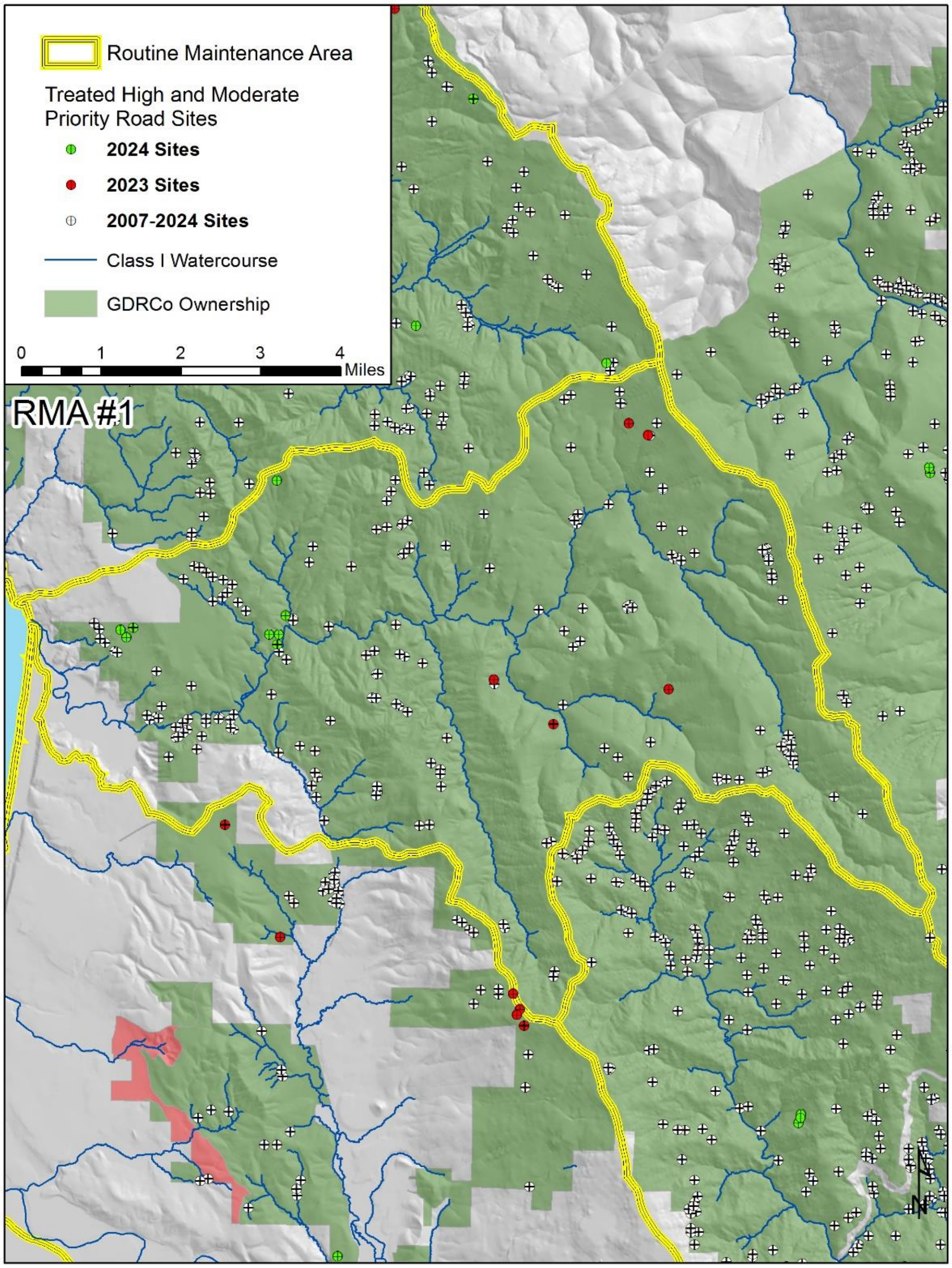


Figure 4. Location of High and Moderate priority road sites treated from 2007-2024 in the Mad River area.

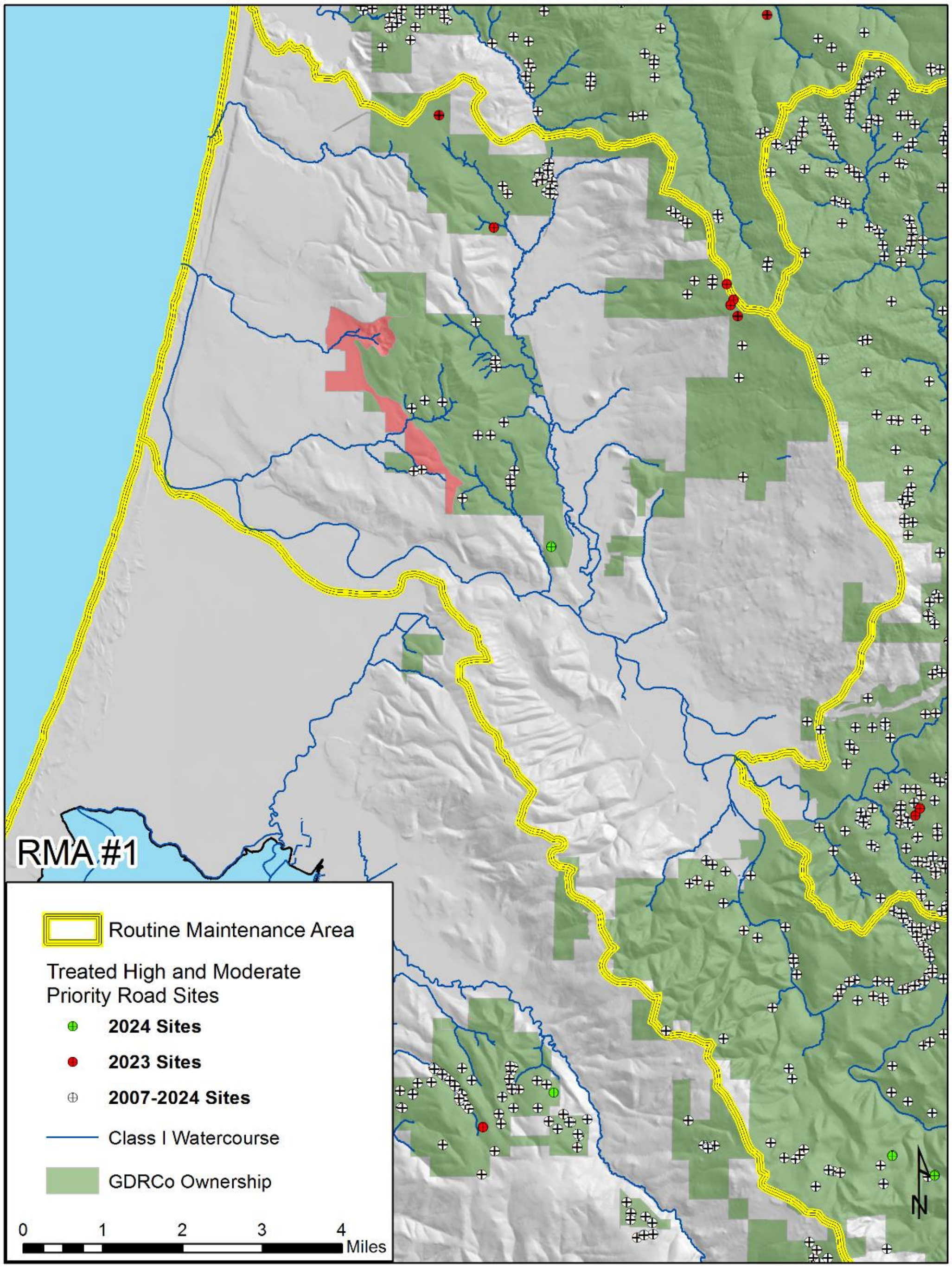


Figure 5. Location of High and Moderate priority road sites treated from 2007-2024 in the Mad River area.

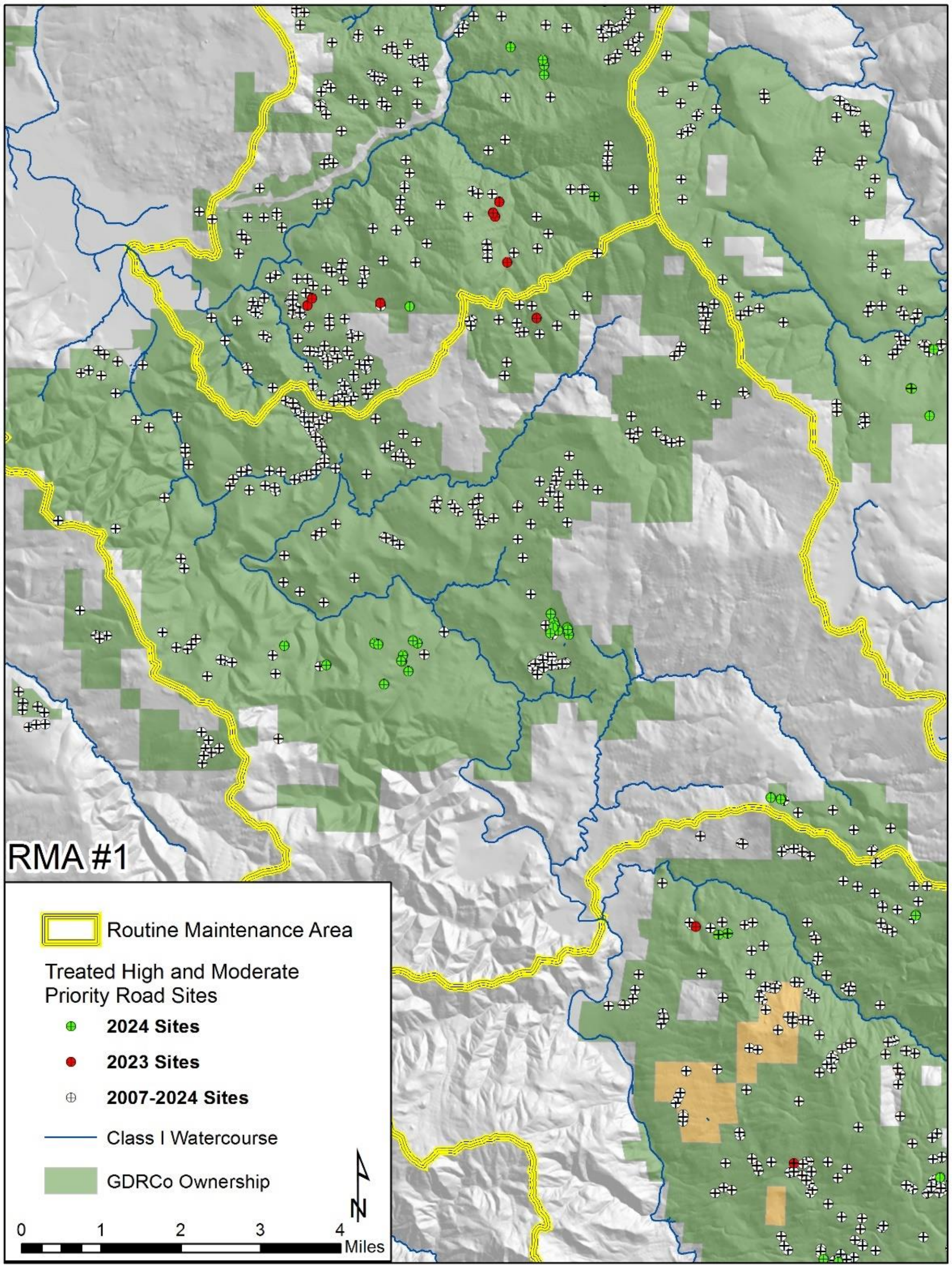


Figure 6. Location of High and Moderate priority road sites treated from 2007-2024 in the Coastal Klamath South area.

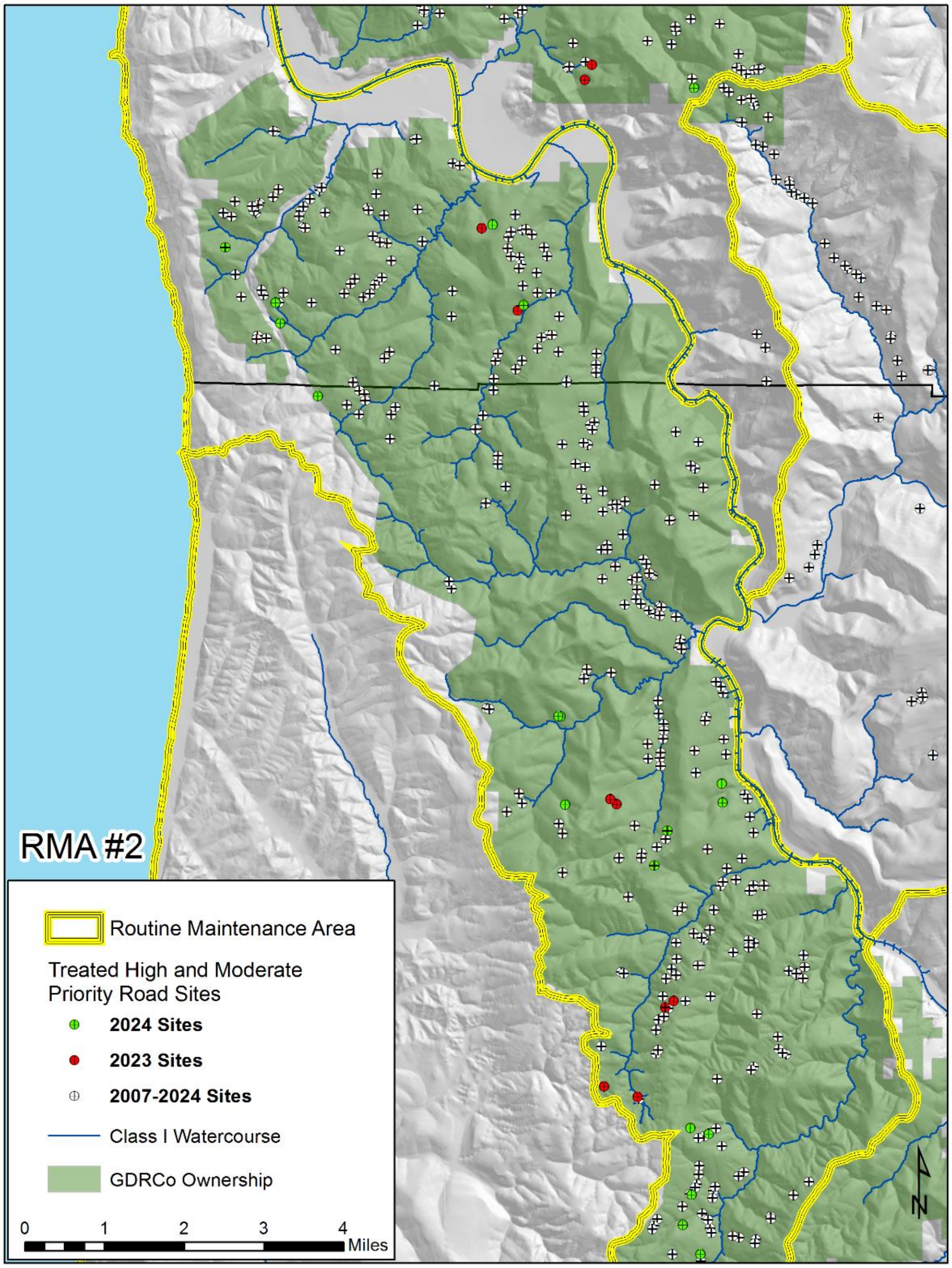


Figure 7. Location of High and Moderate priority road sites treated from 2007-2024 in the Coastal Klamath South area.

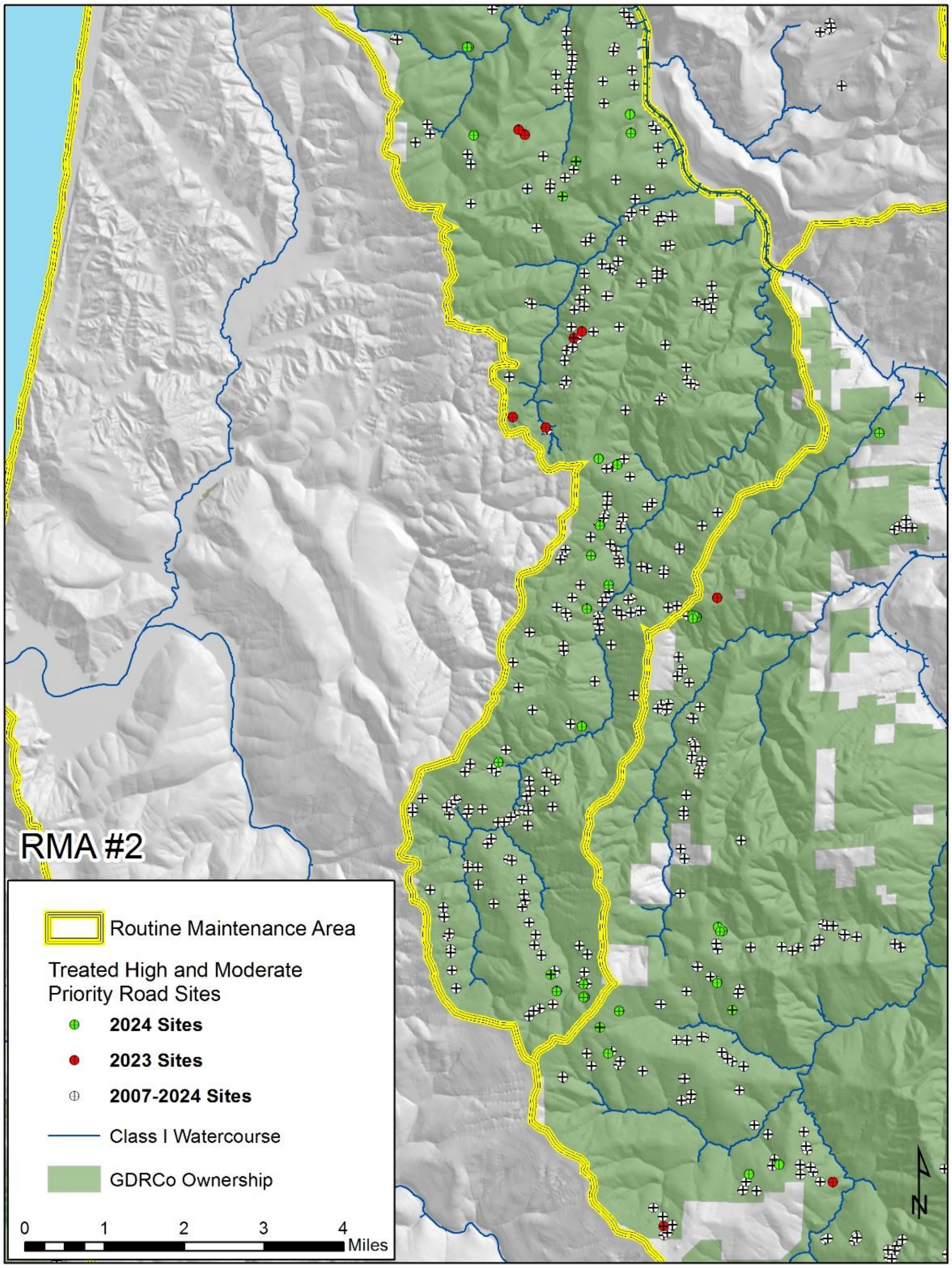


Figure 8. Location of High and Moderate priority road sites treated from 2007-2024 in the North Fork Mad River area.

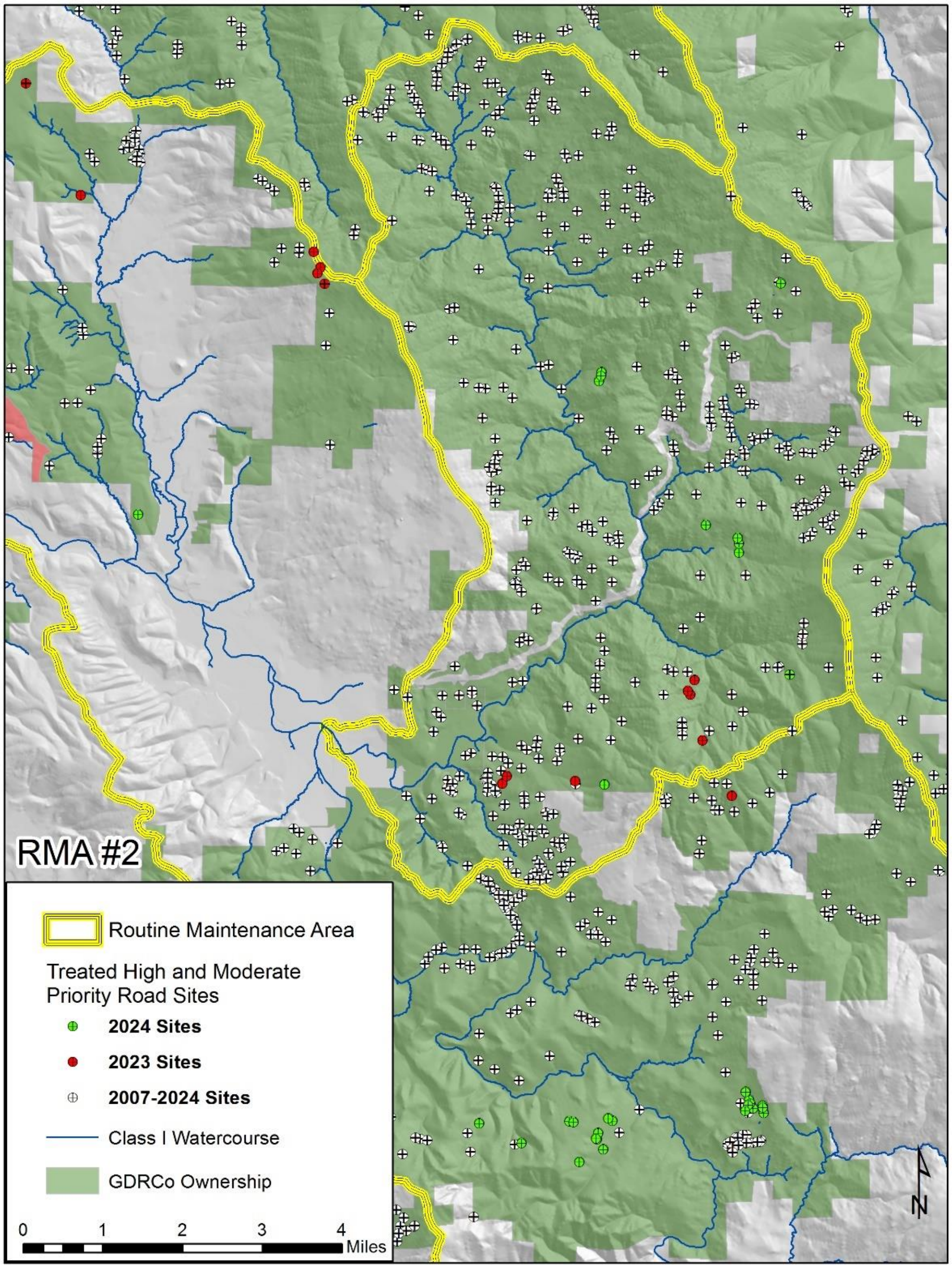


Figure 9. Location of High and Moderate priority road sites treated from 2007-2024 in the Coastal Lagoons area.

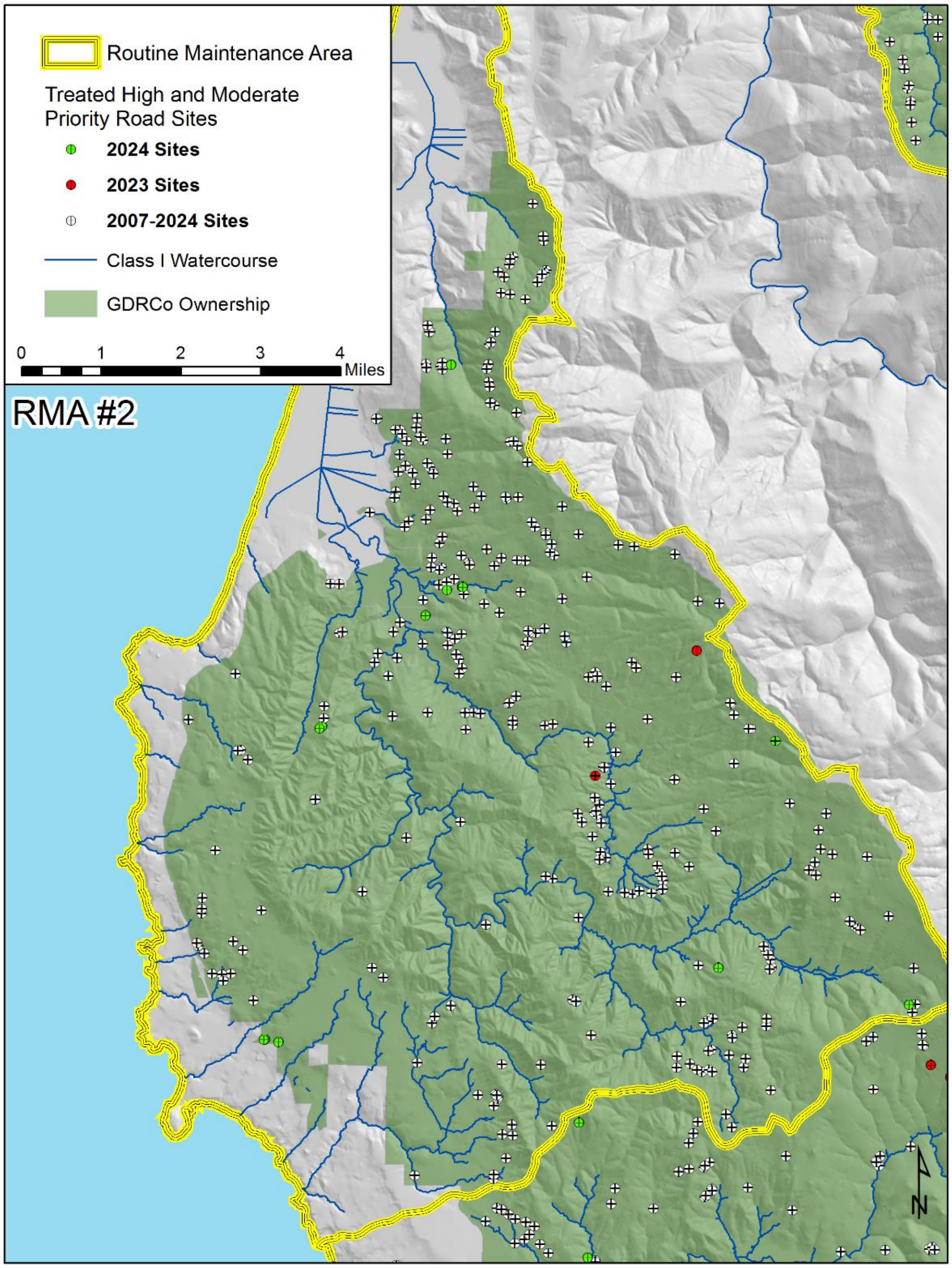


Figure 10. Location of High and Moderate priority road sites treated from 2007-2024 in the Interior Klamath area.

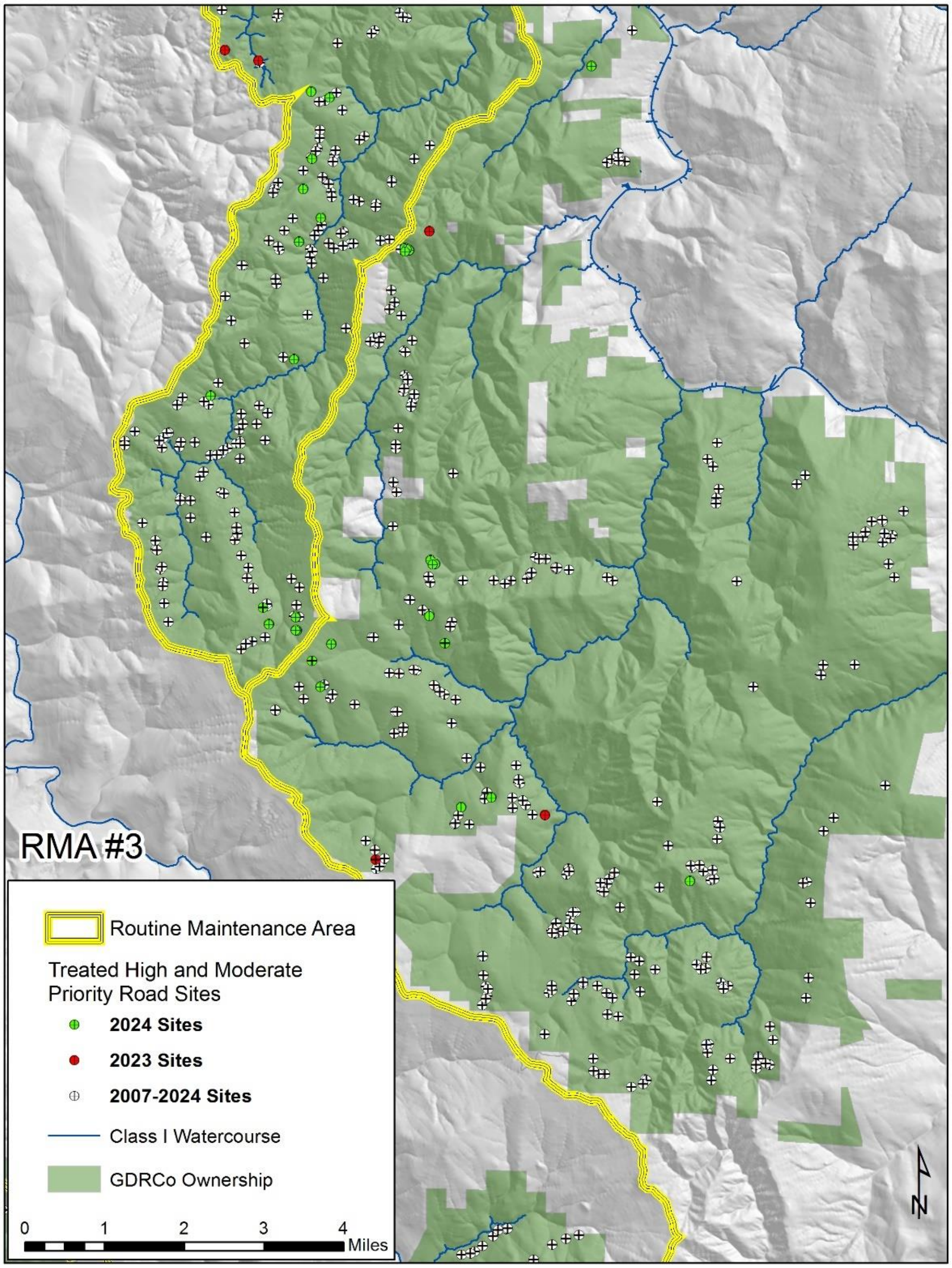


Figure 11. Location of High and Moderate priority road sites treated from 2007-2024 in the Redwood Creek and Humboldt Bay areas.

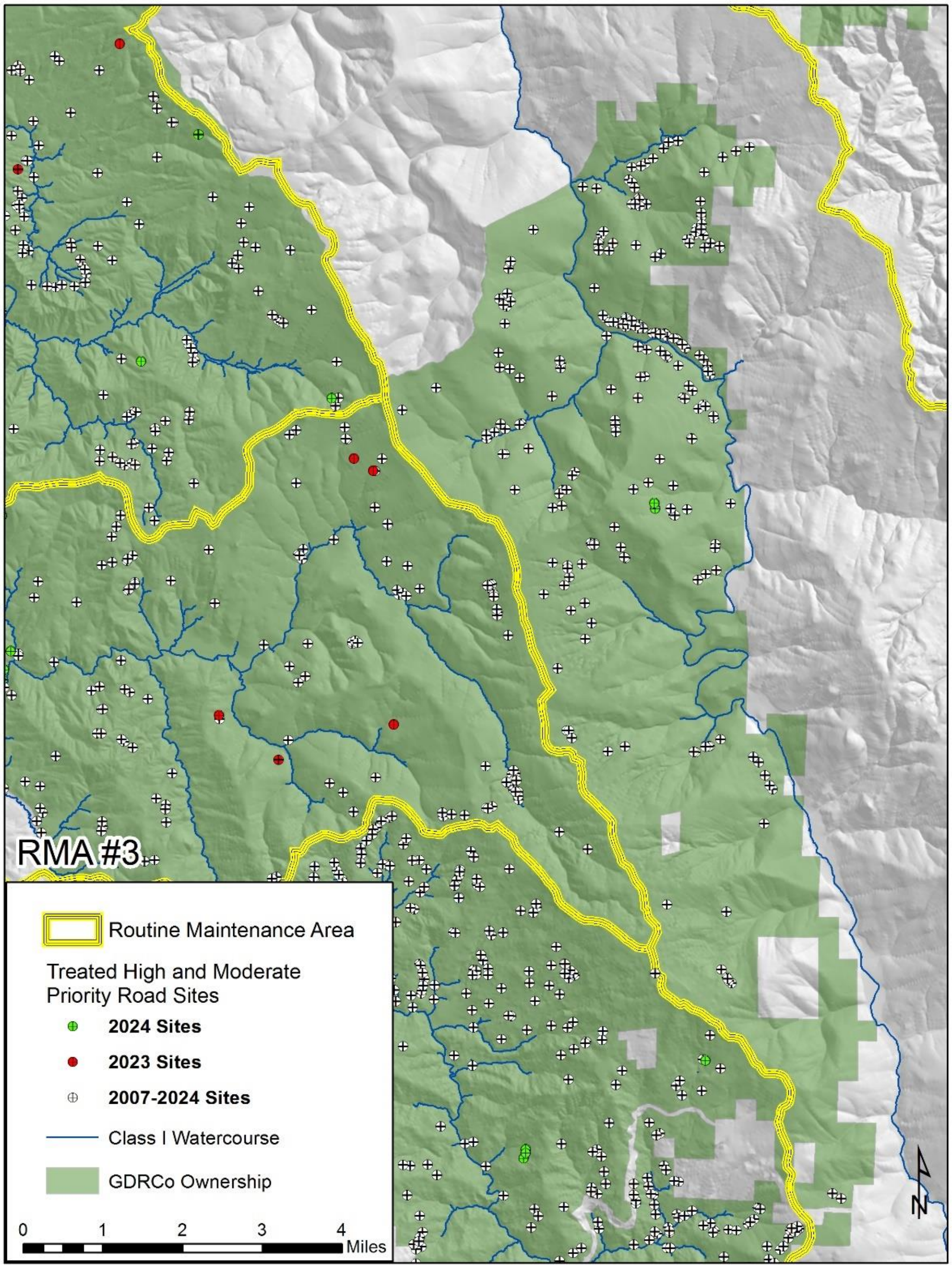


Figure 12. Location of High and Moderate priority road sites treated from 2007-2024 in the Boulder Creek area of the Mad River.

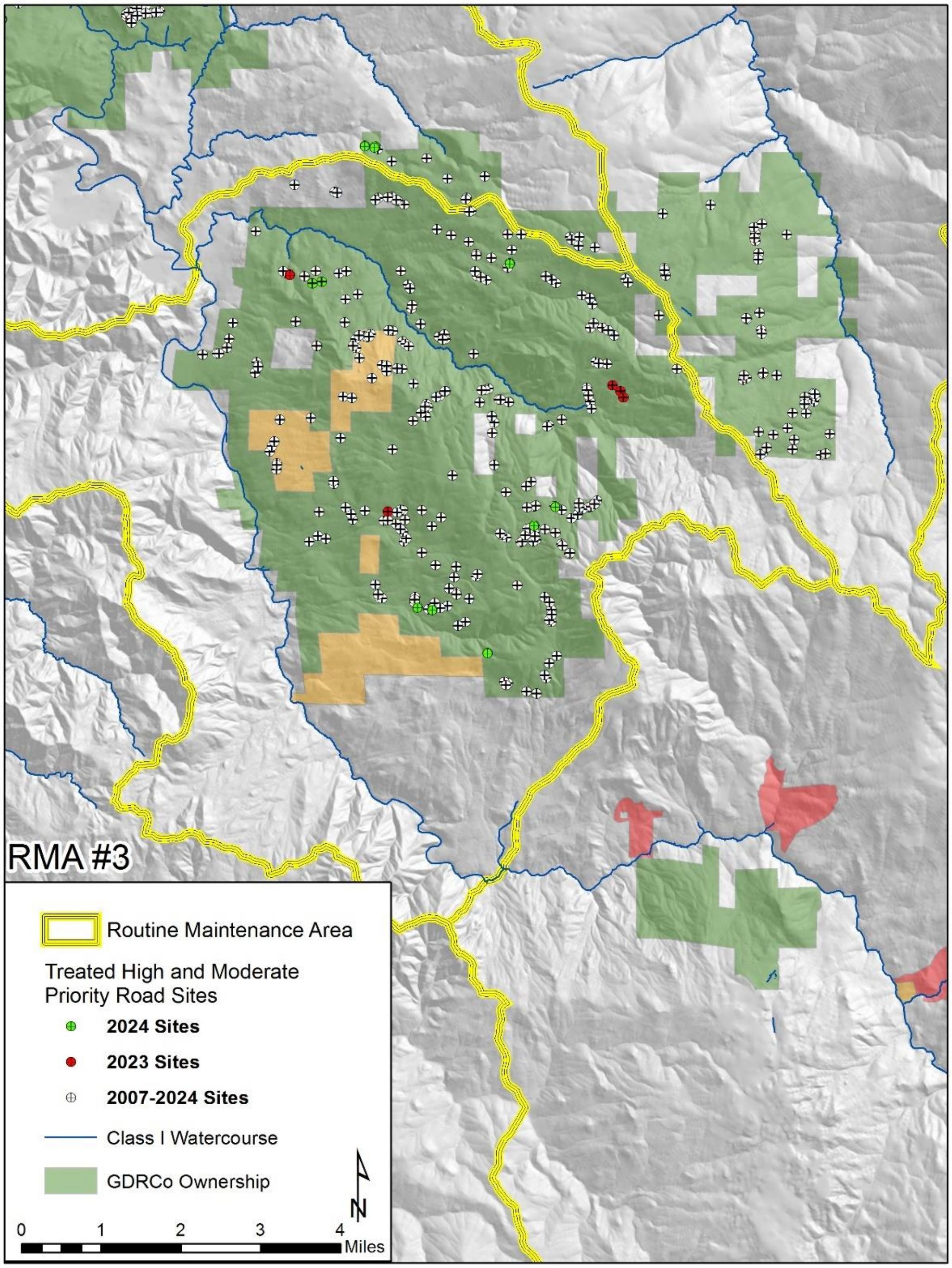


Figure 13. Location of High and Moderate priority road sites treated from 2007-2024 Ryan Creek and Salmon Creek areas.

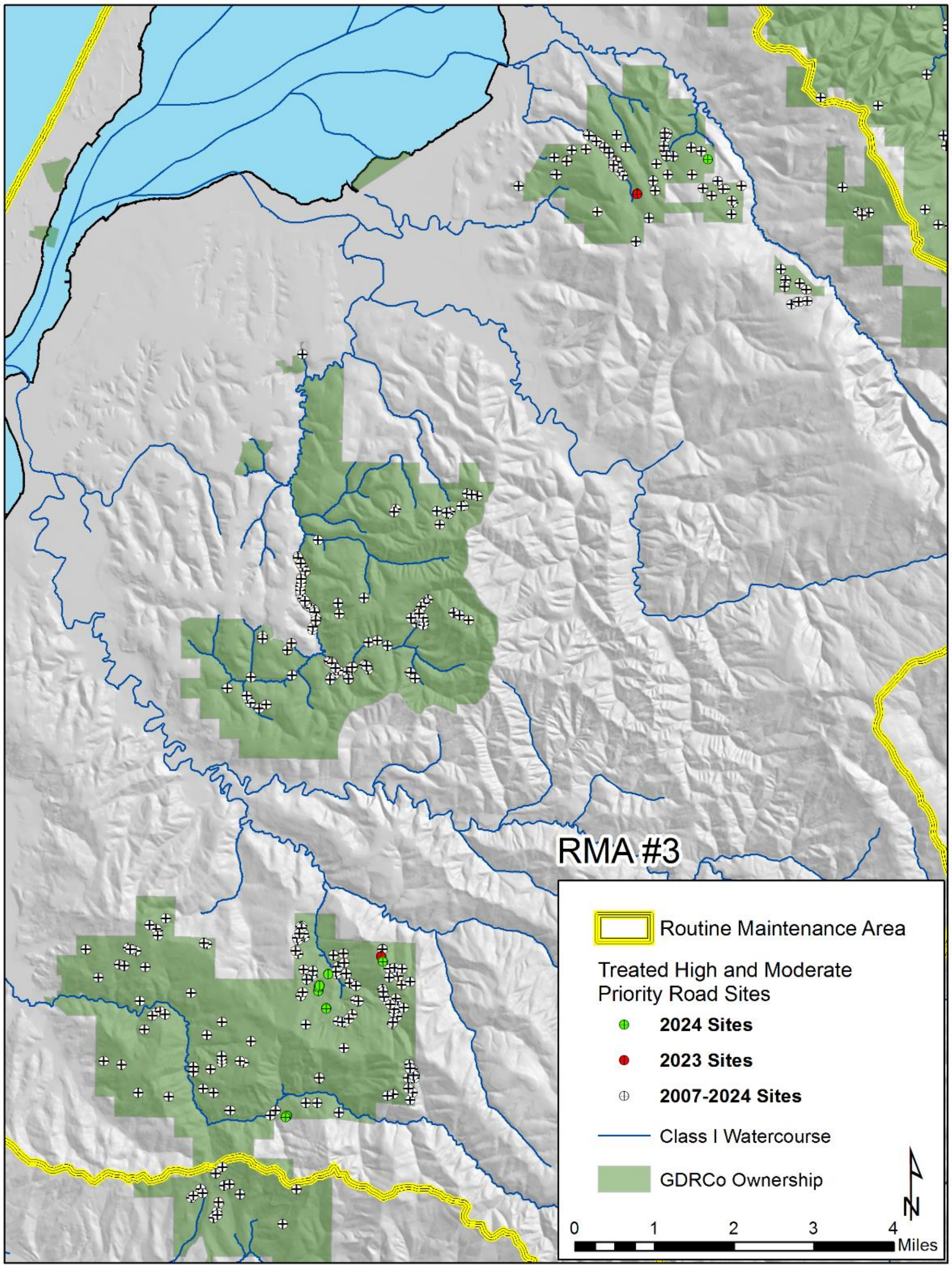
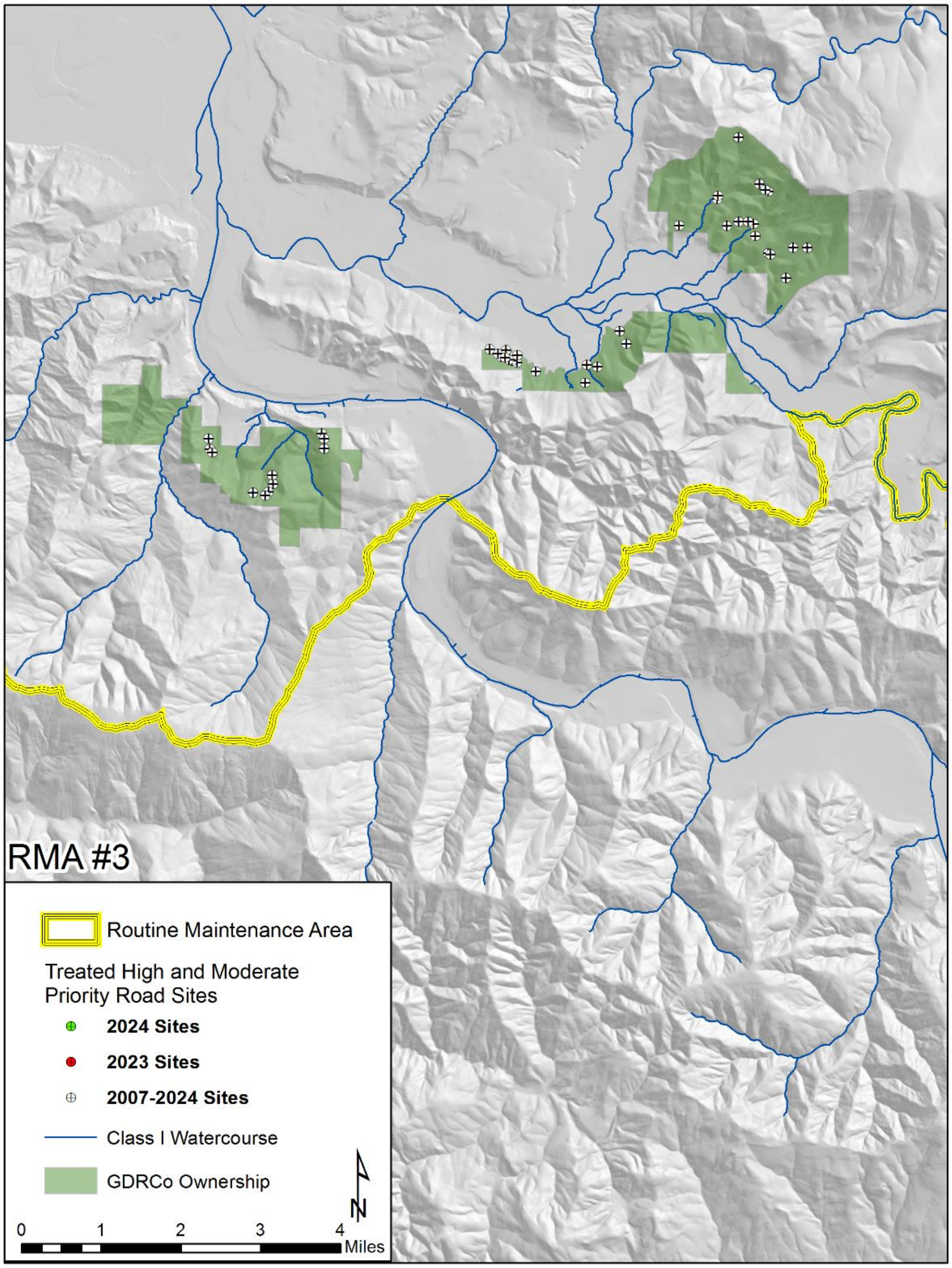


Figure 14. Location of High and Moderate priority road sites treated from 2007-2024 in the Eel River area.



VI. Geology

The AHCP requires GDRCo to conduct several geologic assessments across the Plan Area. The following discussion summarizes these individual projects.

A. CMZ/Floodplain Delineation

Green Diamond revised the CMZ/Floodplain Delineation project through a minor modification submitted in March of 2011. Since that time GDRCo has completed the CMZ/Floodplain mapping concurrent with THP development throughout the life of the ITP and ESP Permits. A summary of CMZ's and Floodplains delineated during the current reporting period is shown in Section II. F.

B. SSS Delineation Plan (AHCP Section 6.2.5.3.2)

Steep Streamside Slope's (SSS) are a default mass wasting prescription that are applied to steep slopes directly adjacent to Class I and Class II watercourses on GDRCo timberlands. These areas vary in size, depending on slope gradients, and are thought to require the retention of more timber than a Riparian Management Zone.

The stated goal of the SSS prescription is to achieve a 70 percent reduction of landslide volumes delivering to watercourses in comparison to historical management related landslide volumes. The original AHCP contained initial default prescriptions that GDRCo applied to qualifying SSS. In December of 2014 GDRCo completed the SSS Delineation Study (see AHCP Appendix D.3.3 for a detailed description of the study) that modified the initial SSS default prescriptions across the property. A copy of the final SSS Delineation Study was included in the 4th AHCP Biennial Report (GDRCo 2015).

C. SSS Assessment (AHCP Section 6.2.5.3.3 & Appendix D.3.4)

As described above, Steep Streamside Slopes are a mass wasting prescription that was developed specifically for GDRCo lands. The prescription was developed through a landslide study for GDRCo's AHCP. The SSS conservation measures are designed to be at least 70 percent effective at preventing sediment associated with management-related landslide volumes delivering to watercourses in comparison with historical landslide-related volumes originating from historically clearcut slopes about the referenced areas of the AHCP. With the proposed SSS Assessment GDRCo will determine the effectiveness of the default SSS prescriptions across the property. As per section 6.2.6.1.3 "SSS Triggers" if monitoring determines there is a need for changes to be made to the SSS widths and slope gradients an independent scientific review panel shall be assembled to analyze the resulting data.

1. Current Status of the SSS Assessment

A review of the interim SSS prescription buffers began in December of 2013. Initially there were 58 SSS assessment sites that totaled 102 acres of SSS. However, due to real-estate transactions the assessment areas were reduced to 53 sites and a total of 96 acres. All sites were reviewed in 2023 and 2024 using a combination of aerial helicopter flyovers and ground surveys and aerial imagery. Each survey followed water years with above average annual rainfall for the region. No new or reactivated landslides were observed. We now have surveys covering 12 to 16 years after completion of harvesting activities for these assessment sites. Table 18 shows a comparison of both delivery (to volume delivered to a watercourse) and erosion (total volume of sediment mobilized) rates of the assessment sites. Based on these data we are seeing a 92 percent reduction in delivery rates and a 98 percent reduction in total volume of delivered sediment related to shallow landslides in the study area.

Additionally, Green Diamond assembled a second SSS Assessment sample group consisting of 32 additional assessment sites (a total of 35 acres) that consisted of RSMZs and SMZs that were administered the revised SSS prescriptions established in 2015 after completion of the SSS Delineation Project described earlier. The sites for this Revised SSS Assessment Group were randomly selected and spatially distributed across the ownership using the MBAS sampling method, a method developed by McDonald and Lamphear from the BAS method (B. L. Robertson, J. A. Brown, T. McDonald, P. Jaksons, 2013). Timber harvesting associated with these sites was completed between 2015 and 2019. Surveys of each site were conducted using orthographically rectified aerial imagery from 2014, 2016, 2018, 2020, 2021, 2022, 2023 and 2024. As of the submittal date of this biennial report, no indication of post-harvest related landsliding has been observed.

These results were presented to the agencies via a PowerPoint presentation at Green Diamond in Korbel, CA on October 15, 2024. At the conclusion of the presentation it was agreed that Green Diamond would submit a summary of the findings of this monitoring project to the agencies to review with the intent that this project could be considered complete and that, due to the conclusive results, the scientific review panel is not warranted, as suggested in section 6.2.6.1.3. of the AHCP.

Table 18 – Comparison of Delivery and Erosion rates for the interim SSS Assessment group.

Note: Delivery to Channel Class = I & II, Units with post-harvest landslides were harvested in 2011(2) & 2012(1), with landslides occurring 5 to 6 years after harvesting.							
	Number of Landslides	Total Volume Delivered (yds³)	Total Volume Mobilized (yds³)	Average of Inclination (Slope %)	Time (yrs)	Sample Area (acres)	Delivery Rate yds³/acre/yr

Pre-Study Slides	41	3,893	7,791	88%	43	96	0.94
Slides Obs. During study	3	92	213	92%	12	96	0.08
Percent Reduction Post vs Pre-Study	93%	98%	97%				92%

D. Mass Wasting Assessment (AHCP Section 6.2.5.3.4)

The goal of the Mass Wasting Assessment (MWA) is to examine the relationship between landslide processes and timber management practices. This study will be based on the collection of a thorough landslide and land use history data set. We intend to utilize, and build upon, the existing landslide and land use history data sets that are being compiled for the SSS projects. The field data from each of these projects will also be incorporated into the MWA and will also be built upon as needed. For this study we will use the aforementioned data to focus on the causal mechanisms of the various mass wasting processes we observe throughout the ownership and specifically their relationship to timber management practices. In addition, we will examine other contributing factors such as climate, bedrock geology, and structural geology.

1. Purpose and Scope of the Assessment

The purpose of the MWA is to evaluate the influence of timber management practices on Mass Wasting for each of the 11 HPAs identified in GDRCo's AHCP.

The scope of work for the assessment is generally based on the standard methodology for mass wasting analysis as defined in The State of Washington's Forest Practice Board (WSFPB) watershed analysis manual. As described above we will consider a variety of factors in this assessment followed by detailed review and therefore this study would likely fall under the criteria of a Level 2 analysis as discussed in the mass wasting section of WSFPB's watershed analysis manual. This project will be completed within 20 years from the effective date of GDRCo's AHCP (July 1, 2027).

2. Current Status

The preliminary results of the Mass Wasting Assessment were submitted to the Services and other state agencies in November of 2016. To date our data collection has focused largely on shallow landslides due to the nature of our data collection efforts being centered on the SSS Delineation and Assessment projects. A revised look at shallow landslide erosion rates related to industrially managed timberlands by J.S. Woodward (2023) was submitted to the Association of Environmental and Engineering Geologists as a research article in 2022. This paper was accepted and published in May of 2023. This renewed look at shallow landslide erosion rates further supports our preliminary Mass Wasting Assessment and current management practices in general by highlighting a 92 percent reduction since 2000 (Woodward, 2023).

Class III watercourses have not yet been specifically assessed for mass wasting. However, our preliminary data suggests that it is unlikely that these areas contribute a significant amount of sediment as a result of mass wasting. This hypothesis has also held true over the years in our review of timber harvest plans. Our anecdotal evidence suggests that the vast majority of sediment related to mass wasting comes from slopes associated with higher order watercourses (ie Class I and II). During the 2025 reporting period, only six percent of the landslides added to our database were associated with Class III watercourses. A more formal review of these areas will be completed prior to the final Mass Wasting Assessment.

A look at mass wasting associated with deep-seated landslides is in progress. During the current reporting period, Green Diamond revised the sample areas for the deep-seated landslide mapping component. The revised sample watersheds were chosen based on their proximity to our aquatic monitoring areas to maximize our efforts. Mapping is complete for this project, and we are working on QA/QC before we begin on our analysis. This component will be completed and included in the final mass wasting assessment.

VII. Budget

Implementation Agreement Section 8.1(b) requires GDRCo to submit a detailed budget for measures pursuant to the Operating Conservation Program that require out-of-pocket expenditure that will be implemented in each subsequent calendar year before the next biennial report is due. In previous biennial reports the planned and anticipated budgets included expenditures for road work associated with treating high and moderate sites to demonstrate compliance with the annual spending requirement for the Acceleration Period for the Road Management Plan (See AHCP Section 6.2.3.2). As described in Section V.C. above, GDRCo met the total spending requirements for the Acceleration Period in 2020 (a half year early). With the successful completion of this AHCP requirement, there is no longer an average annual spending target or need to forecast the annual road expenditures for high or moderate priority road sites. GDRCo will continue to perform road treatments across the property associated with THP activities and with implementation of the Road Maintenance and Inspection Plan associated with the AHCP; however, tracking the costs associated with these activities is no longer required. Table 19 summarizes the planned budget for implementing the monitoring requirements of the AHCP for

2025. Table 20 summarizes the anticipated budget for implementing the monitoring requirements of the AHCP for 2026. The 2025 planned budget formed the basis for projecting the anticipated 2026 budget and is therefore similar in many ways.

Table 19. Planned budget for 2025.

Item		Amount
Payroll		
Salaries	$	1,186,161
Benefits	$	314,589
Misc. Supplies (including fuel)	$	147,215
Equipment Maintenance	$	31,143
Professional Services	$	39,689
Other Misc. Costs	$	29,882
Total	$	1,748,679

Table 20. Anticipated budget for 2026.

Item		Amount
Payroll		
Salaries	$	1,221,746
Benefits	$	324,027
Misc. Supplies (including fuel)	$	151,631
Equipment Maintenance	$	32,077
Professional Services	$	39,689
Other Misc. Costs	$	30,778
Total	$	1,799,948

VIII. Effectiveness Monitoring

Effectiveness monitoring and adaptive management are key components of Green Diamond’s AHCP. The AHCP sets specific biological goals and objectives related to the abundance, distribution, and habitat of the Covered Species (AHCP Section 6.1) and it defines an Operating Conservation Program intended to achieve those goals and objectives (AHCP Section 6.2). The role of the Effectiveness Monitoring Program is to track the success of the Operating Conservation Program in meeting the AHCP’s biological goals and objectives, and to provide the feedback needed for adaptive management if those goals and objectives are not being met. The Effectiveness Monitoring Program is described in AHCP Sections 6.2.5 and 6.3.5, with detailed protocols included in AHCP Appendix D.

The monitoring projects and programs fall into four categories: Rapid Response Monitoring, Response Monitoring, Long-term Trend Monitoring and Research, and Experimental Watersheds Program. The first three categories are based on the minimum time frame over which feedback for adaptive management is likely to occur. The time scales are a product of the specific variables or processes being measured as well as the available monitoring protocols currently used.

The Rapid Response and Response Monitoring projects form the backbone of the adaptive management process. Each project has (or will establish) measurable thresholds which, when exceeded, initiate a series of steps for identifying appropriate management responses. To provide the ability to respond rapidly to early signs of potential problems while providing assurances that negative monitoring results will be adequately addressed, a two-stage "yellow light, red light" process is employed. The yellow light threshold serves as an early warning system to identify and rapidly address a potential problem. As such, the yellow light thresholds can typically be exceeded by a single negative monitoring result (i.e., summer water temperatures). The red light threshold is usually triggered by multiple negative monitoring responses (a series of yellow light triggers) and indicates a more serious condition than the yellow light threshold. The intent is to provide a timely review of monitoring data to allow for corrective actions to occur, if necessary, prior to the next season.

A. Rapid Response Monitoring

The Rapid Response Monitoring projects and programs will provide the early warning signals necessary to ensure that the biological goals and objectives of the AHCP will be met. While trends which occur over longer time scales will also be monitored through these projects, they are distinguished from the response and trend monitoring projects by their potential to provide rapid feedback for adaptive management. The yellow light threshold for these projects can typically be triggered in less than one year, although the annual analysis of results will be necessary to identify the yellow light condition. The red light threshold will generally take two to three years to be triggered.

1. Property-wide Water Temperature Monitoring

Objectives and Thresholds

Maintaining cool water temperature regimes consistent with the requirements of the Covered Species is a biological goal of the AHCP. To inform appropriate biological objectives and adaptive management thresholds for achieving this goal, an analysis was conducted of 400 stream temperature profiles collected in the Plan Area from 1994 to 2000. The results pointed to watershed area as a key factor in water temperatures, and were used to help set the following biological objectives:

1. Summer water temperatures in 4th order or smaller Class I and II watercourses with drainage areas less than approximately 10,000 acres will have a 7DMAVG below the upper 95% Prediction Interval (PI) described by the following regression equation: *Water Temperature* (^{o}C) = *14.35141 + 0.03066461x square root of Watershed Area (acres)*

2. No significant increases (>2 ^{o}C) in the 7DMAVG water temperature in Class I or II watercourses following timber harvest that are not attributable to annual climatic variation.

Yellow and red light thresholds for adaptive management were adopted based on these objectives.

- The yellow light threshold in Class I and II watercourses with drainage areas generally less than 10,000 acres is:
  a) A 7DMAVG water temperature above the upper 95% PI, as described by the regression equation: *Water Temperature* (^{o}C) *= 14.35141 + 0.03066461x square root of Watershed Area (acres);* <u>or</u>
  b) Any statistically significant increase in the 7DMAVG water temperature of a Class I or II watercourse where recent timber harvest has occurred, which cannot be attributed to annual climatic effects.

- The red light threshold in Class I and II watercourses with drainage areas generally less than 10,000 acres is:
  a) A 7DMAVG water temperature above the upper 95% PI plus one °C, as described by the regression equation: *Water Temperature (^{o}C) =15.35141+ 0.03066461x square root of Watershed Area (acres)*;
  b) An absolute water temperature of 17.4 °C (relevant for fish); or
  c) A 7DMAVG water temperature that triggers a yellow light for three successive years.

<u>Project Status</u>

Monitoring of Class I (fish-bearing) and Class II (non-fish bearing) stream temperatures is operational and has been ongoing since 1994. More than 2,700 stream temperature profiles have been collected since 2000 from throughout the AHCP Plan Area. Over 140 temperature loggers are deployed annually. To date over the life of the AHCP, 2007-2024, 2,808 stream temperature profiles have been collected.

The objective of this project is accomplished by installing temperature dataloggers (Onset Computer Corp.) in Class I and II streams across the Plan Area. Dataloggers are deployed where the water is well-mixed; typically at the head of a shallow pool just below a riffle input. Dataloggers are usually deployed in May after the winter flows have subsided, and they are typically retrieved in October. This monitoring period ensures that the warmest period of the year is measured. Each datalogger is fixed in the stream and covered with cobble to assure that the sensor stays submerged and is not exposed to direct sunlight. Water temperature measurements are logged every 1.2 hours for the duration of the monitoring period. A database has been developed to store data, assess thresholds, and calculate summary statistics. Improvements were made to the accuracy of monitoring site locations (current and many historical sites). This improvement also allowed for upgrading the accuracy of the watershed areas calculated for each monitoring sites. Watershed area was calculated with a Flow Accumulation Model using the best available data from either GDRCo LiDAR digital elevation model (DEM, accuracy = ± 1 meter) or USGS 10-meter DEM.

A reanalysis of the appropriate adaptive management thresholds was proposed to the Services in the March 2011 request for Minor Modifications. The intent of this request was to address the finding that current thresholds are regularly exceeded without causal links to management activities under AHCP/CCAA prescriptions. Reanalysis could potentially establish a better Prediction Interval and minimize the apparent false positives detected using the current thresholds. After review and consideration, the Services recommended that the current thresholds be maintained at this time. Green Diamond acknowledges this decision and will maintain using the original thresholds established for this monitoring program.

<u>Reporting Requirements</u>

Sites that exceed a yellow or red light threshold are reported to the Services within 30 days after an analysis indicating that a threshold has been exceeded (AHCP Section 6.2.6.1.1). The temperature recorders are typically recovered from the field in October and the data are downloaded shortly after. Prior to analysis data are proofed for quality assurance. After completing the analysis, the results are reported to the Services via email correspondence.

<u>Results</u>

A combined total of 315 stream temperature profiles were collected in 2023 and 2024 at Class I and II streams for the property-wide water temperature monitoring program. During this two-year monitoring period forty-eight yellow light and thirty-six red light thresholds were exceeded (Table). Compared to past monitoring efforts, the 2023 and 2024 monitoring seasons experienced a higher than average (14.8) number of exceedances with 46 and 38 exceedances, respectively (Table 21). Only stream temperature sites from the Plan Area that have <10,000 acres of watershed upstream are evaluated for threshold exceedances and included in this summary.

Table 21. Summary of property-wide water temperature monitoring threshold exceedances documented from 2007-2024.

		Threshold Exceedances			
Year	**# Sites Monitored**	**Yellow light**	**Red light**	**Total**	**%**
2007	158	9	2	11	7.0
2008	168	3	0	3	1.8
2009	157	1	1	2	1.3
2010	141	0	0	0	0.0
2011	143	0	0	0	0.0
2012	162	0	0	0	0.0
2013	157	10	0	10	6.4
2014	155	6	0	6	3.9
2015	161	16	3	19	11.8
2016	155	4	5	9	5.8
2017	160	35	16	51	31.9
2018	160	4	1	5	3.1
2019	159	11	3	14	8.8
2020	157	13	4	17	10.8
2021	142	8	6	14	9.9
2022	158	14	7	21	13.3
2023	160	30	16	46	28.8
2024	155	18	20	38	24.5
Mean	156.0	10.1	4.7	14.8	9.4

Discussion

Variation in summer weather conditions is the most probable explanation for the variation in exceedances documented since 2007. It appears that there is a relationship between minimum air temperatures and the percent of water temperature threshold exceedances (Figure 15). The relationship between air temperature and stream temperature is well established (Mohseni and Stefan 1999) and based on this relationship the results from 2023-2024 were not unexpected. It appears that the driver for the percent of water temperature threshold exceedances is the deviation of the minimum air temperature from the 30-year normal at the water temperature sites (Figure 15). Over the past 18 years, the deviation of the average minimum air temperature has been elevated. In general, when there have been higher daily minimum air temperatures; air temperatures have not been cooling off as much at night. This translates to increased water temperatures because the water temperature, similarly, is not able to cool off at night allowing the water temperature to increase more the following day with the water starting at a warmer temperature to begin with. Generally, when the average minimum air temperature is close to the 30-year normal, there are few water temperature exceedances; and, when the average minimum air temperature deviates above the 30-year normal, more temperature exceedances occur.

The average percentage of sites exceeding the 95% PI over the last eighteen years has generally been within the expected range. Given the 95% PI basis for the thresholds; by definition, an average of 5% of sites should fall outside of the PI, with half above and half below. The probability distribution on which these water temperature monitoring thresholds were established ensures that some thresholds will be exceeded in most years. The number of exceedances in 2023 and 2024 were above the expected amount and were likely caused by increased summer air temperatures.

Despite the red and yellow light water temperature thresholds that were exceeded during the 2023 and 2024 monitoring periods, following an extensive review of AHCP Covered Activities upstream and immediately adjacent to water temperature monitoring sites as well as historical water temperature data, it was determined that the observed water temperature exceedances at these sites were not biologically significant for the Covered Species. Salmonids thrive in dynamic environments as long as the water is fairly cool (< 22 °C maximum; Moyle 2002). During our summer monitoring period, there are three primary salmonid species that may be encountered in Class I streams located on GDRCo ownership: Coho (*Oncorhynchus kisutch*), Steelhead (*Oncorhynchus mykiss irideus*) and Coastal Cutthroat (*Oncorynchus clarkii clarkii*). These animals are cold water adapted and generally inhabit streams ranging in temperature from 10 to 16 °C, but may be found in warmer conditions if food is plentiful and habitat conditions are favorable (Moyle et al. 2016). Two amphibian species that are often encountered in Class I streams are Coastal Giant Salamanders (*Dicamptodon tenebrosus*) and Coastal Tailed Frogs (*Ascaphus truei*). These two species also inhabit Class II streams. Southern Torrent Salamanders (*Rhyacotriton variegatus*) inhabit Class II streams but are usually associated with seeps and headwater habitats. These amphibian species are cold water adapted and generally inhabit streams ranging in temperature from 7 to 16 °C but can tolerate warmer temperatures under certain conditions (Adams and Frissell 2001, Bury 2008, Brown 1975, Diller and Wallace 1996, Diller and Wallace 1999). Additionally, these threshold temperatures are not sustained for long periods of time and drop to levels that are more favorable to the species.

While some of the sites that had water temperature exceedances also had some level of timber harvest above the monitoring site, it is unlikely that timber harvest overall had a significant negative influence on water temperatures at these sites. Some sites had temperature threshold exceedances in previous years when no recent timber harvest had occurred. The exceedances triggered are likely from site specific situations associated with regional climatic conditions (e.g. air temperature). GDRCo believes that the results to date indicate that the Operating Conservation Program is achieving its goal of maintaining water temperatures that meet the needs of the Covered Species.

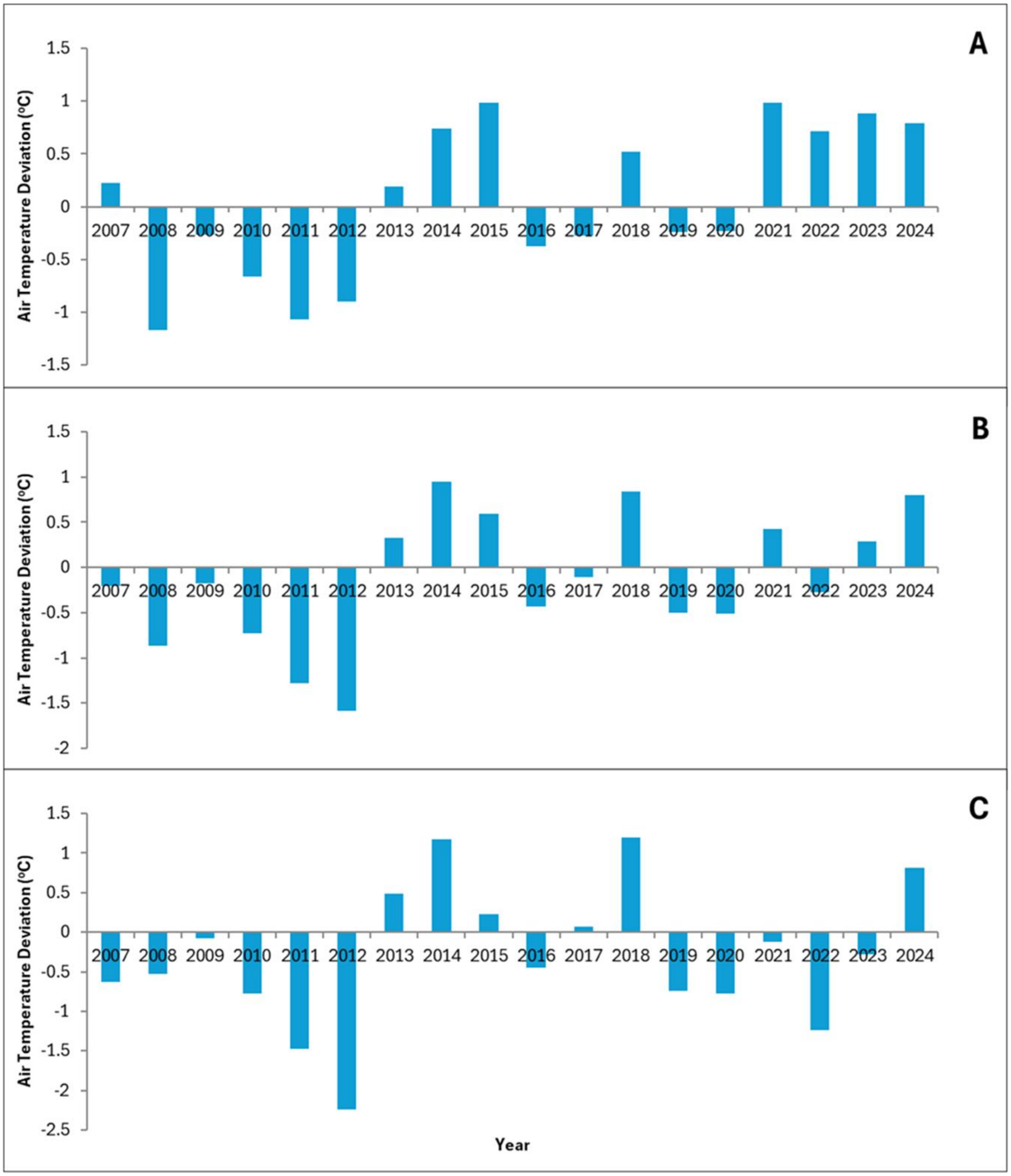


Figure 15. Deviation in minimum (A), mean (B) and maximum (C) air temperature from the 30-year normal for the month of July.

2. Coastal Tailed Frog Monitoring

<u>Introduction</u>

The Coastal Tailed Frog (*Ascaphus truei*) component of the headwaters amphibian monitoring program consists of two objectives. The primary objective is to determine if timber harvest activities have a measurable impact on larval tailed frog populations. These sites are monitored on an annual basis (Figure 8). The secondary objective is to document long-term trends in larval Coastal Tailed Frog populations over GDRCo's ownership via occupancy surveys (Figure 9). Occupancy surveys are repeated approximately every ten years. Change in occupancy of larval Coastal Tailed Frog populations in Class II watercourses throughout the plan area will be assessed using the historical baseline established in 1995 of 75% occupancy.

In 2013 pilot surveys using environmental DNA (eDNA) were conducted to test the efficacy of using eDNA to survey for the occurrence of Coastal Tailed Frogs. This led to a collaboration with a California State Polytechnic University, Humboldt graduate student involving eDNA sampling in three sub-basins in which multiple water samples were collected every 100 m over approximately 2 km stream reaches, coupled with 100% rubble-rouse/visual encounter surveys (VES) for larval Coastal Tailed Frogs. The objectives of this study were to relate the occurrence and density of eDNA in water samples with the distribution and abundance of larval Coastal Tailed Frogs. Detection rates for eDNA sampling (≥94%) were higher than those for our traditional sampling (≥91%), showing that eDNA sampling is an effective method of monitoring Coastal Tailed Frog presence (Smith 2017).

<u>Project Status</u>

<u>-Primary Objective: *Annual Monitoring*</u>
The annual monitoring program to assess timber harvest impacts on larval Coastal Tailed Frog populations was reviewed in 2014. A summary of the history of research and monitoring in addition to the results from recent data analyses and a proposed future monitoring direction were compiled into a report which was included in the 4th Biennial Report (GDRCo 2015a, Appendix D, Part 1). After completing the 2013 sampling season, the original larval Coastal Tailed Frog monitoring objectives and thresholds (see AHCP Appendix D.1.6.2.1.1 for details), as well as the revised protocol submitted to the Services in 2012 were discontinued. A formal data analysis was conducted in 2014 by Western EcoSystems Technology Incorporated (WEST Inc.) and the results justified discontinuing this project. Details on the data analysis for the project and results were provided in the 4th Biennial Report (GDRCo 2015a, Appendix D, Part 2). Based on the findings from this study, we have concluded that modifications to the original study design and established thresholds were warranted. The Services were briefed on the results during a meeting in 2014 and were also introduced to the proposed direction of future monitoring efforts for this project (GDRCo 2015a, Appendix D, Part 3). Upon acceptance of the proposed monitoring protocol by the Services, the current monitoring protocol uses a light-

touch rubble rouse/VES methodology to confirm larval Coastal Tailed Frog presence and is conducted during early spring in conjunction with the deployment of water temperature sensors. Occupancy specific sampling was initiated in 2015 and has continued through 2024.

-Secondary Objective: *Property-wide Occupancy Surveys*
Changes to the protocol regarding long-term monitoring of property-wide larval Coastal Tailed Frog occupancy have been reviewed and modifications to this monitoring project have been approved. The 2nd Biennial Report (GDRCo 2011a) provided a summary of the project history and results from a preliminary analysis completed in 2009 by WEST Inc. Additional analyses were conducted and the results were provided in the 4th Biennial Report (GDRCo 2015a, Appendix D, Part 2). Based on the findings from this study, we have concluded that modifications to the original study design and established triggers were warranted. The Services were briefed on the results in 2014 and were also introduced to the proposed direction of future monitoring for this project (GDRCo 2015a, Appendix D, Part 3). On April 27, 2018, GDRCo submitted a minor modification request with the proposed revisions to the property-wide occupancy survey protocol. Revisions to this protocol were approved by the Services on May 20, 2019 (See Section II.D.1.). Field work for this project was initiated May 20, 2019, and concluded March 20, 2020.

The following is a summary of the revised property-wide larval Coastal Tailed Frog occupancy survey protocol: Upon arrival at each stream, a 1 L water sample was obtained to test for the presence of Coastal Tailed Frog eDNA. Biologists then collected habitat data (e.g., wetted width, active channel width, water depth, stream gradient, substrate composition, substrate embeddedness, riparian tree composition), as well as searched for larval Coastal Tailed Frogs using the same light-touch/VES methodology employed during our annual monitoring efforts. Each stream was searched until larval presence was documented or until 200 m of stream habitat was searched. If larval presence was documented within the 200 m stream segment surveyed, the first eDNA sample was not tested for Coastal Tailed Frog presence but was run to test for the presence of the chytrid fungus and collection of a second eDNA sample was not necessary. If larval Coastal Tailed Frogs were not detected within the 200 m survey, a second eDNA sample was obtained at the top of the reach. Both samples were run to test for Coastal Tailed Frog presence, but only the first sample was run for the presence of chytrid. In changing from a relative abundance-based rubble-rouse survey to a presence/absence survey employing a combination of light-touch rubble rouse/VES techniques and eDNA sampling, we were able to reduce the amount of habitat searched (from 1,000 m to 200 m), therefore reducing the disturbance to stream habitats.

Results

-Primary Objective: *Annual Monitoring*

Larval Coastal Tailed Frog population monitoring was initiated in 1997 at three paired sites (n = 6 sites) to assess occupancy and derive population estimates for this species on GDRCo ownership. By 2011 the number of monitoring sites was increased to ten paired sites (n = 20; Figure 16; Table 22). These sites were monitored between 1997 and 2013, having 100% larval occupancy every year at all sites (Table 22). In 2014, data were analyzed for this period (1997-2013), and it was determined that there were no biologically meaningful management impacts (negative or positive) to larval Coastal Tailed Frog populations (GDRCo 2015a, Appendix D, Part 2). It was decided that the objectives of this phase of monitoring were met and the new objective of monitoring larval Coastal Tailed Frog occupancy at these sites was initiated. One set of paired sites in the Bear Creek drainage was located on property sold in 2013, which brought our number of paired sites to 9 (n = 18; Figure 16). In 2015, annual larval occupancy surveys were initiated at the remaining sites. We have had 100% larval Coastal Tailed Frog occupancy at all our annual monitoring sites every year since the start of this new monitoring objective (Table 22).

-Secondary Objective: *Property-wide Occupancy Surveys*

Following formal analyses of the 1995 and 2008 data sets, results for the long-term Coastal Tailed Frog occupancy monitoring study across GDRCo's ownership were provided in the 4th Biennial Report (GDRCo 2015a, Appendix D, Part 2). In this report we are presenting a comparison of the proportion of sites occupied during each survey period (1995, 2008, 2019), as a formal analysis has not been performed on all three sampling periods. As a result of land acquisitions and sales between 1995 and 2019, there was some variation in the sites surveyed during each of the three sampling periods (Figure 9).

Our initial property-wide occupancy surveys in 1995 established a baseline occupancy rate of 75% (54 of 72 sites; Table 23) for larval Coastal Tailed Frogs. During the 2008 survey, 85 sites were surveyed across the property (Figure 16), resulting in a larval occupancy rate of 83.5% (71 of 85; Table 23). Of the 85 sites surveyed in 2008, 67 were initially surveyed in 1995. Occupancy rates of these original 67 sites increased from 77.6% (1995) to 83.6% (2008). During our third round of property-wide occupancy surveys in 2019, a total of 72 sites were surveyed, 55 of which were from the original set of sites surveyed in 1995 and revisited in 2008 (Table 24). Our 2019 survey used light-touch rubble rouse/VES coupled with eDNA sampling to determine Coastal Tailed Frog occupancy, as well as test for the presence of the chytrid fungus, which can have detrimental effects on amphibian populations (Skerratt et al. 2007). Because eDNA sampling was used, we were able to reduce our light-touch rubble rouse/VES sampling reaches from 1,000 m to 200 m, and in turn were sampling much less of any given site. With our revised sampling protocol, we detected larval Coastal Tailed Frogs at 77.8% of the sites via light-touch rubble rouse/VES sampling (Table 23). However, the occupancy rate for Coastal Tailed Frogs of any life history stage (e.g., larva, juvenile, adult) was 83.3% and when factoring in results from eDNA sampling, our occupancy rate increased to 87.5% (Table 23), a higher occupancy rate than our two previous survey periods. Of the 55 sites surveyed during all three periods, in 2019 we saw 87.2% occupancy for any life history stage and 81.8% larval occupancy, a 10.9% increase in any life history stage occupancy and 5.5% increase in larval occupancy when compared to the original surveys in 1995 (Table 24). When factoring in our eDNA results for these 55 sites, we saw an occupancy rate of 90.9% (Table 24). Out of 72 sites surveyed in 2019, four sites (5.6%) tested positive for the presence of the chytrid fungus (Figure 17).

Discussion

Previous studies on GDRCo property have indicated that many streams inhabited by Coastal Tailed Frogs had at least some evidence of habitat being negatively impacted by past unregulated timber harvest (Wallace and Diller 1998, Diller and Wallace 1999). This was particularly evident in lower gradient reaches where fines were likely to accumulate and substrates became embedded; however, most populations persisted, particularly in high gradient reaches and where the underlying geology was generally favorable (i.e., not young, uplifted marine or unconsolidated bedrock). We have learned from 28 years of monitoring larval Coastal Tailed Frog populations, that the distribution and abundance of populations has been at a minimum stable, but most likely increasing. This is likely due to improved protections allotted to aquatic habitats in more recent years through the AHCP. Other factors that may have ameliorated the negative effects of past unregulated timber harvest on Coastal Tailed Frog populations include cool summer temperatures (relative to inland areas) and coastal fog, as well as shorter larval periods (1-2 years) compared to higher elevation, inland populations (up to five years; Wallace and Diller 1998)

Based on a combination of light-touch rubble-rouse/VES and eDNA sampling, our 2019 property-wide Coastal Tailed Frog occupancy rate was 87.5%. When looking at larval detections using only the light-touch rubble-rouse/VES method, our 2019 occupancy rate was 77.8%, still exceeding the baseline occupancy of 75% established during the 1995 surveys (Tables 23 and 24); however, when excluding eDNA sampling the 2019 larval occupancy rate was lower than the 2008 larval occupancy rate (Tables 23 and 24). This decrease in larval detection was likely due to the reduction in rubble-rouse/VES reach lengths from 1000 m to 200 m during our 2019 surveys. On some streams during the 1995 and 2008 surveys, larvae were not detected until well past the 200 m reach lengths searched during our 2019 surveys. It should be noted that eDNA occupancy cannot account for life history stage, therefore we cannot say with confidence that the streams that did not have larval detections through light-touch rubble-rouse/VES, but had positive results via eDNA sampling, do indeed support breeding populations of Coastal Tailed Frogs. Nonetheless, we can say that the frogs are present within those drainages.

Out of 72 sites tested in 2019 for the presence of the chytrid fungus through eDNA sampling, four sites tested positive for the presence of the fungus, indicating that the fungus is not present on a large scale in streams inhabited by Coastal Tailed Frogs across GDRCo's ownership. Conversely, of the 90 larval Coastal Tailed Frogs captured during the property-wide and annual occupancy surveys (90 sites) none showed signs of chytridiomycosis. Decontamination measures have been and will continue to be followed by GDRCo at all sampling sites for all projects to avoid the potential spread of harmful pathogens.

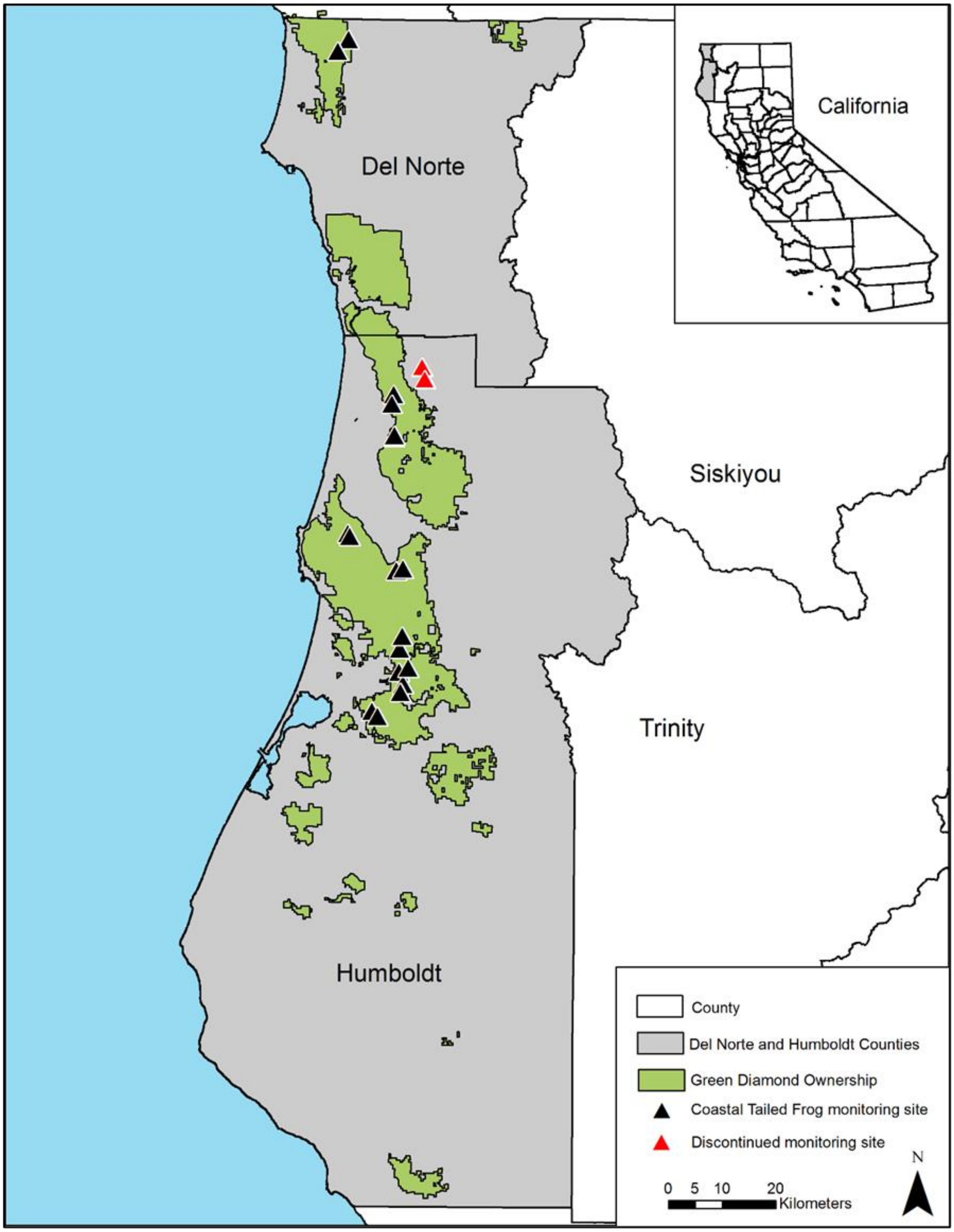


Figure 16. Locations of our annual larval Coastal Tailed Frog (*Ascaphus truei*) occupancy monitoring sites (n = 18) and discontinued sites (n = 2), Del Norte and Humboldt Counties, California. Note: some sites overlap at this scale.

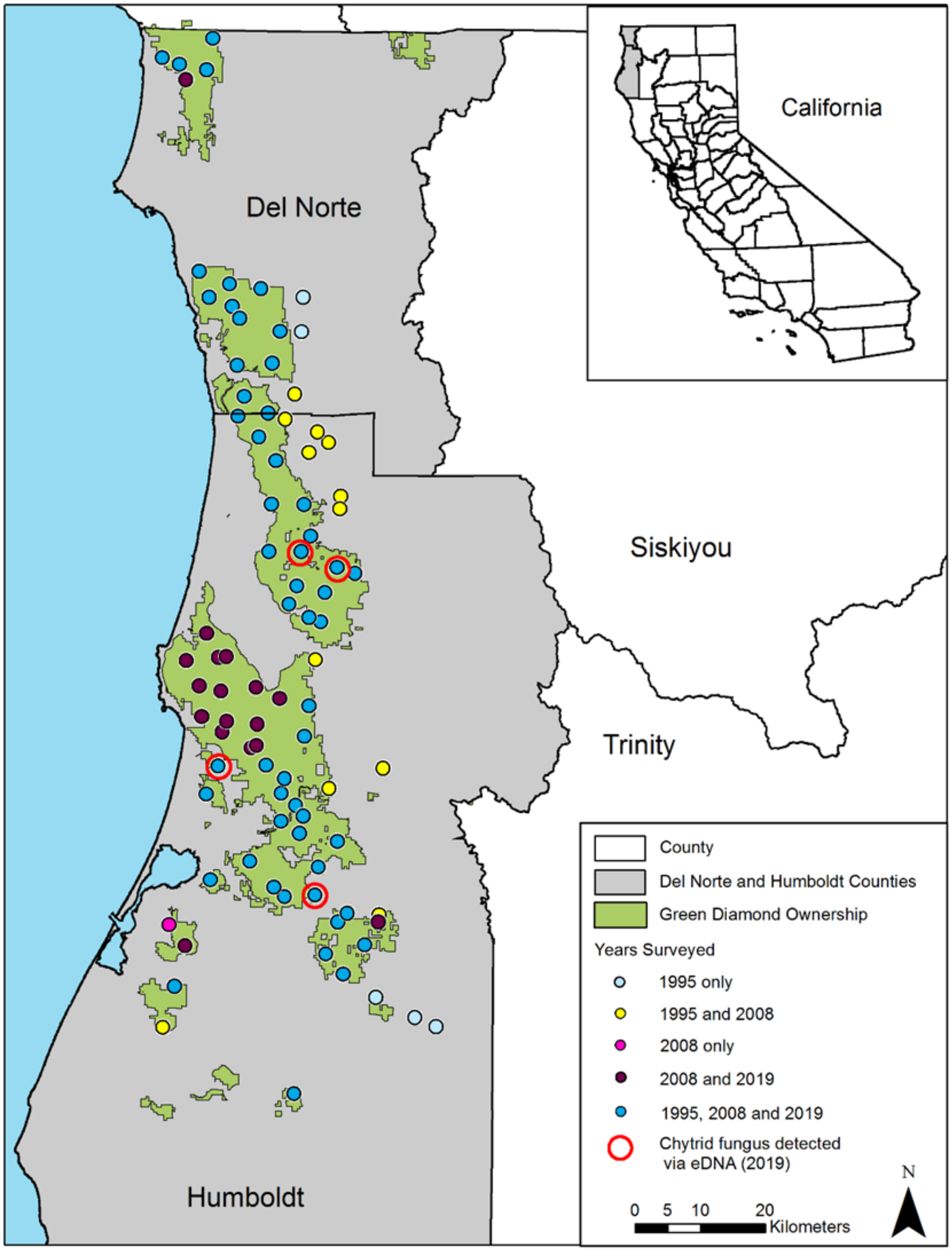


Figure 17. Locations of our larval Coastal Tailed Frog property-wide occupancy survey sites (1995, 2008 and 2019) and where the chytrid fungus was detected (2019 only) via eDNA sampling, Del Norte and Humboldt Counties, California.

Table 22. Coastal Tailed Frog larval occupancy between 1997 and 2024 at GDRCo's annual monitoring sites ("+" = occupied by larval tailed frogs; "NS" = not surveyed; sites that were not surveyed prior to 2011 had not yet been established, sites not surveyed after 2014 were on property that was sold). Paired sub-basin larval population monitoring was suspended upon the completion of the 2013 field season, no sites were surveyed during the transitional 2014 season. In 2015 larval occupancy surveys were initiated at our annual monitoring sites (n = 18) and have continued through 2024.

	Year																											
Site Name	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Black Dog 5300	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Black Dog 5400	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Mule	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Pollock	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Poverty	NS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Jiggs	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Hatchery	NS	NS	NS	NS	NS	NS	NS	NS	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Canyon	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Panther CR2960	NS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Panther CR 2970	NS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
NF Maple BL2000	NS	NS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
NF Maple BL 2600	NS	NS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Surpur West	NS	NS	NS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Surpur South	NS	NS	NS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Bear BC200	NS	NS	NS	NS	NS	+	+	+	+	+	+	+	+	+	+	+	+	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Bear BC270	NS	NS	NS	NS	NS	+	+	+	+	+	+	+	+	+	+	+	+	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Rowdy R1700	NS	NS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Rowdy R1000	NS	NS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Tectah T190	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Tectah T100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	+	+	+	NS	+	+	+	+	+	+	+	+	+	+
Occupancy	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NS	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 23. Comparison of landscape-level Coastal Tailed Frog occupancy at all sites, each year surveyed. (LHS = life history stage; eDNA samples only collected during the 2019 survey).

Year	Streams Surveyed	% Occupied (any LHS)*	% Occupied (Larva)*	% Occupied (eDNA)^
1995	72	75.0	75.0	x
2008	85	84.7	83.5	x
2019	72	83.3	77.8	87.5

* = Detected via rubble rousing; ^ = Detected via rubble rousing or eDNA

Table 24. Comparison of Coastal Tailed Frog occupancy amongst streams originally surveyed in 1995 and revisited in 2008 and 2019 (LHS = life history stage; eDNA samples only collected during the 2019 survey).

Year	Streams Surveyed	% Occupied (any LHS)*	% Occupied (Larva)*	% Occupied (eDNA)^
1995	55	76.3	76.3	x
2008	55	83.6	81.8	x
2019	55	87.2	81.8	90.9

* = Detected via rubble rousing; ^ = Detected via rubble rousing or eDNA

3. Southern Torrent Salamander Monitoring

Introduction

There are two objectives associated with the Southern Torrent Salamander (*Rhyacotriton variegatus*) component of the headwaters amphibian monitoring program. Similar to the Coastal Tailed Frog monitoring program, the primary objective of the Southern Torrent Salamander monitoring program is to determine if timber harvest activities have a measurable impact on salamander populations at our annual monitoring sites (Figure 10). The secondary objective is to document long-term changes in Southern Torrent Salamander populations across GDRCo's ownership. Property-wide occupancy surveys have been repeated at approximately 10-year intervals (1994, 2008 and 2019; see Diller and Wallace 1996, GDRCo 2009; Figure 18). Change in occupancy of Southern Torrent Salamander sub-populations in Class II watercourses throughout the Plan Area will be assessed using the historical baseline of 80% occupancy established in 1994.

Project Status

-Primary Objective: *Annual Monitoring*

Since GDRCo began monitoring Southern Torrent Salamander populations for potential impacts of current timber harvest practices, the protocol has undergone minor revisions. Modifications to the original AHCP protocol (AHCP Appendix D.1.6.1) were proposed to the Services in the March 2011 request for Minor Modifications. The intent of this request was to adjust to the challenges and issues experienced with past monitoring efforts. Details on the history of this monitoring project and past challenges were provided in the 2nd Biennial Report (GDRCo 2011a). After review and consideration, the Services concurred with the proposed modifications and requested the revised protocol be provided for review and approval. On July 24, 2012, the Services were provided with the revised protocol for this monitoring program. No revisions were requested by the Services and the revised protocol was implemented for this monitoring program at all 30 of our annual monitoring sites. More recently we have noticed larval detections at some of our annual monitoring sites declining, therefore with the approval of the Services we initiated a return to a biennial survey schedule in 2019 where we randomly selected half of our annual monitoring sites (n=15) to be surveyed for larval Southern Torrent Salamander occupancy and the outstanding sites (n = 15) in 2020. This biennial survey schedule will be continued, allowing sites a longer recovery period between surveys. On April 23, 2019, GDRCo submitted the revised protocol reflecting this biennial sampling schedule. The Services evaluated and approved the modified protocol on May 20, 2019 (See Section II.D.2.).

The current monitoring protocol uses a light-touch visual encounter survey (VES) method to confirm larval Southern Torrent Salamander presence and is conducted during late fall/early winter in conjunction with the retrieval of water temperature sensors. Occupancy specific sampling was initiated in 2015 and has been conducted through 2024 (Table 25).

-Secondary Objective: *Property-wide Occupancy Surveys*
The long-term monitoring of Southern Torrent Salamander occupancy was initiated in 1994, with the 2nd and 3rd rounds occurring in 2008 and 2019. The 2nd Biennial Report (GDRCo 2011a) provided a summary of the project history and results from a preliminary analysis completed in 2009 by Western EcoSystems Technology, Incorporated. Additional analyses were conducted, and the results were provided in the 4th Biennial Report (GDRCo 2015, Appendix D, Part 2). Based on the findings from this study, it was determined that modifications to the original study design and established triggers were warranted. The Services were briefed on the results during a meeting in 2014 and were also introduced to the direction of the proposed future monitoring for this project (GDRCo 2015a, Appendix D, Part 3). On April 27, 2018, GDRCo submitted a minor modification request to the Services with the proposed revisions to the property-wide Southern Torrent Salamander occupancy survey protocol. The change proposed was a shift from an occupancy and relative abundance-based survey to just an occupancy survey. As the presence of larval salamanders indicates that the site provides sufficient habitat for reproduction and rearing, it was decided that this was an appropriate metric for monitoring potential impacts of timber harvest on populations. Revisions to the protocol were approved by the Services on May 20, 2019 (See Section II.D.1.). During the 2019 survey, each stream was searched until larval Southern Torrent Salamander presence was documented or until 500 m of habitat was searched. For each amphibian encountered, the following information was recorded: species, life history stage, sex (if possible), snout-vent length, total length and location of capture (distance upstream from start of survey). Although the goal was to detect larval Southern Torrent Salamander presence, any Southern Torrent Salamander encountered was considered occupancy due to the understanding that these salamanders are considered to be highly aquatic even in post-metamorphic stages and have relatively small home ranges (Nussbaum et al. 1983, Petranka 1998, Welsh and Karraker 2005).

Due to property sales and acquisitions, the number of sites surveyed from 1994 to 2008 had changed. As a result of these transactions, from 1994 to 2008, six sites were dropped, and 20 new sites were added (Figure 19). During the 2019 surveys, 75 sites were surveyed, 55 of which were first surveyed in 1994 and revisited in 2008 and 2019. Most of the field work for the third round of this project was performed during 2019 and concluded March 5, 2020.

Results

-Primary Objective: *Annual Monitoring*
The original eight paired sub-basins (30 sites) have been monitored routinely for population persistence for 27 years (Table 25). Overall, our monitoring results show that Southern Torrent Salamanders have persisted despite concerns of an apparent negative effect from the original sampling methodology. Over the span of the 27-year

monitoring period the sites have had an average of 87% larval occupancy, an average of 93% occupancy for any life history stage (e.g., larval, juvenile or adult) and 100% larval occupancy for each year surveyed at seven sites (Table 25). Over the years a handful of sites (e.g., Pollock A, Jiggs A & B) have shown inconsistencies in larval persistence at the sub-population level; however, Pollock A has had larval detections as recent as 2020. Jiggs A & B have been consistently occupied by post-metamorphic Southern Torrent Salamanders since 2009, and larval occupancy was confirmed at Jiggs A in 2024, while larval occupancy was last confirmed at Jiggs B in 2022 (Table 25).

-Secondary Objective: *Property-wide Occupancy Surveys*
Our initial property-wide Southern Torrent Salamander occupancy surveys in 1994 established a baseline occupancy rate of 80% (56 of 70 sites, any life history stage present; Diller and Wallace, 1996). This baseline threshold was met and exceeded during the 2008 (71 of 84 sites, 84.5%) and 2019 (64 of 76 sites, 84.2%) surveys (Table 26). When looking at larval occupancy, in 1994 occupancy was 70% (49 of 70 sites), 84.5% (71 of 84 sites) in 2008 and 82.9% (63 of 76 sites) in 2019 (Table 26). As a result of the property transactions mentioned in the introduction, there have been changes in the number of sites surveyed since 1994, with 56 of the original sites being surveyed all three rounds (Table 27). When looking at these 56 original sites, we see an increase in occupancy, as well as continued stability through the 2008 and 2019 surveys (Table 27). Additionally, when looking at the subset of sites surveyed in both 2008 and 2019, we see continued occupancy stability as well (Table 28).

Discussion

With the variety of site characteristics at our annual monitoring sites and varying survey methods, it is difficult to assess the exact causes of inconsistencies in larval occupancy at some of our annual monitoring sites; however, it appears that timber harvest under the AHCP has not had a significant negative impact on the percentage of sites occupied by larval Southern Torrent Salamanders, with an average occupancy rate of 85.0% (Table 25), which is higher than the baseline occupancy established during the property-wide occupancy surveys in 1994 (70%). Conversely, when looking at occupation of these annual monitoring sites by any life history stage of Southern Torrent Salamanders, we see a 93% occupancy rate. It is notable that out of 620 total larval occupancy surveys between 1998 and 2024, only 94 surveys (15.2%) resulted in no larval Southern Torrent Salamander detections. On surveys that had no larval Southern Torrent Salamander detections, 38.3% of the time (36 out of 94 surveys) at least one larval Coastal Giant Salamander or Coastal Tailed Frog was detected, reinforcing the fact that these sites are perennial and can support larval amphibians that require more than one year to achieve metamorphosis. Additionally, 60.6% of the time (57 out of 94 surveys) larval Southern Torrent Salamander were not detected, at least one post-metamorphic Southern Torrent Salamander was detected, indicating that these salamanders are continuing to use these sites as habitat. Only 2.9% (18 out of 620) of our annual surveys yielded zero aquatic obligate amphibian detections (e.g., Southern Torrent Salamanders (any LHS), larval Coastal Giant Salamanders or larval Coastal

Tailed Frogs). Out of our 30 monitoring sites, seven have had 100% larval Southern Torrent Salamander detections every year they were surveyed, and 18 sites have had 100% occupancy, either larval, post-metamorphic or both, every year they were surveyed. A detailed analysis is needed to determine the likely drivers that are influencing the results observed. Unintended consequences from the more intensive sampling (decreased habitat quality and declines in captures) from 1998 to 2003, resulted in the switch to “light-touch” presence/absence surveys. From 2004 to 2009 some sites were either not surveyed or surveyed every other year as an attempt to give the sites time to recover from the effects of the survey. Sites appeared to have recovered, and annual surveys were resumed in 2010. We have observed another decline in our larval Southern Torrent Salamander detections in more recent years at some sites and have reinstated biennial occupancy surveys. We will continue this sampling schedule into the future for this project.

With our property-wide occupancy surveys, we saw an increase in Southern Torrent Salamander occupancy rates (any life history stage) from 80% in 1994 to 84.5% in 2008, and essentially maintained that same rate (84.3%) in 2019 (Table 26). When looking only at larval occupancy, we also saw an increase in occupancy from 70% in 1994 to 84.5% in 2008 and only a slight decline to 82.9% occupancy in 2019 (Table 26), which is a difference of one less site having a larval Southern Torrent Salamander detection (although a post-metamorphic Southern Torrent Salamander detection did occur at this site). The increase in occupancy rates, especially larval occupancy, from the 1994 surveys is promising regarding the potential impacts of timber management on the persistence of the species. Diller and Wallace (1996) found that Southern Torrent Salamander presence was closely tied to the geological formation of the stream drainage. They observed that during the1994 surveys, Southern Torrent Salamander presence was closely tied to consolidated geologic regions and the small portion of stream habitats that Southern Torrent Salamanders were not found in, generally consisted of unconsolidated materials, which appears to be unfavorable to these salamanders. This was also observed during the 2008 and 2019 surveys, as Southern Torrent Salamanders were not detected in many of the same sites surveyed in 1994 that consisted of unconsolidated materials. Overall, it would appear that the protections afforded by the AHCP are contributing to the continued persistence of this species across GDRCo’s ownership.

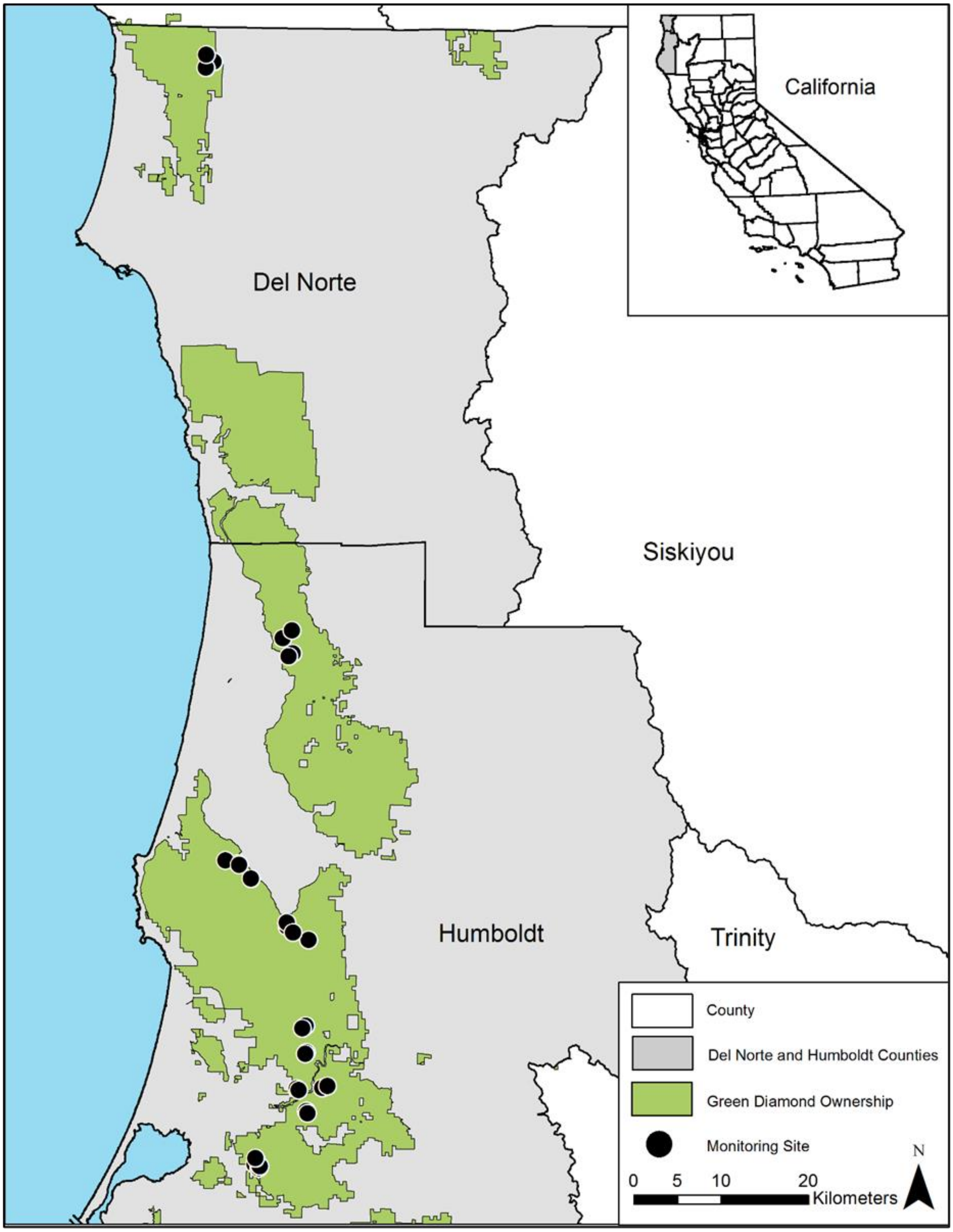


Figure 18. Locations of our Southern Torrent Salamander annual occupancy survey sites, Del Norte and Humboldt Counties, California (n = 30; some sites are overlapping at this scale).

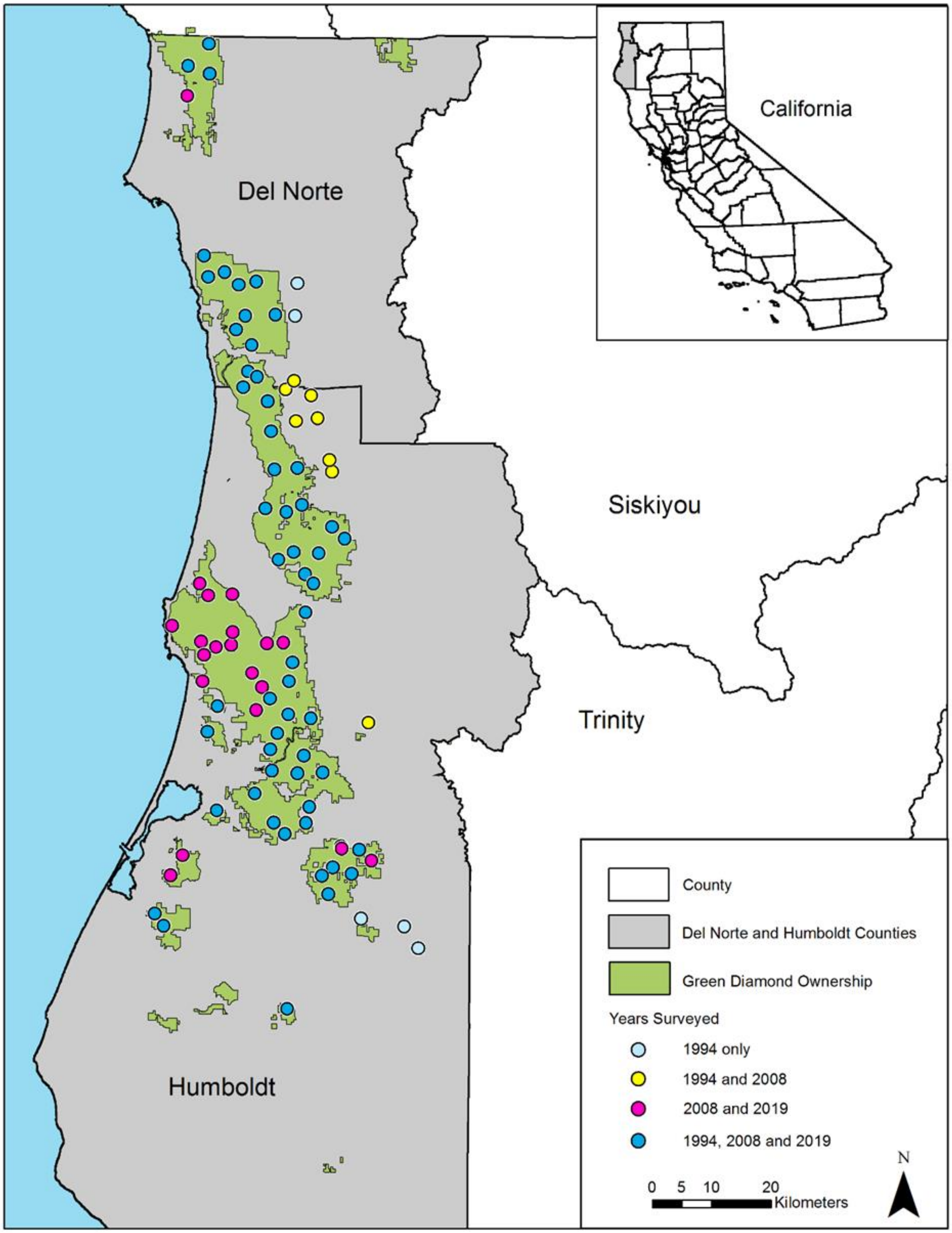


Figure 19. Locations of our larval Southern Torrent Salamander property-wide occupancy survey sites (1994, 2008 and 2019), Del Norte and Humboldt Counties, California.

Table 25. Southern Torrent Salamander annual larval occupancy survey sites with the number of sites surveyed, and percent occupied by year (1998-2024), including whether site had larval salamanders detected (Y/N) or was not surveyed (NS).

Site Name	Year 1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Number of Years Surveyed	% Years with Larval RHVA Detection	% Years with any RHVA LHS Detection
BlackDog 5300 A	Y	N*+	Y	Y	Y	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	22	95%	100%
BlackDog 5300 B	Y	Y	N*	N*+	N*	Y	NS	NS	NS	NS	N+	Y	Y	Y	Y	Y	Y	Y	N*	Y	Y	NS	Y	NS	Y	NS	Y	20	74%	95%
BlackDog 5400 A	Y	Y	Y	Y	Y	N+	NS	N*+	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	22	91%	95%
BlackDog 5400 B	Y	Y	Y	Y	Y	N*	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	22	95%	100%
Mule A	Y	Y	Y	Y	Y	N*	N	NS	N+	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	21	86%	90%
Mule B	Y	Y	Y	N*	N*	N	N	NS	N	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	21	76%	86%
Pollock A	Y	N*+	N*+	N*+	N	N	NS	N	NS	N+	N+	Y	N+	N+	N+	N	N*+	N+	N	N	Y	NS	Y	NS	N+	NS	N	22	18%	36%
Pollock B	Y	Y	Y	N*	Y	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	22	95%	100%
Poverty A	Y	Y	Y	Y	Y	N*	Y	NS	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	22	95%	100%
Poverty B	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	22	100%	100%
Jiggs A	Y	N*+	N*+	Y	N*	N	NS	NS	NS	NS	NS	Y	Y	Y	Y	Y	Y	Y	N*	Y	N*	NS	N*	NS	N*	NS	Y	19	58%	95%
Jiggs B	N*+	N*	N*	N*	Y	N*	NS	NS	NS	NS	NS	N*	N*	N*	N*	N*	Y	N*	N*	Y	N*	NS	N*	NS	Y	NS	N*+	19	21%	100%
Canyon A	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	22	100%	100%
Canyon B	Y	Y	Y	Y	N*	Y	NS	NS	NS	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	20	95%	100%
Panther CR2970A	Y	Y	Y	Y	N*	Y	Y	NS	NS	NS	NS	Y	Y	Y	Y	Y	N*	N*+	N*+	Y	Y	Y	NS	Y	NS	Y	NS	20	80%	100%
Panther CR2970B	Y	Y	Y	Y	N	Y	N	NS	N+	NS	Y	NS	N*+	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	21	81%	86%
Panther CR2960A	Y	Y	Y	Y	N+	N	N	NS	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	21	86%	86%
Panther CR2960B	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	21	100%	100%
NF Maple A	NS	Y	Y	Y	Y	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	21	100%	100%
NF Maple B	NS	N*+	N*+	Y	Y	Y	NS	N*	NS	N+	NS	N*+	Y	Y	Y	N+	Y	Y	N+	Y	Y	Y	NS	Y	NS	Y	NS	20	65%	85%
NF Maple C	NS	Y	Y	N+	Y	N+	NS	N	NS	N+	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	20	80%	80%
NF Maple D	NS	Y	Y	Y	Y	N	NS	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	20	95%	95%
Surpur B700	NS	NS	Y	Y	N*	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	20	95%	100%
Surpur 1042	NS	NS	N*	Y	N*	N*	NS	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	19	84%	100%
Surpur A400 A	NS	NS	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	19	100%	100%
Surpur A400 B	NS	NS	Y	Y	N*	N+	NS	Y	NS	Y	N*	Y	Y	Y	Y	N*+	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	Y	20	80%	95%
Rowdy R1700 A	NS	Y	Y	Y	Y	Y	Y	NS	N*	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	21	95%	100%
Rowdy R1700 B	NS	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	21	100%	100%
Rowdy R1000 A	NS	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	21	100%	100%
Rowdy R1000 B	NS	Y	Y	Y	Y	N*	Y	NS	Y	NS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NS	Y	NS	Y	NS	21	95%	100%
# of sites sampled	18	26	30	30	30	30	12	14	11	14	22	23	30	30	30	30	30	30	30	30	30	15	15	15	15	15	15			
# of sites occupied by RHVA larvae	17	21	24	24	19	16	8	10	7	11	19	21	27	28	28	26	28	27	24	29	28	15	13	15	13	15	13			
% sites occupied by RHVA larvae	94%	81%	80%	80%	63%	53%	67%	71%	64%	79%	86%	91%	90%	93%	93%	87%	93%	90%	80%	97%	93%	100%	87%	100%	87%	100%	87%	Avg. % occupied by larval RHVA: 85.0%		
% sites occupied by RHVA (any LHS)	100%	100%	100%	97%	90%	73%	67%	86%	73%	79%	90%	100%	97%	97%	97%	93%	100%	97%	93%	97%	100%	100%	100%	100%	93%	100%	93%	Avg. % occupied by RHVA (any LHS): 93.0%		

LHS = Life History Stage; * indicates juvenile or adult RHVA detected; + indicates larval *Dicamptodon tenebrosus* or *Ascaphus truei* detected at site.

Table 26. Comparison of property-wide Southern Torrent Salamander occupancy (LHS = life history stage).

Year	No. Streams Surveyed	% Occupied (any LHS)	% Occupied (Larvae)
1994	70	80.0	70.0
2008	84	84.5	84.5
2019	76	84.2	82.9

Table 27. Comparison of property-wide Southern Torrent Salamander occupancy amongst streams originally surveyed in 1994 and revisited in 2008 and 2019.

Year	No. Streams Surveyed	% Occupied (any LHS)	% Occupied (Larvae)
1994	56	78.6	67.9
2008	56	89.3	89.2
2019	56	89.3	87.5

Table 28. Comparison of property-wide Southern Torrent Salamander occupancy amongst streams surveyed in 2008 and 2019.

Year	No. Streams Surveyed	% Occupied (any LHS)	% Occupied (Larvae)
2008	76	82.9	82.9
2019	76	84.2	82.9

4. Road Treatment Implementation and Effectiveness Monitoring

Objective

The objectives of this monitoring program are to ensure that site specific road treatment prescriptions were implemented as designed, monitor the effectiveness of road treatment prescriptions, and attempt to improve road management measures when deficiencies are identified.

Project Status

In accordance with the minor modification approved on June 15, 2011, the AHCP effectiveness monitoring programs for road-related surface erosion monitoring (AHCP Section 6.3.5.2.4) and road-related mass wasting monitoring (AHCP Section 6.3.5.4.1) were substituted with the monitoring program required under the MATO and RMWDR. Under the programmatic permits, each completed activity must be inspected twice to evaluate the implementation and effectiveness of the completed treatment, once prior to the winter period and once following a full winter. If the site has stabilized and there is no reasonable potential for significant sediment delivery, then future monitoring will coincide with the Routine Maintenance Inspection Program (AHCP Section 6.2.3.9).

Results

A combined total of 752 road sites were monitored in 2023 and 2024 as part of road treatment implementation and effectiveness monitoring for road sites enrolled in the MATO. The results of the individual road site inspections for 2023 and 2024 are provided in Appendix B. All road sites were monitored by the AHCP road staff, RPF staff and contract supervisors. Four of 433 sites (0.92%) required or will require follow-up monitoring, treatment or maintenance after post-winter assessments (Table 29). In addition to the required pre- and post-winter inspections, GDRCo personnel perform incidental inspections during the winter period.

The process of road treatment monitoring involves staff entering results of inspections into the road database and reports are generated showing the site, THP number associated with the site, date of pre- and post- inspection, whether the site meets AHCP standards and any comments regarding the condition of the site. The number of pre-winter inspections should be equal to the number of post-winter inspections for the year. The exception would be sites that require follow-up treatments or maintenance as they may have additional inspections. Variable data recording standards among staff resulted in inaccurate reporting. To improve accuracy of the reports, RPF staff and AHCP road staff were given additional field and database training and field inspection forms were updated in

May 2015. In addition, changes to the road database were made to link site completion dates to inspection data to ensure when a site is complete, staff can be notified to perform a pre-winter inspection. These changes did not have the intended effect of greater accuracy. In January 2016, the AHCP Roads group was moved into the Operations Department. As a result of added exposure to contract administration and the continued issues with collecting effectiveness monitoring data, the decision was made to focus only AHCP Road technician staff on data collection and data entry. Further refinements occurred in April 2017 to ensure road contractor invoices are received with specific information on completed road work to assist in scheduling site visits to collect data. Internal discussions related to this issue speculate that site visits are likely taking place according to protocols and any issues identified are being addressed but are not always being documented which results in incomplete annual summaries. Improvements in communication and data collection between Contract administrators collecting completion data and AHCP Roads inspectors entering completion data are ongoing. In 2023 the ACHP Roads group began tracking and reporting non-compliant MATO sites outside of the roads database system to ensure additional inspections are completed. This information is reported in the Annual Work Plan Report for the MATO and has been added to Appendix B.

Table 29. Summary of monitoring efforts completed for the road treatment implementation and effectiveness monitoring from 2010 through 2024.

Assessment Type	Year	Assessments Completed	Maintenance Issues Recorded
Pre-Winter	2010	25	0
Post-Winter	2011	25	5
Pre-Winter	2011	244	1
Post-Winter	2012	244	2
Pre-Winter	2012	348	0
Post-Winter	2013	309	2
Pre-Winter	2013	234	0
Post-Winter	2014	259	0
Pre-Winter	2014	334	0
Post-Winter	2015	146	0
Pre-Winter	2015	186	0
Post-Winter	2016	188	11
Pre-Winter	2016	220	1
Post-Winter	2017	214	8
Pre-Winter	2017	262	3
Post-Winter	2018	262	1
Pre-Winter	2018	137*	1
Post-Winter	2019	137	0

Pre-Winter	2019	148	0
Post-Winter	2020	148	1
Pre-Winter	2020	208	0
Post-Winter	2021	192	1
Pre-Winter	2021	282	0
Post-Winter	2022	288	1
Pre-Winter	2022	244	0
Post-Winter	2023	145	3
Pre-Winter	2023	145	2
Post-Winter	2024	NA	NA
Pre-Winter	2024	319	8

*Previous Biennial Report included an erroneous figure due to a summing function issue with the data and has been corrected here.

B. Response Monitoring

The Response Monitoring projects, like the Rapid Response projects described above, monitor the effectiveness of the conservation measures in achieving specific biological goals and objectives of the AHCP. These monitoring projects are distinguished from the Rapid Response projects by the greater lag time required for feedback to the adaptive management process. The Response Monitoring projects are focused on the effects of cumulative sediment inputs on stream channels. Natural variability in stream channel dimensions, combined with the potential time lag between sediment inputs and changes in the response variables of these projects, make it difficult to determine appropriate thresholds for adaptive management at this time. When yellow and/or red light thresholds are determined, they are expected to require more than three years of results to be triggered in most cases.

1. Class I Channel Monitoring

Objectives

The objective of the Class I Channel Monitoring project is to track trends in sediment inputs in fish-bearing streams as evidenced by changes in surface particle size distributions and metrics associated with the longitudinal channel profile including overall aggradation and degradation. This monitoring approach is based on the fundamental premise that selected depositional reaches within a watercourse act as a response surface for sediment that has been transported downstream from the hillside via the upper high gradient transport stream reaches. The long-term channel monitoring project is not designed to identify the potential sources or causes of changes in the sediment budget, only to document if they are occurring. These changes are currently monitored using thalweg longitudinal profiles and pebble counts. This channel monitoring technique is generally best suited for establishing long term trends due to the potential lag times between sediment inputs and the measured response in the monitoring reach.

Class I channel monitoring is a complex study, and most likely a completely new analysis will need to be designed in order to develop thresholds. As described in AHCP Section 6.3.5.3.1, it is estimated that it will take approximately ten to fifteen years of initial trend monitoring before the appropriate thresholds can be developed and applied.

Project Status

This monitoring program is operational, ongoing, and data analysis is in progress. This monitoring effort began as a pilot study in 1993-1994, was implemented at the first site in 1995, and by 2008 the number of study sites increased to 12 streams. One additional site (North Fork Mad River) has been studied using the channel monitoring protocol and was included in past biennial reports but this site was not intended to be part of the AHCP Response monitoring and will no longer be associated with this project.

The protocol implemented for this monitoring project has undergone modifications to the collection methods, parameters collected, and sampling schedule over the years. Minor modifications to the original Class I Channel Monitoring protocol (see AHCP Appendix D.2.2.2) were proposed to the Services in the March 2011 request for Minor Modifications. A summary and justification for the requested modifications were provided in the 2nd Biennial Report (GDRCo 2011a) and the 2011 modifications request, respectively. The intent of this request was to update the protocol to reflect the current monitoring efforts being implemented for this project. After review and consideration, the Services concurred with the proposed modifications and requested the revised protocol be provided for review and approval. In August 2011, the Services were provided with the revised protocol for this monitoring program. No revisions were requested by the Services and the revised protocol was implemented for this monitoring program through 2014.

In late 2014, we initiated the process of analyzing data collected through the 2014 sampling season and in September 2016 a morphometric based evaluation of the data was presented at the 2016 Coast Redwood Science Symposium. Quantile regression was used to evaluate trends in size distributions of bed surface substrate measured at riffle crossovers. Trends in the longitudinal profiles of each site were also evaluated. We first normalized the longitudinal survey data by creating an average profile to spatially align each year’s survey data. This process controlled for annual changes in stream sinuosity which can affect the overall length and gradient of the surveyed channel. Efforts to combine long-profile data collected pre-2002 (i.e., collected with original methods) with post-2001 data were attempted but these different data proved to be incompatible and the identified issues could not be resolved. Some of the challenges with combining these data were described in the 3rd Biennial Report (GDRCo 2013). Based on this assessment, we concluded that the pre-2002 long-profile and cross-section data would not satisfy the study objectives and these data have been excluded from the analysis at this time.

During analysis of the Class I Channel Monitoring data, as anticipated in the 4th Biennial Report (GDRCo 2015a), modifications to the revised protocol were initiated prior to the 2015 season and implemented through 2024. Collection of cross-section and roughness coefficient (Manning's) data were discontinued. Both of these data were found to be inadequate to evaluate the parameters and meet the monitoring objectives of this study. The modifications also included adding a way to delineate upstream and downstream extents of pool habitats from other depressions in the longitudinal profile. This allows for a more robust comparison of pool habitat metrics (e.g., count; maximum and average depth; and longitudinal area). Also, additional thalweg points are now obtained in conjunction with the standard ten-foot measurement intervals. This allows for more accurate longitudinal representation of the upstream and downstream extents of pool habitat features and channel sinuosity. These additional thalweg points are coded in the data so that current data can still be compared to previous years when thalweg points were strictly collected at ten-foot increments. Green Diamond continues to monitor both substrate particle size and longitudinal profiles for the 12 long term monitoring reaches with plans to investigate and develop thresholds that will be used to evaluate the effectiveness of the Plan.

<u>**Results**</u>

To date, twelve Class I Channel Monitoring sites have been established and routinely monitored for up to thirty years (Table 30). On average, sites have been sampled 25.4 times and the monitoring duration has spanned 27.3 years. Cañon Creek is the site with longest record (thirty years) of continuous monitoring.

Analysis of the pebble count data through 2014 indicate a statistically significant positive trend in the coarsening of substrate particles across the entire size class distribution for 11 of the 12 stream reaches throughout the monitoring period (Table 30). Beach Creek was the one site that had a statistically significant decrease in a larger size class (e.g. Tau 0.84) but experienced coarsening in the smaller size classes (e.g. Tau 0.16 and Tau 0.50). In quantile regression, Taus represent individual specified quantiles. Tau 0.16 represents a diameter of particles where 16% of the sediment in the sample is smaller (this is also often represented as a D16). The quantile regression slopes shown in Table 31 are the annual rates of change in particle sizes at the specified Taus. For example, in Tectah Creek, the particle size at the 16th percentile is increasing over time by 1mm per year.

Analysis of the longitudinal profile data through 2014 indicate that 5 sites had a statistically significant decrease in bed elevation, 2 sites had a statistically significant increase in bed elevation, and 6 sites had no statistically significant change in bed elevation over the study period (Table 32).

Discussion

Analysis of the pebble count data indicates that all of the reaches are exhibiting a reduction in fine sediment inputs. In fact, there was a trend in coarsening across the entire range of particle sizes for all sites except Beach Creek. Beach Creek did exhibit a reduction in substrate size however it occurred only in the larger particle size classes which we expect would not have a negative effect on fish spawning success. Examination of the longitudinal profile data indicate that at 85% of the study reaches the streambed is either stable or downcutting.

Over the course of the study period there have been improvements in forest management practices including the application of measures designed to minimize fine and course sediment inputs such as enhanced riparian protections, geologic prescriptions and extensive road upgrading and decommissioning activities as part of GDRCo’s AHCP. The results of this study indicated that the implementation of these measures has been effective in reducing the amount of sediment delivered to watercourses as evidenced by the general overall trend in coarsening of the substrate and lowering or no change in the bed elevation.

GDRCo intends to analyze the pebble count and longitudinal profile data to include the most recent data in the same manner as was completed in 2014. These results will be shared with the Services when available and are expected to assist with the establishment of threshold values for this monitoring project.

Table 30. Summary of Class I Channel Monitoring survey efforts conducted by Green Diamond from 1995-2024 (Y = site was surveyed, N = site was not surveyed).

Site Name	# Years Monitored	Monitoring Duration	Year																													
			1995	1996	1997	1998	1999	2000	2001	2002 [1]	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015 [2]	2016	2017	2018	2019	2020	2021	2022	2023	2024
Cañon Creek	30	30	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hunter Creek #1	28	29		Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Salmon Creek	26	29		Y	Y	Y	N	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Canyon Creek	26	29		Y	Y	N	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SF Winchuck River	25	29		Y	Y	N	Y	N	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hunter Creek #2	27	28			Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Tectah Creek	25	28			Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Beach Creek	24	27				Y	Y	N	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Maple Creek	25	27				Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ah Pah Creek	23	24							Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SF Ah Pah Creek	23	24							Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Little River	23	23								Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Number of sites		-	1	5	7	7	7	5	10	10	12	5	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	12

Blank cells represent years prior to site being developed for survey protocol.

[1] Field protocol modified to utilize total station and discontinue bank full channel dimensions.

[2] Field protocol modified to discontinue cross sectional and roughness coefficient surveys.

Table 31. Summary of pebble count quantile regression analysis. Data used was collected by Green Diamond from 1995-2014.

	Quantile Regression Slope[1]			Tau 0.16		Tau 0.50		Tau 0.84	
Site Name	Tau 0.16	Tau 0.50	Tau 0.84	Lower 95% CI	Upper 95% CI	Lower 95% CI	Upper 95% CI	Lower 95% CI	Upper 95% CI
Cañon Creek	1.571	1.909	2.118	1.50	1.67	1.80	2.00	1.89	2.26
Hunter Creek #1	1.111	1.167	0.800	1.00	1.18	1.00	1.29	0.57	1.07
Salmon Creek	1.286	1.500	1.600	1.20	1.40	1.36	1.63	1.40	1.80
Canyon Creek	0.900	1.438	2.000	0.81	1.00	1.30	1.56	1.75	2.20
SF Winchuck River	1.143	1.200	0.727	1.07	1.22	1.11	1.33	0.54	0.92
Hunter Creek #2	1.600	1.900	2.125	1.50	1.71	1.76	2.00	1.91	2.38
Tectah Creek	1.000	1.250	1.091	0.91	1.14	1.13	1.42	0.90	1.33
Beach Creek	0.375	0.154	-0.333	0.25	0.53	0.00	0.33	-0.50	-0.08
Maple Creek	0.933	1.400	1.538	0.90	1.00	1.33	1.50	1.38	1.67
Ah Pah Creek	0.818	1.200	1.000	0.67	1.00	1.10	1.36	0.80	1.31
SF Ah Pah Creek	1.636	2.125	3.273	1.50	1.80	2.00	2.33	3.00	3.63
Little River	1.333	1.667	2.000	1.13	1.60	1.44	2.00	1.71	2.67

Superscript definition: 1 = In quantile regression Tau's represent individual specified quantiles. A Tau 0.16 represents a diameter of particles where 16% of the sediment in the sample is smaller (this is also often represented as a D16). The quantile regression slopes shown here are the annual rates of change in particle sizes at the specified Taus. For example in Tectah Creek, the particle size at the 16th percentile is increasing over time by 1mm per year.

Table 32. Summary of longitudinal profile data aggradation/scour analysis. Data used was collected by Green Diamond from 2002-2013.

Site Name	Slope (m/yr)	Significant?	p-value	Overall channel elevation change from 2002 to 2013 (m)
Cañon Creek	-0.0171	Yes	0.0003	-0.232
Hunter Creek #1	-0.0043	No	0.6250	-0.146
Salmon Creek	0.0057	No	0.1016	0.016
Canyon Creek	-0.0379	Yes	0.0006	-0.413
SF Winchuck River	0.0017	No	0.8137	0.126
Hunter Creek #2	-0.009	No	0.2170	-0.157
Tectah Creek	0.0002	No	0.9697	-0.119
Beach Creek	0.0039	Yes	0.0479	0.040
Maple Creek	-0.013	Yes	0.0014	-0.121
Ah Pah Creek	-0.0119	Yes	0.0060	-0.161
SF Ah Pah Creek	-0.0096	Yes	0.0000	-0.104
Little River	0.0038	Yes	0.0456	0.079

2. Class III Sediment Monitoring

Objective

The objective of the Class III sediment monitoring was to quantify the amount of sediment delivered from Class III channels following timber harvest. This monitoring project was designed to test the null hypothesis that sediment delivery does not significantly change in Class III channels following timber harvest operations along Class III channels. To satisfy this objective, multiple methodologies were originally employed (i.e., channel morphology, sediment tray, turbidity monitoring, and sediment basins) to assess and quantify sediment delivery and test the hypothesis using a BACI study design.

Project Status

The protocol implemented for this monitoring project has undergone modifications to the collection methods and parameters collected over the years. Three of the methodologies originally proposed in the AHCP (i.e., channel morphology, sediment tray, and turbidity monitoring) were discontinued in 2011 and the remaining methodology that utilized sediment basins was suspended in 2014. A brief summary of these changes and current status is provided below.

Minor modifications to the original Class III sediment monitoring protocol (see AHCP Appendix D.2.3) were proposed to the Services in the March 2011 request for Minor Modifications. A summary and justification for the requested modifications were provided in the 2nd Biennial Report (GDRCo 2011a) and the 2011 modifications request, respectively. The intent of this request was to update the protocol to reflect the current monitoring efforts being implemented for this project and improve the study design for this monitoring program. After review and consideration, the Services concurred with the proposed modifications and requested the revised sampling design be developed with the Services prior to future sampling. On July 24, 2012, the Services were provided with the revised protocol for the monitoring project and updated on the status. No revisions were requested by the Services and the revised protocol was implemented through the 2014 sampling season. In May 2017, GDRCo provided the Services with a proposal to suspend the Class III sediment monitoring project based on the review of the data and the associated challenges with implementing the monitoring project. On February 13, 2018, GDRCo met with the Services to review and discuss the proposal.

Issues were experienced in 2013 and 2014 with the newest paired sites and no new additional sites have been established since then. The challenges we experienced included difficulties identifying suitable paired sites, coordinating the timing of harvest, ensuring that planned treatments were implemented during harvest, and preventing damage to sediment basins during harvest operations. These challenges have highlighted the need to suspend this monitoring project until a new study methodology can be identified. We had discussions with the Services about the future objective, threshold/trigger, and protocol associated with this monitoring project. All monitoring associated with this project has been suspended at this time.

C. Long-Term Trend Monitoring

The Long-term Trend Monitoring projects are those monitoring projects for which no thresholds for adaptive management are set. For some projects, this reflects the multitude of factors which affect the response variables, in others, the long time-scales required to distinguish the 'noise' from the underlying relationships. Research projects designed to reveal relationships between habitat conditions and long-term persistence of the Covered Species are also included in this section. Each of these projects has the potential to provide feedback for adaptive management, but in some circumstances, decades may be required before that can occur.

1. Long-Term Habitat Assessment

Objectives

In 2018, GDRCo completed its third round of property wide Long-Term Habitat Assessments. This project has been conducted approximately every ten years, beginning in 1994 and in 2007 it became part of the Effectiveness Monitoring Program under the approved AHCP. The objective of the Long-Term Habitat Assessment is to document trends in fish habitat quality and quantity over time on anadromous stream reaches located throughout GDRCo's California timberlands. As we get further into the life of the AHCP, these trends will be valuable for comparison with the results of the other, more specific monitoring projects to ensure that the individual biological objectives described elsewhere (i.e., channel morphologies, water temperature, etc.) are accurately capturing the larger picture of overall aquatic stream health and function.

Project Status

This project was initiated by GDRCo in 1994 and has been conducted approximately every ten years (Table 33). It takes crews approximately 3 years to complete each round of surveys. Three full assessments have been completed. A total of 58 streams were originally surveyed within the GDRCo ownership by various organizations, both public and private. Two creeks located within the Coastal Klamath Hydrographic Planning Area (HPA) that were surveyed in the first and second assessments, Bear Creek and WF Blue Creek, were not sampled during the third assessment. Both of these watersheds were sold as part of land transactions with the Yurok Tribe and are no longer owned by GDRCo. Three creeks within the Eel River HPA, Wilson, Stevens and Howe Creeks were surveyed by California Department of fish and Game during the first round of surveys but were not surveyed by GDRCo during the second and third assessments. The second and third assessments, initiated in 2005 and 2015, were conducted solely by GDRCo on 53 and 51 streams, respectively.

Table 33. Summary of the three habitat typing assessment efforts by HPA.

	1st Assessment 1991-1998		2nd Assessment 2005-2008		3nd Assessment 2015-2018	
HPA	**No. streams**	**Miles**	**No. streams**	**Miles**	**No. streams**	**Miles**
Smith River	4	23.0	7	24.9	7	25.6
Coastal Klamath	22	87.8	17	69.6	16	65.5
Blue Creek	4	21.6	1	4.5	0	0.0
Interior Klamath	11	30.2	3	20.5	3	17.7
Redwood Creek	0	0.0	0	0.0	0	0.0
Coastal Lagoons	0	0.0	7	28.3	8	30.4
Little River	4	18.0	8	23.6	7	25.6
Mad River	3	11.3	3	7.1	3	7.0
NF Mad River	2	18.0	5	21.1	5	20.7
Humboldt Bay	4	14.1	2	13.5	2	13.7
Eel River	4	5.8	0	0.0	0	0.0
TOTALS	**58**	**229.9**	**53**	**213.2**	**51**	**206.2**

<u>Methods and Results</u>

During the initial surveys, channel and habitat typing assessments were conducted using CDFW methods described by Flosi and Reynolds (1994) and during the second and third assessments under the revised CDFW methods described by Flosi et al (2002). The primary changes involved the addition of classifications in some measurement categories, and the upgrade from the DOS-based Habitat 8 program to a Microsoft Access based Stream Habitat program, used for summarization and reporting of results. Refer to The California Salmonid Stream Habitat Restoration Manual, Flosi and Reynolds (1994) and Flosi et al (2002) for a complete description of methodologies. Prior to the onset of assessments, GDRCo's aquatic field technicians participated in a four-day training seminar sponsored by CDFW in order to become familiar with the methodology. During the channel and habitat assessments the following variables were collected: percent canopy cover, structural shelter for all pool habitats, habitat types as a percent of length, pool-tailout embeddedness and maximum residual pool depths these data are intended to provide information about the health of streams, especially with regard to salmonid habitat, across the California ownership. Summaries of the Long-Term Habitat Assessment monitoring efforts completed to date have been provided in the 1st and 2nd and 7th Biennial Reports (GDRCo 2009; GDRCo 2011a; GDRCo 2021a). No new results are available at this time.

2. LWD Monitoring

Objectives

The importance of Large Woody Debris (LWD) on the health of a stream and its direct relationship to healthy salmonid populations has been well documented. Instream LWD provides cover habitat which benefits salmonids at multiple life stages throughout the year. LWD also interacts with the streambed creating pools and altering the channel in a way that provides fish with improved more complex habitats. These habitats can offer cooler water temperatures and improved cover from predators. The objectives of the project are to document long-term trends in the abundance, size class, species and function of in-channel LWD under the AHCP. The development of potential LWD in riparian areas throughout the Plan Area is relatively predictable. Collectively, the conservation measures are expected to increase potential LWD over the life of the AHCP. However, the recruitment of potential LWD into the stream (i.e., in-channel LWD) is less predictable because it results from highly stochastic processes which occur over long time scales. For this reason, the LWD Monitoring does not lend itself to develop measurable thresholds for adaptive management. This monitoring project will document whether the expected increase of LWD to the riparian areas will result in an increase to in-channel LWD.

This study is integrated into the long-term habitat assessment study and is designed for the same Class I streams to be assessed every ten years. As such, it takes approximately five years to complete each round of assessment. LWD summaries on average piece count and volume per 100 feet were generated to better understand how the conservation measures of the AHCP are performing with regard to LWD within the stream channel.

Project Status

The LWD monitoring program is operational and ongoing. Surveys are initiated on a ten-year interval. The second round of monitoring, conducted from 2005-2009, implemented a modified sampling protocol described in the AHCP (AHCP Appendix D.3.7.2). Details on the differences between the parameters collected and sampling designs were provided in the 2nd Biennial Report (GDRCo 2011a).

The third round of LWD monitoring, similar to the second round, began in 2015 and was completed in 2018.

Methods and Results

Surveys completed during the first assessment utilized the methods described by Flosi and Reynolds (1994). This sampling design was intended to be a more rapid assessment with the objective of quickly identifying stream reaches lacking in LWD for prioritizing restoration projects. LWD was categorized into 8 size classes and then averaged per 100 feet of stream channel. Volume per 100 feet was also calculated for the second and third assessments, but not for the first due to different sampling techniques. Details on function, origin, and total volume were not collected in the 1990's. During 2005 and 2015 the methodologies presented in the revised Flosi et al 2002 were used. This is a survey where pieces are counted, measured, and classified within a given reach (20% surveys) or for the entire anadromous stream length (100% surveys). Regardless of sample design, all LWD ≥0.5 feet in diameter and ≥ 6 feet in length within the sample reach are inventoried. This provides a comprehensive and repeatable measure of abundance, volume, distribution, origin, species and functionality for all in-channel LWD. Live trees and LWD within the "recruitment zone," are no longer included in the surveys.

Summaries of the Long-Term LWD monitoring efforts completed to date have been provided in the 1st and 2nd and 7th Biennial Reports (GDRCo 2009; GDRCo 2011a; GDRCo 2021a). No new results are available at this time.

3. Summer Juvenile Population Estimates

Summer Juvenile Population Estimates

<u>Objectives</u>

The objectives of the summer population estimates are to estimate summer populations of young-of-the-year (YOY) coho salmon, and age 1+ and older (parr) steelhead and cutthroat trout, and to track trends in these populations over time. In the Little River HPA, the population estimate information may be combined with outmigrant trapping data in an attempt to understand the mortality associated with specific life-history stages (particularly over-winter survival). This study is a long-term trend monitoring project, and has no associated thresholds. As enough data are acquired, it will be possible to conduct a trend analysis associated with other monitoring projects discussed in the AHCP.

<u>Project Status</u>

This monitoring program is operational and ongoing. The number of creeks sampled has changed over time from three in 1995 to a high of fifteen through 2014. Currently, there are eleven summer juvenile population estimate monitoring sites established that have been routinely monitored (Table 34). An additional nine sites were briefly monitored but discontinued due to their unsuitability for the study objectives. Additional details on justification for discontinuing these sites were provided in the 2nd Biennial Report (GDRCo 2011a) and 4th Biennial Report (GDRCo 2015a).

The original field protocol has also been slightly modified from the protocol described in the AHCP (AHCP Appendix D.3.8). There have also been modifications to the sampling design and habitat classification over the years as well as to the estimators used to calculate annual salmonid population estimates. An update to the original Summer Juvenile Population Estimate Monitoring protocol was proposed to the Services in the March 2011 request for Minor Modifications. Details and justifications for the requested modifications were provided in the 2nd Biennial Report (GDRCo 2011a). The intent of this request was to update the protocol to reflect the current monitoring efforts being implemented for this project. After review and consideration, the Services concurred with the proposed update to the monitoring protocol. In 2012, the Services were provided with the revised protocol for this monitoring program. No revisions were requested by the Services and the revised protocol has been implemented since.

A functional data management system is established and operational for this project. All historical data has been incorporated into this database and these data have been audited for quality assurance/quality control. Juvenile salmonid population estimates are generated annually using custom reporting functions and the results are reported to NMFS and CDFW in accordance with permit requirements.

On average, the current monitoring sites have been sampled 24.5 times and the monitoring duration has spanned 24.7 years. Wilson Creek and South Fork Winchuck River are the sites with the longest continuous monitoring efforts; both have been monitored for the last 30 years. Detailed information on this project can be obtained from Appendix C which is GDRCo’s 2024 Summer Juvenile Salmonid Population Sampling Program annual report to NMFS. This report summarizes the results from the 2024 survey season and compares select variables to historical data

Table 34. Summary of the summer juvenile population estimate survey efforts conducted by Green Diamond from 1995-2024 (Y = site was surveyed, N = site was not surveyed).

Site Name	# Years Monitored	Monitoring Duration	Monitoring Year																													
			1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
SF Winchuck River	30	30	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Wilson Creek	30	30	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cañon Creek	29	30	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hunter Creek	27	27				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Lower SF Little River	27	27				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Railroad Creek	17	17				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N
Upper SF Little River	27	27				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sullivan Gulch	26	26					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SF Rowdy/Savoy Cree	24	24							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
EF Hunter Creek	14	14									Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N
Heightman Creek	9	10											Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N
Ah Pah Creek	18	18													Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SF Ah Pah Creek	18	18													Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Little Surpur Creek	13	15																	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Tarup Creek	3	3																		Y	Y	Y	N	N	N	N	N	N	N	N	N	N
Moon Creek	3	3													Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
NF Ah Pah Creek	2	2													Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Lower Beach Creek	1	1												Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Lower Maple Creek	1	1												Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Upper Maple Creek	1	1												Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Number of sites	-	-	3	3	3	6	8	8	9	9	10	10	11	13	15	15	14	13	14	15	15	15	11	11	11	11	11	11	10	11	11	11

Blank cells represent years prior to site being developed for survey protocol.

4. Outmigrant Trapping

Objectives

The objectives of the outmigrant trapping project are to monitor the abundance, size, and timing of out-migrating salmonid smolts and look for long-term trends in any or all of these variables. This information may be used to estimate overwinter survival of juvenile coho cohorts by comparing outmigrant abundance to the previous summer population estimates.

Project Status

The outmigrant trapping monitoring program is operational and ongoing. The number of creeks monitored has changed over time. In 1999, three tributaries were selected in Little River followed by a fourth in 2000. In 2004, one additional site was selected in Ryan Creek. In 2015, two sites were discontinued: the site in Ryan Creek and the Railroad Creek site (one of the tributary sites in Little River). In 2015, one additional site was selected on Mainstem Little River, bringing the total to four sites monitored in Little River from 2015 to 2022. In 2023, three of the tributary sites were discontinued: Carson Creek, Lower South Fork Little River (LSFLR) and Upper South Fork Little River (USFLR). Mainstem Little River is currently the only site being monitored for outmigrant trapping.

The original field protocol implemented for this monitoring program is described in the AHCP (AHCP Appendix D.3.9) and has undergone minor changes with the addition of the site on Mainstem Little River, the discontinuation of the Ryan Creek, Railroad Creek, Carson Creek, LSFLR and USFLR sites. An update to the original outmigrant trapping protocol was proposed to the Services in the March 2011 request for Minor Modifications and again in August 2023. Details and justifications for the 2011 requested modifications were provided in the 2nd Biennial Report (GDRCo 2011a) and the 2011 modifications request, respectively. Details and justifications for the 2023 requested modifications were provided in the 9th Biennial Report (GDRCo 2024a) and the 2023 modifications request, respectively. The intent of both requests was to update the protocol to reflect the current monitoring efforts being implemented for this project. After review and consideration, the Services concurred with the proposed update to the monitoring protocol. On July 24, 2012, the Services were provided with the revised protocol for this monitoring program. No revisions were requested by the Services and the revised protocol was implemented for this monitoring program through 2024. As described above, there were changes to the sites monitored for this project as well as a few changes to procedures related to scientific collecting permit limitations.

A database was developed which stores and summarizes data for estimates and reports. All historical data have been incorporated into this database and smolt estimates are generated annually for the sites, the results of which are reported to NMFS and CDFW in accordance with permit requirements. This study is a long-term trend monitoring project and does not have associated thresholds. As enough data are acquired, it will be possible to conduct a trend analysis associated with other monitoring projects discussed in the AHCP. Currently, one outmigrant trapping site is established and annually monitored (Table 35). Among the trapping sites that have been monitored historically, the Mainstem Little River site has been monitored for the shortest period. Detailed information on this project can be obtained from Appendix D which is GDRCo’s 2024 Juvenile Salmonid Outmigrant Trapping Program – Little River annual report to NMFS. This report summarizes the results from the 2024 trapping season and compares select variables to historical data.

Table 35. Summary of the outmigrant trapping efforts conducted by Green Diamond from 1995-2024.(Y = site was surveyed, N = site was not surveyed).

			Monitoring Year																									
Site Name	**Watershed**	**# Years Monitored**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Upper SF Little River	Little River	25	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
Lower SF Little River	Little River	25	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
Railroad Creek	Little River	16	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N
Carson Creek	Little River	24		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
Mainstem Little River	Little River	10																	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ryan Creek	Ryan Creek	11						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N
Number of sites		-	3	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	1	1

Blank cells represent years prior to site being developed for survey protocol.

5. Turbidity Threshold Sampling

<u>Objective</u>

In 2024, Green Diamond Resource Company (GDRCo) completed its twenty-third year of Turbidity Threshold Sampling (TTS) at stream locations distributed across the California ownership (Figure 20). This monitoring project began in 2002 at three locations in Little River and in 2007 became part of the Effectiveness Monitoring Program under an approved Aquatic Habitat Conservation Plan (AHCP, (GDRCo, 2006)). The purpose of the Effectiveness Monitoring Program is to track the success of the AHCP conservation program in relation to the biological goals and objectives and provide a basis for adaptive management. The objectives of the TTS monitoring stations are to collect continuous stage, continuous turbidity, and water samples (to measure suspended sediment concentration (SSC)) throughout each water year (October 1 through July 1). These data can be used to help detect trends that may indicate changes in the levels of erosion at the watershed scale upstream of each station, and to calculate suspended sediment loads by establishing a relationship between SSC and turbidity for a sampling period of interest. These data can also be integrated into existing monitoring projects as hydrologic explanatory variables, including watershed scale assessment of the effectiveness of the mitigation measures of the AHCP especially regarding road building, road upgrading, road decommissioning, logging and truck hauling (logs and equipment).

Project Status

This monitoring program is operational and ongoing but has been separated from the road-related surface erosion monitoring program (AHCP Section 6.3.5.2.4). This change was approved by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) through a minor modification to the Effectiveness Monitoring Program approved on June 15, 2011. This project was retained as a long-term monitoring project under the Effectiveness Monitoring Program. The TTS monitoring effort began in the water year (WY) 2002 at three sites in Little River, was up to 15 sites during WY 2013 and 2014 and has settled at 11 sites for the 2024 water year (Table 36).

Table 36. Summary of the turbidity threshold sampling efforts (Y = yes, protocol implemented) conducted by Green Diamond Resource Company during the 2002-2024 water years.

		Station	# of Years	Water Years Protocol Implemented (20XX)																						
Watershed	Stream Name	Code	Monitored	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Little River	Lower South Fork Little River	LSF	24	Y*	Y*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Little River	Upper South Fork Little River	USF	24	Y*	Y*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Little River	Railroad Creek	RR	13	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-
Little River	Carson Creek	CC	23	-	Y*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Humboldt Bay	Ryan Creek	RC-1	12	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-
Maple Creek	Mainstem Maple Creek	MSM	21	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Maple Creek	North Fork Maple Creek	NFM	21	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Humboldt Bay	McCloud Creek	MC2	19	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ah Pah Creek	Mainstem Ah Pah Creek	MSAP	18	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ah Pah Creek	North Fork Ah Pah Creek	NFAP	7	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-
Ah Pah Creek	South Fork Ah Pah Creek	SFAP2	18	-	-	-	-	-	-	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	Y	Y	Y	Y	Y	Y	Y	Y
Winchuck River	South Fork Winchuck River	SFW	18	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Redwood Creek	Panther Creek	PAN	3	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	-	-	-	-	-	-	-	-	-	-
Klamath River	Tarup Creek	TAR	2	-	-	-	-	-	-	-	-	-	-	-	Y	Y	-	-	-	-	-	-	-	-	-	-
Tectah Creek	East Fork Tectah Creek	EFT	11	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Tectah Creek	West Fork Tectah Creek	WFT	11	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

"-" = monitoring was not conducted (i.e. no data available)
 * = no suspended sediment sampling
Bold indicates when the TTS station was in a different location

As a result of the 2014 land transaction to the County of Humboldt in Ryan Creek, implementation of the pilot project for the riparian modification experiment, and the suspension of stations associated with the outmigrant trapping and single stream juvenile salmonid population estimate studies, five TTS stations were suspended following WY 2014. The five suspended stations included one in the Little River Hydrological Planning Area (HPA, Railroad Creek), one in the Humboldt Bay HPA (Ryan Creek), one in Redwood Creek HPA (Panther Creek), and two in the Coastal Klamath HPA (North Fork Ah Pah and Tarup creeks). Railroad Creek was discontinued because of suspending outmigrant trapping and single stream estimate surveys at this station. Ryan Creek was discontinued because GDRCo no longer owns the majority of this watershed as a result of a county land transaction and a discontinuation of the outmigrant trapping effort. Monitoring was discontinued at Panther Creek because there were no fisheries monitoring efforts under the effectiveness monitoring program in this watershed. Similarly, North Fork Ah Pah Creek was discontinued after 2008 because we could not effectively monitor juvenile salmonid populations in this watershed. Tarup Creek has been discontinued because it was originally established as part of the riparian modification experiment, but this watershed was determined to be unsuitable for the study objectives. The two newest stations were established in the Coastal Klamath HPA (East Fork and West Fork Tectah creeks) in WY 2015. These stations were created because the upper Tectah watershed became an experimental watershed replacing Ryan Creek. Monitoring activities are currently ongoing as part of the riparian canopy modification experiment. Eight of the stations monitored during WY 2024 were located within an experimental watershed. Overall, 11 active stations were monitored during the 2024 WY encompassing five HPAs. The Little River HPA is a hydrologic unit as it contains an entire drainage (Table 37**Error! Reference source not found.**).

Table 37. Summary of the Hydrographic Planning Areas (HPAs) and watershed attributes of the current TTS stations.

Hydrographic Planning Areas (HPAs)	Station Code	Stream name	Watershed area above site - acres (km^2)	Total Watershed Area - acres (km^2)	Average Basin Slope (%)	Basin Relief - feet (m)
Humboldt Bay[1]	MC2	McCloud Creek	1486 (6.01)	1501 (6.08)	30.0	1565 (477)
Little River[2]	CC[3]	Carson Creek	2346 (9.49)	2347 (9.50)	24.2	1368 (417)
	LSF[3]	Lower South Fork Little River	3408 (13.79)	3409 (13.79)	41.0	1755 (535)
	USF[3]	Upper South Fork Little river	3673 (14.87)	3682 (14.90)	31.5	1865 (568)
Coastal Lagoons[1]	MSM	Mainstem Maple Creek	16500 (66.77)	16702 (67.59)	33.5	2325 (709)
	NFM	North Fork Maple Creek	6144 (24.86)	6623 (26.80)	26.2	2159 (658)
Coastal Klamath[1]	EFT[3]	East Fork Tectah Creek	1887 (7.64)	1888 (7.64)	31.4	1502 (458)
	WFT[3]	West Fork Tectah Creek	2045 (8.28)	2060 (8.34)	33.1	1496 (456)
	MSAP[3]	Mainstem Ah Pah Creek	3144 (12.72)	3155 (12.77)	41.2	1851 (564)
	SFAP2[3]	South Fork Ah Pah Creek	1518 (6.14)	1532 (6.20)	44.7	1860 (567)
Smith River[1]	SFW[3]	South Fork Winchuck River	5995 (24.26)	6143 (24.86)	32.2	1800 (549)

[1] Hydrographic area: HPA that encompasses multiple watersheds or a fraction of one

[2] Hydrologic unit: HPA that encompasses the entire drainage

[3] Located within an experimental watershed

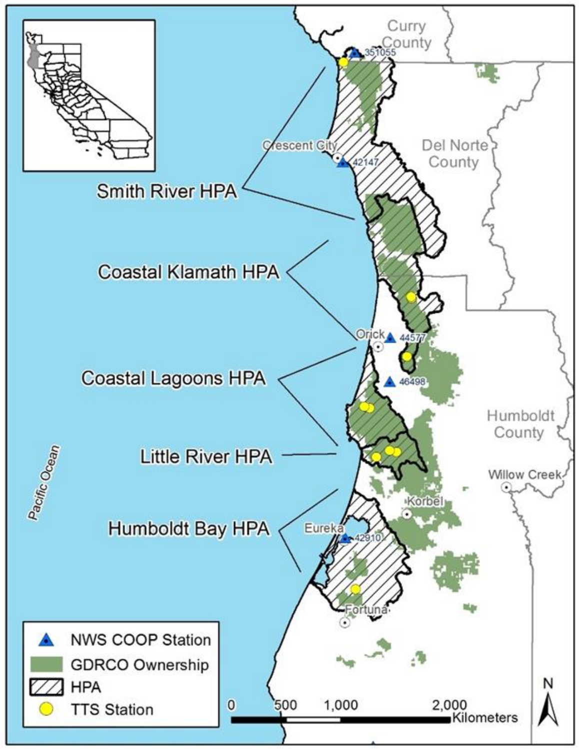


Figure 20. Map of GDRCO ownership, Hydrological Planning areas and locations of the current TTS monitoring sites in Humboldt and Del Norte Counties, California.

Methods

Field Activities

The specifications for the construction and operation of the TTS stations were based on procedures developed by the United States Forest Service Redwood Science Laboratory (Lewis and Eads, 2009). Automated TTS stations logged stage height and turbidity at 10-minute intervals for the WY from October 1 to July 1 and determined when a water sample should be taken. A DTS-12 turbidity sensor (Forest Technology Systems, LTD.) measured turbidity in Formazin Nephelometric Units (FNU) and a CS420-L (model PDRC 1830) Druck pressure transducer (General Electric) measured stage height in feet. Corresponding water samples were triggered based on established turbidity thresholds in the data logger program and collected with an ISCO 3700C water sampler (Teledyne ISCO). The datalogger program initiated water samples to be taken based on optimal sampling rates during rising and falling hydrographs and according to recorded turbidity values (Lewis and Eads, 2001). The datalogger program also ensured collection of samples every 40 minutes when the calibration range of the DTS-12 turbidimeter (1600 FNU) was exceeded so that storm peaks could be reconstructed. During field visits, the DTS-2 turbidity sensor was assessed to ensure it was at 6/10 depth for current or anticipated conditions, and the optic sensor was inspected to ensure it was free of debris or biofouling. Additionally, electronic stage readings were verified during each field visit with a physical stage plate to the nearest 0.01 ft for accuracy when possible.

Station visits occurred weekly or bi-weekly, during which the data from the logger (CR800 or CR1000, Campbell Scientific) was downloaded to a tablet using the LoggerLink application (Campbell Scientific), field data was recorded using the Fulcrum mobile data collection application, water samples were collected and transported to the lab, and discharge was measured when hydrologic conditions allowed. Discharge was measured in cubic feet per second (CFS) with a Price AA or pygmy current meter (Rickly Hydrological Company) to verify established stage-discharge rating curves and was calculated using the United States Geological Survey's (USGS) midsection method. Discharge measurements were assigned a qualitative grade (good, fair, poor, or unusable) based on field conditions and potential problems identified that might have affected its reliability. Observations of the monitoring unit's hydrologic controls were also made and included control type (section, channel, or combined section and channel) and control condition (clear, magnitude of debris or vegetation, and fill or scour control).

Data Management and Quality Assessment

Data files were downloaded from the station's dataloggers and brought back to the office, where station visit observations and water sample data were transferred to a GDRCo server and compiled into a proprietary SQL database. Stage and turbidity time-series data were imported to Aquatic Informatics' AQUARIUS Time-Series software (2024). Editing, data QA/QC, and analysis were performed using the proprietary database, AQUARIUS Time-Series, and Microsoft Excel. Discharge verticals were scrutinized to make sure that 10 percent or less of the total discharge passed through each segment (Turnipseed, D.P. and Sauer, V.B., 2010). Continuous stage and turbidity data were reviewed and graded based on quality and hydrologic conditions. If no edits were needed, the data were given a "very good" grade. If the data required editing, it was assigned a grade between "estimated very good," "estimated good," "estimated fair," "estimated poor," "partial," or "unusable," depending on the required edit to rectify the data and whether there was supporting surrogate data available. Continuous turbidity data that exceeded the calibration range (1600 FNU) of the DTS-12 turbidimeter were estimated using surrogate lab turbidity data to reconstruct the turbidity time-series data above this range. Further, a visual assessment comparing continuous stage and turbidity data was made to determine if there were any increases in continuous turbidity that were not associated with an increase in continuous stage. The presence of this pattern may have indicated sediment discharge from an upstream tributary or non-discharge-driven sediment input, such as a landslide or bank erosion.

Laboratory Processing

Laboratory processing methods were developed and modified based on the Implementation Guide for Turbidity Threshold Sampling: Principles, procedures, and Analysis (Lewis and Eads, 2009). Water samples were brought back to the lab, preserved with 3-7 drops of a 2 mol HCl solution, and analyzed to quantify turbidity and SSC.

Lab turbidity (Nephelometric Turbidity-Ratio Units, NTRU) was measured using a benchtop Hach TL2300 turbidimeter (Hach Company, Loveland, Colorado). Each sample was inverted three times to agitate, poured into a clear vial, which was also then inverted three times, and the highest NTRU value was recorded. This process was then repeated two more times. The final turbidity value was the average of the three readings. For water samples that exceeded the calibration range of the turbidimeter (4000 NTU), the sample was diluted 1:2. The diluted sample was processed as described above, each of the three readings was multiplied by the dilution factor, and then the three readings were averaged to provide a crude estimate of lab turbidity. The entire water sample was re-processed if any one of the three readings was greater than 10% of the average.

The samples were then processed for SSC as described in Method D 3977-97 “Standard Test Methods for Determining Sediment Concentration in Water Samples” (ASTM, 2014). As per a modified version of Method D 3977-97, grade B borosilicate glass microfiber filters (Sterlitech Corporation) with a 1.0 micron pore size received one pre-rinse with distilled water followed by vacuum filtration. They were then oven-dried between 103-105 degrees Celsius for a half hour, cooled in a desiccant cabinet, and weighed to the nearest 0.0001 g. Samples were then agitated and measured for volume to the nearest 5 ml, poured onto the pre-washed filters with vacuum filtration, dried at 103-105 degrees Celsius for 4 hours, cooled in a desiccant cabinet, and weighed to the nearest 0.0001 g. The filter containing sediment, minus the weight of the pre-rinse filter, divided by volume, equated to the SSC in mg/L.

Stage-Discharge Rating Curve Development

Continuous discharge for each station was derived by establishing a relationship between coinciding stage observations and discharge measurements, known as a stage-discharge rating curve. Developing a stage-discharge rating curve in open channels requires capturing the full range of flows through discharge measurements, with enough measurements to achieve high accuracy. The number of measurements needed depends on several factors, including the technician's experience, the stability of the cross section (hydrologic control), and the rate of flow change (Lewis and Eads, 2009).

Stage-discharge rating curves were developed and maintained using the AQUARIUS Time-Series Rating Development Toolbox (RDT, Aquatic Informatics, 2024) and best-practice techniques outlined by the USGS (Kennedy, 1984). Generally, high-quality discharge measurements were used to establish or verify the base rating, provided that the control was ‘clear’ and the grade was neither ‘poor’ nor ‘unusable.’ The base rating period was defined as the time for which the stage-discharge relationship remained valid. This period typically spanned at least one water year, often longer, and could sometimes be a clone of a previous period’s base relationship with slight adjustments.

When a large streamflow event resulted in changes to the hydrologic controls of a monitoring unit, a new rating period needed to be established within the same water year. A rating period could also include discharge measurements from outside that period, typically the largest discharge measurements recorded, to help estimate the upper end of the rating. These were generally reliable as channel morphology at these large recorded stages remained stable over long time scales unless catastrophic events caused geologic changes to the channel control. A general rule of thumb is to avoid estimating discharges greater than two times the maximum measured discharge as it becomes increasingly difficult to account for changes in channel or floodplain controls. Stage-discharge ratings at these upper extents may be updated and improved retroactively as more data becomes available.

Depending on the stability of the monitoring unit’s cross-section (section control), multiple shifts were applied to the base rating curve to reflect changes in control conditions. Shifts to the rating were applied during periods when high-quality discharge measurements deviated from the current rating by more than 10%, which could be explained by scour or fill conditions in the hydrograph. The stage at zero flow was either estimated based on data offsets or set based on observed stage height at zero flow, when available.

Sediment Load and Sediment Yield Derivations

The relationship between SSC and turbidity can change over the course of the annual monitoring period either between or within storm events (Lewis, 1996). When sample sizes allowed, individual storm events were analyzed to establish stronger relationships, including examining the rising and falling limbs of each storm. SSC data were paired with corresponding field turbidity measurements using procedures developed by Jack Lewis at Redwood Sciences Lab (Lewis, 2007), implemented within R, a free statistical software package (R Core Team, 2024). This software allows for the construction of turbidity sediment rating curves, allowing for the establishment of SSC-turbidity relationships on a storm-by-storm basis.

Storm periods were defined as those with at least four samples and covered the observed range of turbidity values on both the rising and falling limbs of the turbidity curve. Ideally, four samples from each limb (rising and falling) were used. In cases where the sample size for a storm period was fewer than four, adjacent storm samples were combined. Samples not associated with a storm period were categorized into ‘base’ periods, representing low-turbidity samples (typically less than 200 FNU), which could span an entire water year or seasonal periods. Given the extended duration of base periods, they were divided into 1-2 month segments to ensure the R program could process them efficiently. For example, multiple base periods could be defined within a single water year based on the 1-2 month segmentation, rather than hydrologic conditions like rising or falling limbs. For stations where individual storms or base periods did not cover the full range of turbidity values, and the sample size for the entire water year was fewer than 30, sediment load was estimated using all available samples for the water year.

The best-fit relationship for each period was determined based on graphical analysis, R-squared values, and residual standard errors, selecting from linear, power, square-root transformed, or log-transformed variables. When square root or log transformations were applied to predict SSC, the predictions were retransformed to the original units, which introduced bias (Miller, 1984; Koch and Smillie, 1986). To correct for this bias in log-transformed variables, the minimum-variance unbiased estimate (MVUE) was applied, and for square root transformations, a non-parametric "smearing" estimator was used (Duan, 1983).

Once relationships were established, the software produced a derived SSC time-series using the turbidity time-series as input. The derived SSC time-series was then multiplied by the derived continuous discharge data produced using the standard stage-discharge rating curve. This resulted in instantaneous Suspended Sediment Load (iSSL) estimates for every 10-minute interval during the water year. Each iSSL was then multiplied by 600 seconds (10 minutes) and summed to produce an annual suspended sediment load (SSL, kg). The annual SSL was converted to metric tons and standardized to the watershed area to produce an annual sediment yield in metric tons/km^2/year. For each period defined within the water year, the associated sediment load was estimated with a coefficient of variation (CV%) to indicate the standard error (the square root of variance, V) as a percentage of the estimated SSL.

Results

The highest observed flows occurred from late December to mid-March in WY 2023 and from early December to mid-January in WY 2024 across all sites. As expected, the highest field turbidity measurements generally coincided with peak flows, given that turbidity and suspended sediment are primarily discharge-driven.

In WY 2023, the highest recorded field turbidity was 1,168 FNU at West Fork Tectah Creek (WFT). In WY 2024, the highest recorded field turbidity was 5,151 FNU at McCloud Creek (MC2).

A total of 274 and 379 discharge measurements were collected in WYs 2023 and 2024, respectively. Annual peak streamflow ranged from 121 to 2184 CFS in WY 2023. In WY 2024, the peak annual streamflow ranged from 336 to 4379 CFS (Figure 21). Annual peak streamflow was greater across all sites in WY 2024 compared to WY 2023.

The number of water samples collected—both automated and manual—was 1,303 in WY 2023 and 1,906 in WY 2024. Of these, 852 and 1,125 samples were analyzed for lab turbidity, while 985 and 1,540 were processed for suspended sediment concentration (SSC) in WYs 2023 and 2024, respectively.

Estimated sediment yields ranged from 13.8 to 193.4 metric tons/km²/year in WY 2023 and from 98.1 to 584.3 metric tons/km²/year in WY 2024 (Figure 22). Sediment yield was greater across all sites in WY 2024 compared to WY 2023.

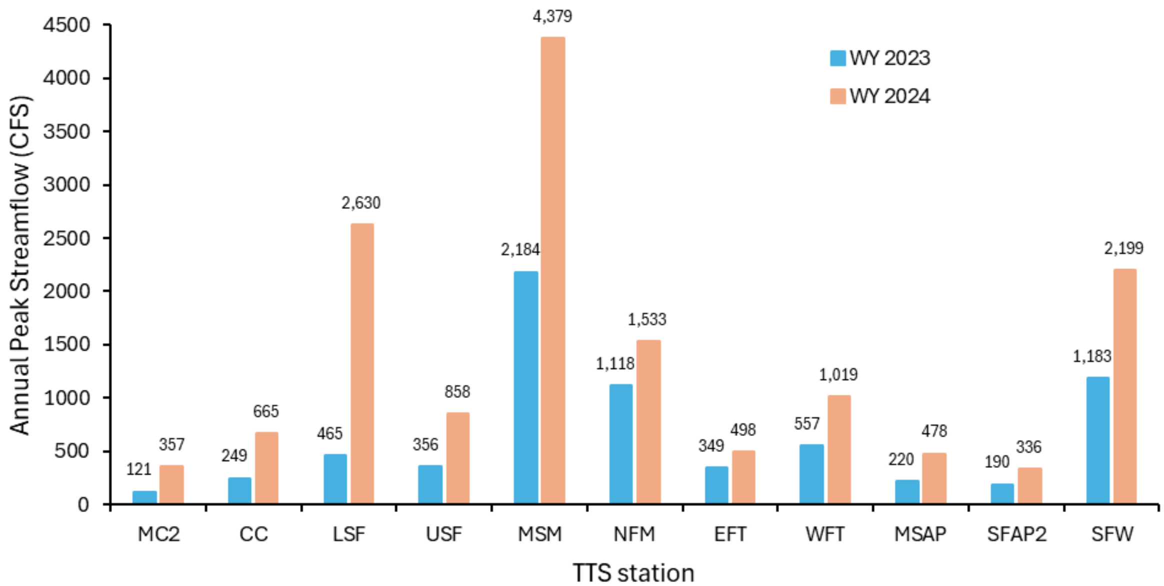


Figure 21. Annual peak streamflow (cubic feet per second, CFS) for 11 TTS stations for the 2023 and 2024 water years (WY).

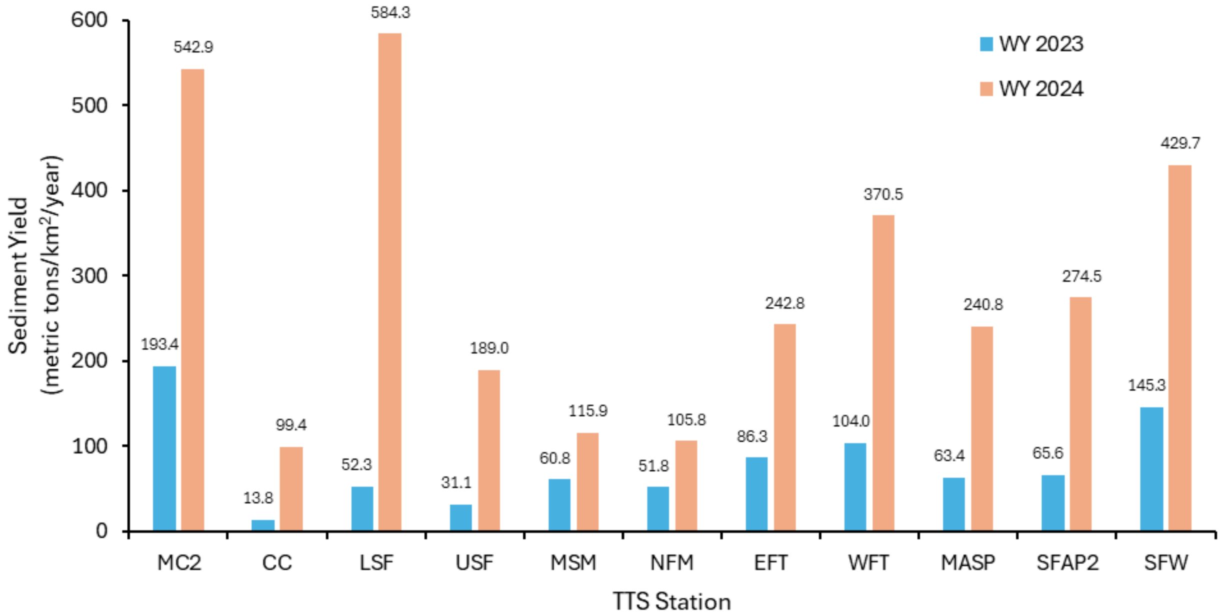


Figure 22. Annual sediment yield (metric tons/km^2/year) for 11 TTS stations for the 2023 and 2024 water years (WY).

Discussion

Water years 2023 and 2024 brought average to above-average rainfall across the North Coast of California (PRISM climate data). Rainfall patterns typically originate in the north, leading to greater variability and lower totals in the southern sites within our monitoring region. During these years, the northernmost monitoring sites received nearly twice the annual rainfall of the southernmost sites.

A key driver of the above-average rainfall observed in WY 2024 was a significant storm event on January 12–13, 2024, which resulted in record annual peak streamflow across all monitoring stations. The return interval for this event ranged from 10 to 20 years for major rivers in the region, including the Little River, Redwood Creek, Klamath River, and Smith River. This high-flow event contributed substantially to sediment transport, accounting for 47% to 85% of the total annual sediment yield at all TTS stations. Notably, the January 13th storm not only produced the largest peak flow of WY 2024 but also exceeded the median annual peak flow recorded at each site throughout their monitoring history. As a result, this single discharge event played a dominant role in the elevated sediment yields observed in WY 2024.

While high-discharge events play a key role in sediment transport within a given water year, long-term monitoring is essential for identifying trends in suspended sediment concentration and load. This approach is essential for understanding the cumulative impacts of land-use activities over time. Although the project does not include specific thresholds for meeting water quality standards, it allows for the assessment of changes in sediment metrics and the effectiveness of management strategies. As more data are collected, trend analyses can be conducted in relation to other monitoring projects outlined in the AHCP. While sediment yields provide useful comparisons across sites within a given water year, temporal patterns offer more comprehensive insights into how land-use practices influence suspended sediment within sites across multiple years. Monitoring these trends will help evaluate the long-term changes in suspended sediment since the AHCP's implementation in 2007 and assess its effectiveness. This includes the analysis of flow-normalized suspended sediment metrics, as suspended sediment is primarily discharge-driven and streamflow accounts for the greatest variability in sediment transport. Normalizing suspended sediment metrics by streamflow allows for a more accurate assessment of long-term trends related to land management and helps to contextualize sediment metrics with other explanatory variables, such as baseline geologic conditions, road metrics, and harvest-related activities.

Other updates

Aquarius Time-Series software (Aquatic Informatics Inc.) was acquired for the TTS monitoring program in 2016. The software offers several key advantages, including the integration of both field and lab data into a single database, continuous data plotting, the ability to analyze multiple water years, advanced data correction tools, and user-friendly rating development features. All historical field and lab data have been incorporated into the database, and quality assurance/quality control procedures have been completed.
In May 2019, a software upgrade (v. 2019.1) resulted in the loss of rating development functionality. During this period, GDRCo's aquatic program staff relied on R code developed by Jack Lewis to derive continuous suspended sediment concentration (SSC) for previous water years. While the Jack Lewis method offered a more robust analysis with confidence statistics, its use was limited to those proficient in R programming.

The issue persisted until August 2024, when the upgrade to version 2024.2 restored sediment workflow capabilities. As a result, GDRCo staff successfully implemented the suspended sediment load calculation workflow for the 2024 water year.

D. Experimental Watersheds

While the majority of the AHCP's monitoring projects will be conducted throughout the Plan Area, experimental watersheds judged to be representative of the different geologic and physiographic provinces across the Plan Area have been specifically designated where additional monitoring and research on the interactions between forestry management and riparian and aquatic ecosystems will be conducted. Those watersheds are the Little River (Little River HPA), South Fork Winchuck River (Smith

River HPA), and Upper Tectah Creek, Little Surpur Creek, and Ah Pah Creek (Coastal Klamath HPA).

As stipulated in AHCP Section 6.2.5.4, the program will entail:

- Effectiveness monitoring projects and programs that due to their complexity and expense of implementation can only be applied in limited regions (these include turbidity monitoring, Class III sediment monitoring, and road-related mass wasting monitoring;

- Studies related to harvested and non-harvested areas, allowing for more effective evaluation of conservation measures and increased understanding of the effects of forest management on the habitats and populations of the Covered Species.

- Studies of conservation and management measures, allowing for a refinement of measures and an assessment of the relative benefits of different measures under the AHCP; and

- Development and implementation of new or refined monitoring and research protocols.

Below is a summary of the studies or pilot studies, past and present, which have been carried out in an Experimental Watershed.

<u>SF Winchuck River Watershed</u>
- Property Wide Water Temperature Monitoring
- Class II BACI Water Temperature Monitoring
- Class I Channel Monitoring
- Long Term Habitat Assessment Monitoring
- LWD Monitoring
- Summer Juvenile Salmonid Population Estimates
- Turbidity Threshold Sampling (TTS) monitoring

<u>Ah Pah Creek Watershed</u>
- Property Wide Water Temperature Monitoring
- Class I Channel Monitoring
- Long Term Habitat Assessment Monitoring
- LWD Monitoring
- Summer Juvenile Salmonid Population Estimates
- Turbidity Threshold Sampling (TTS) monitoring
- Riparian Canopy Modification Experiment

<u>Upper Tectah Creek Watershed (watershed added per Minor Modification; GDRCo 2017)</u>
- Property Wide Water Temperature Monitoring
- Turbidity Threshold Sampling (TTS) monitoring

- Riparian Canopy Modification Experiment

Little Surpur Creek Watershed (watershed added per Minor Modification; GDRCo 2017)

- Property Wide Water Temperature Monitoring
- Long Term Habitat Assessment Monitoring
- LWD Monitoring
- Summer Juvenile Salmonid Population Estimates

Little River Watershed

- Property Wide Water Temperature Monitoring
- Class II BACI Water Temperature Monitoring
- Tailed Frog Life History Monitoring
- Class I Channel Monitoring
- Class III Channel Monitoring
- Long Term Habitat Assessment Monitoring
- LWD Monitoring
- Summer Juvenile Salmonid Population Estimates
- Outmigrant Trapping
- Turbidity Threshold Sampling (TTS) monitoring
- BACI Class II RH Cross Section Monitoring

Ryan Creek Watershed (watershed removed per Minor Modification; GDRCo 2017)

- Property Wide Water Temperature Monitoring
- Class III Channel Monitoring
- Outmigrant Trapping *
- Long Term Habitat Assessment Monitoring
- LWD Monitoring
- Turbidity Threshold Sampling (TTS) monitoring *

The development and implementation of new research and monitoring protocols will provide an opportunity for GDRCo to refine existing conservation measure to make them more effective and efficient. This will include state-of-the-art existing study designs along with original research approaches that will require the input from academic, agency, and private scientists.

1. Riparian Canopy Modification Experiment

GDRCo has been in the process of developing a watershed level experiment since shortly after the approval of our AHCP in 2007 in conjunction with numerous collaborators including Humboldt State University, Oregon State University, USGS, U.S. Forest Service, California Department of Fish and Wildlife (CDFW), CALFIRE and others. The conceptual framework for the experiment is focused on the response of stream systems to modifications of the riparian canopy that would increase the amount of solar radiation reaching the stream. The fundamental premise is that increases in sunlight will increase primary productivity in the stream ecosystem. A field experiment was designed and implemented to test effects of modifications to the riparian canopy on primary productivity as measured by fish and amphibian abundance and growth while at the same time minimizing negative impacts to aquatic life or water quality.

The potential that riparian canopy modifications may increase stream productivity is based on prior studies suggesting that light limitation of primary production often overrides nutrient limitation in small, forested streams (e.g., Lowe et al. 1986; Rand et al. 1992; Hill et al. 2001). This may be particularly common in the Pacific Northwest, where both coniferous vegetation and an increasing dominance of alder (Alnus spp.; Hu et al. 2001) can provide heavy riparian shade. In coastal settings in northern California, summer fog also reduces light reaching streams. Where light limits algal production, the ability of stream systems to respond to nutrient enrichment such as adding salmon carcasses may be affected and transfer pathways to salmonids may be restricted. Autotrophic pathways are particularly important in sustaining salmonid growth during spring and summer (Bilby and Bisson 1992) and are at the basis of the finding that logged streams often support higher salmonid production than their forested counterparts (e.g., Murphy and Hall 1981; Wilzbach et al. 1986).

The potential benefit of additional sunlight to resident salmonids has already been demonstrated by Wilzbach et al. (2005) in north coastal California. They conducted an experiment in which 100-m stream reaches were treated with complete removal of deciduous canopy to increase solar radiation. Half of these reaches were also treated with additions of salmon carcasses to increase nutrient levels. There was no measurable effect from the carcass additions on the initial and a follow-up study (Harvey and Wilzbach 2010), but removal of the riparian canopy had a strong positive impact on salmonid biomass, density, and growth. However, the implications from this study are limited to the stream reach scale, and what is lacking is additional experimentation to determine if similar results can be achieved at the stream or watershed scale.

The potential benefits of increased sunlight on a stream are not limited to fish species. Increases in primary productivity that indirectly benefits salmonid species through increases in the aquatic invertebrate fauna should also indirectly benefit many stream associated headwater amphibians. In addition, tailed frogs can be directly impacted since the larvae are benthic grazers that feed on unicellular algal periphyton. In two small coastal streams in British Columbia, Mallory and Richardson (2005) documented an increase in larval tailed frog growth with experimental increases in light, but no affect from nutrient additions.

Active management of second-growth stands to accelerate the acquisition of mid to late-seral characteristics using silvicultural treatments has also recently emerged as a top priority in forest parks and reserves in northern coastal California (Porter et al. 2007; Keyes et al. 2010; O’Hara et al. 2010). For example, Redwood National Park recently completed an Environmental Assessment and Finding of No Significant

Impact to thin 1,125 acres in the Middle Fork Little Lost Man Creek watershed (RNP 2014a and RNP 2014b). In contrast, little attention has been given to achieving similar management goals on private managed timberlands. Compared to late-seral stand condition, second-growth riparian stands typically have a much higher stem density with a shift to a greater proportion of red alder *(Alnus rubra*) and Douglas-fir (*Pseudotsuga menziesii*) and fewer redwoods (*Sequoia sempervirens*) (Keyes and Teraoka 2014). In addition to potentially increasing productivity in the aquatic environment, there are similar opportunities to restore and enhance tree species composition and size in the near stream riparian environment.

Although there is increasing evidence supporting the need for watershed level experiments, the complexity of initiating a long term study of this spatial extent with the potential for negative impacts raises many legitimate concerns that need to be overcome with small incremental steps. As a result, we initiated a pilot study (see Section VIII.D.2 below) with the fundamental goal of determining the feasibility of expanding the study to a larger scale watershed level experiment. Following the successful implementation of the pilot study, we initiated a watershed scale study in upper Tectah Creek to look at how changes in riparian canopy affects stream shading, light, water temperature, trophic pathways, and the growth and bioenergetic responses of cutthroat trout (see Section VIII.D.3 below for more details). Coupled with this project was a study conducted by CDFW designed to look at how different levels in riparian thinning affect the long-term development of different size classes of trees, snags and dead wood (see Section VIII.D.4 below for more details). More recently, GDRCo hosted another larger scale watershed level experiment that was funded by the Effectiveness Monitoring Committee (EMC) of the California Board of Forestry and Fire Protection (Board), to assess the effectiveness of the Board's recently enacted Forest Practice Rules (FPR) for Class II-L watercourses. In addition to evaluating the FPR Class II-L prescription this study was also designed to evaluate the AHCP Class II-2 prescriptions which are similar to the Class II-2 watercourses in their biological and geological attributes (see Section VIII.D.5 below for more details).

2. Pilot Project: SF Ah Pah Creek

<u>Objectives</u>

A pilot study was initiated on a single stream reach with several objectives. We evaluated the feasibility of marking and removing riparian trees as part of a timber harvest operation to achieve an approximate 50% overstory canopy cover post-harvest. We also monitored the treated reach to determine if there was any evidence of bank erosion or measured increases in turbidity/suspended sediments or any biologically significant increases in water temperature in the treatment or downstream reaches relative to the water entering the upstream portion of the treatment reach. Although the primary objectives were related to the physical variables, prior to conducting the treatment (i.e., felling of riparian canopy trees), we also captured and marked juvenile cutthroat and steelhead trout and coastal giant salamanders to test field methodologies and to provide an opportunity to record movements and growth. The data collected on the physical variables with potential for negative impacts were evaluated from this pilot treatment to ensure that treatment of additional stream reaches associated with watershed level experiments was warranted and unlikely to produce negative biological impacts.

Project Status

The pilot study was located on GDRCo's ownership in the South Fork (SF) Ah Pah Creek sub-basin that drains into the Lower Klamath River Basin. The single riparian treatment was conducted on an approved Timber Harvesting Plan (GDRCo # 56-1302; CalFire # 1-13-106HUM, Unit B) in SF Ah Pah Creek (Figure 23). The riparian management zone (RMZ) along the west side of the mainstem SF Ah Pah Creek in Unit B was marked by a forester to achieve approximately 50% overstory canopy after the trees were felled and yarded out of the RMZ. Trees marked for harvest

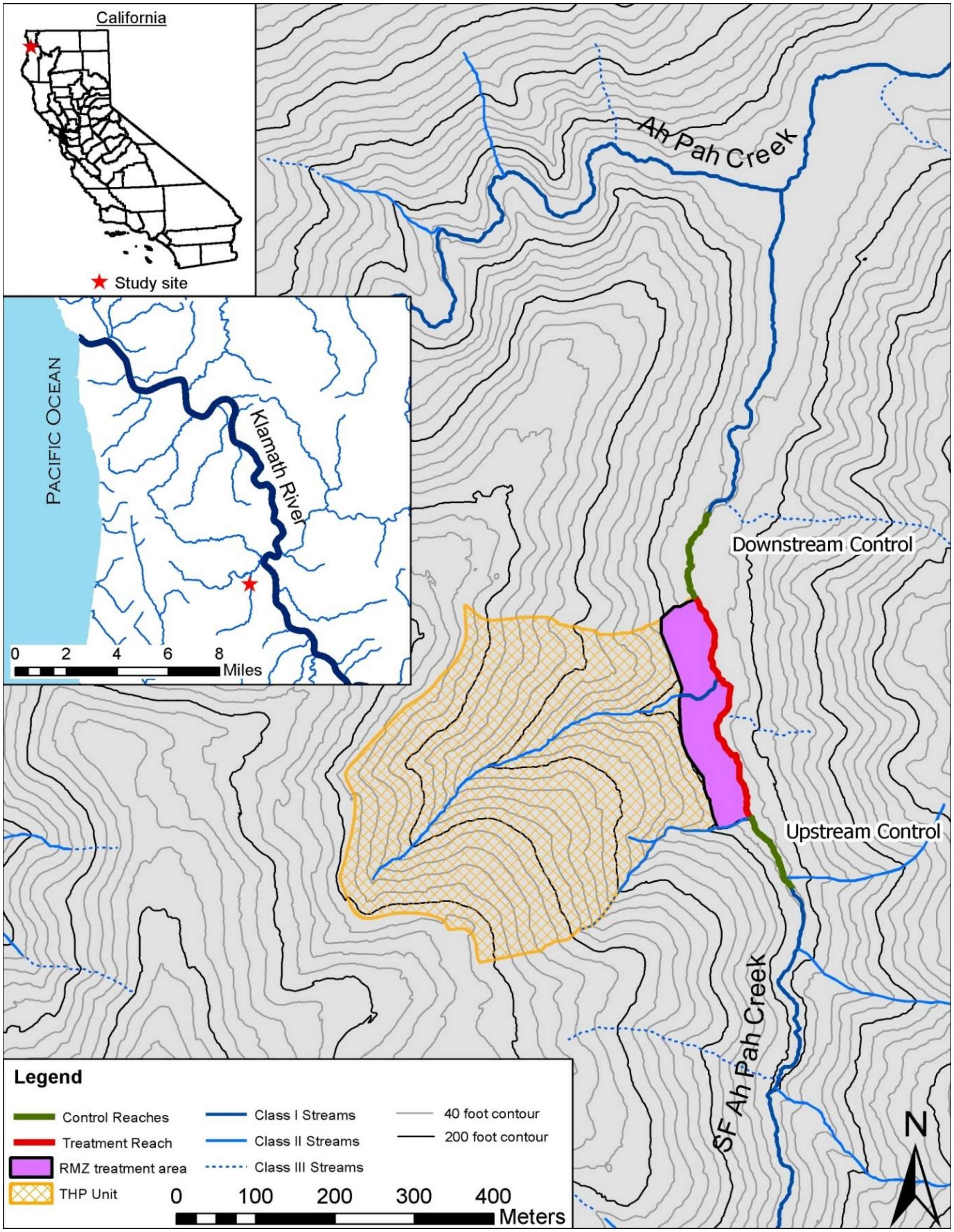


Figure 23. Overview map of treatment area and study reaches associated with the Pilot Project in SF Ah Pah Creek.

included alder, maple, bay, tanoak, hazelnut, and cascara. The marked trees with commercial value were yarded out of the RMZ, wherever feasible. Felling of the harvest unit was completed on March 31, 2015 and yarding was completed by April 3, 2016.

The stream reach immediately upstream of the treated RMZ served as a control for all the physical variables recorded in and immediately downstream of the treated reach. A 100-m reach immediately above and below the treated reach served as biological control areas for recording movement and growth response of marked juvenile cutthroat and steelhead trout and coastal giant salamanders (Figure 23).

Habitat mapping and animal sampling occurred in August 2014 and February 2015 to assess pre-treatment fish growth rates during what was believed to be a low growth rate period (Late fall / Early winter) (Figure 24). Post-treatment data collection occurred bimonthly from May 2015 until February 2018 (Figure 24).

Hemispherical photographs were taken in September 2014 (during leaf-on conditions) and January 2015 (during leaf-off conditions) to assess pre-treatment canopy closure and solar radiation in the control and treatment reaches (Figure 24). Post-treatment, from fall of 2015 to spring of 2018, there were six rounds (3 leaf-on and 3 leaf-off) of hemispherical photographs taken. Photographs are processed and analyzed using Hemi-View 2.1 software (Dynamax Inc., 1999).

Two of GDRCo's summer water temperature sites, one upstream (Ah_Pah_SF_(Yurok)) and one downstream (Ah_Pah_SF_(rock_pit)) of the treatment reach, have been monitored for 13 years and 10 years, respectively. (Figure 24). In 2014, as part of a graduate student p roject from HSU (Wick 2016), 12 additional summer water temperature sites (Ah_Pah_SF_4 through Ah_Pah_SF_15) were deployed to get a finer detailed assessment of water temperature conditions prior to treatment within the project area (Figure 24). All 14 of these sites were also monitored from 2015 through 2018 to assess water temperature conditions post-treatment.

Water quality characteristics (stage, discharge, turbidity and suspended sediment concentration) have been monitored from water year 2008-2015 (October – September; WY) downstream of the treatment reach as part of GDRCo's annual monitoring. This same monitoring was also conducted in WY 2016 and 2017 to assess any differences post-treatment. The site was moved upstream approximately 340 feet due to changes in the channel configuration that compromised the quality of data collection at the previous site. Additionally, starting in WY 2017, "forensic turbidity sampling" was conducted following any three-inch cumulative rain event that occurred in a 24-hour period to determine if any

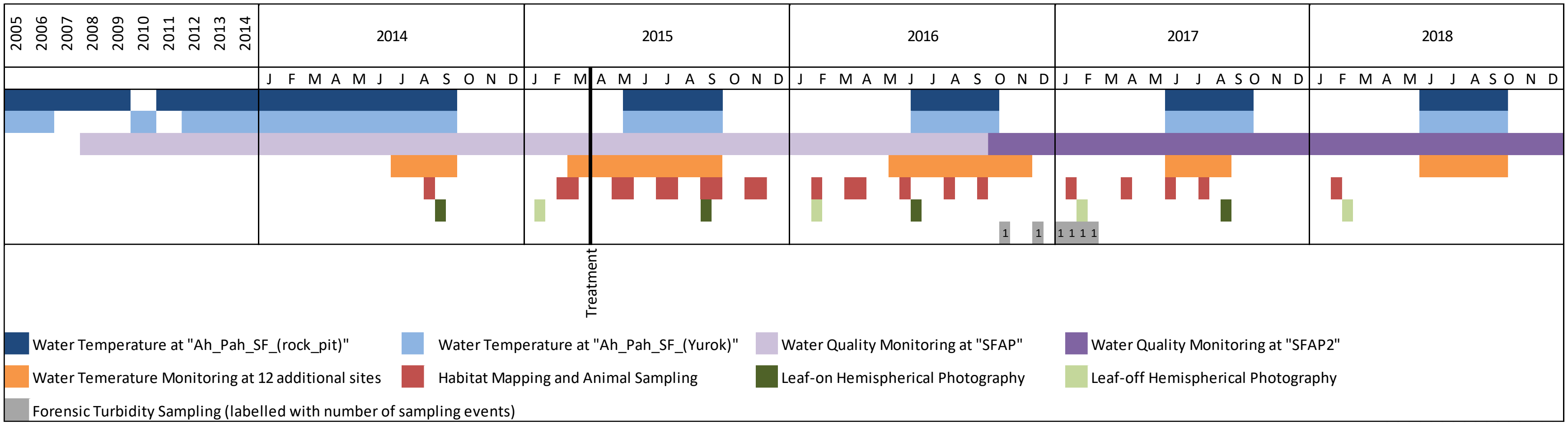


Figure 24. Chronological summary of key monitoring activities associated with the Pilot Project in SF Ah Pah Creek. From 1995 through 2014, the water temperature monitoring was generally conducted from April to October.

post-treatment effect could be detected at the site scale (Figure 24). For each forensic turbidity sampling, water samples were collected manually from 9 stations whenever the three-inch rainfall threshold was met.

Some preliminary results and observations from this pilot project were presented in the 6th Biennial Report (GDRCo 2019) and were reviewed with the Services. The Services were satisfied with these preliminary results to justify proceeding with the watershed level experiments in Class I watercourses (see the Tectah Creek Riparian Canopy Experiment in Section VIII.D.3.) and Class II watercourses (see the Effectiveness of Class II Riparian Prescriptions in Section VIII.D.4.). GDRCo is planning on presenting these data at the 40th Annual Salmonid Restoration Conference on April 28, 2023 in Fortuna California.

3. Tectah Creek Riparian Canopy Experiment

The Tectah Creek Riparian Canopy Experiment is a watershed level project located on GDRCo's ownership in Tectah Creek, tributary to the Lower Klamath River Basin. The riparian treatment areas were incorporated into a Timber Harvesting Plan (GDRCo # 56-1601; CalFire # 1-16-091HUM) in Upper Tectah Creek (Figure 25). The target overstory canopy retention level post-harvest within the treatment reaches was 50%. Based on information learned from the pilot project in SF Ah Pah Creek, canopy was removed along both sides of the stream in each treatment reach to ensure adequate solar radiation reached the stream to observe a treatment response. Trees marked for harvest included alder, maple, tanoak, madrone, Douglas-fir, redwood, and hemlock. The marked trees with commercial value were yarded out of the RMZs, wherever feasible. Stream reaches immediately upstream of the experimental RMZs served as the control for each harvest unit and the stream reach immediately downstream of the treated RMZs served as the downstream response for each harvest unit (Figure 15). Monitoring associated with this experiment was conducted in conjunction with a research project by David Roon (PhD candidate from Oregon State University), whose dissertation research also included studying the riparian thinning restoration that was conducted along Middle Fork Lost Man Creek in Redwood Nation Park.

<u>Objectives</u>

The objectives of the study are to 1) determine how changes in canopy cover and light associated with riparian thinning will affect thermal regimes within the stream network, 2) determine how stream food web structure shifts to changing riparian canopy conditions associated with the experimental thinning treatments, 3) determine if thermal or trophic pathways are responsible for driving potential changes in growth, production, and bioenergetics for cutthroat trout, and 4) evaluate cumulative watershed effects associated with riparian thinning for aquatic ecosystems using a food web system dynamics model. David Roon's research proposal was provided in Appendix D of the 5th Biennial Report (GDRCo 2017).

Project Status

Pre-treatment data collection for the project began in 2015 and 2016. Felling and yarding activities of the harvest units were completed during 2017. Post-harvest data collection began during late summer 2017 and was completed during the fall of 2018. Current activities are focused on data analysis and writing.

Dave Roon's dissertation on the Tectah Creek riparian experiment was submitted on June 24th, 2021. The dissertation included four chapters:

- Chapter 1: General Introduction

- Chapter 2: Shade, light and stream temperature responses to riparian thinning in second-growth redwood forests, Northern California.

  This chapter evaluates the reach-scale responses of riparian shade, light, and stream temperature to riparian thinning. Stream thermal responses were characterized seasonally and across multiple components of the thermal regime.

  This chapter was published in PLoS ONE: Roon et al. 2021 Shade, light, and stream temperature responses to riparian thinning in second-growth redwood forests of northern California.

- Chapter 3: A riverscape approach reveals downstream propagation of stream thermal responses to riparian thinning at multiple scales.

  This chapter evaluates the watershed-scale patterns in stream temperature in response to riparian thinning. It evaluates the temporal duration and spatial extent of local and downstream temperature responses to riparian thinning across multiple spatial and temporal scales.

  This chapter was published in Ecosphere: Roon et al. 2021 Ecosphere a riverscape approach reveals downstream propagation of stream thermal responses to riparian thinning

- Chapter 4: Effects of riparian thinning on trophic pathways supporting stream food webs in second growth redwood forests of Northern California.

  This chapter evaluates the effects of riparian thinning on the trophic pathways supporting stream food webs. It evaluates how increases in light associated with thinning influences stream food webs and combines data on stream periphyton, macroinvertebrates in the diets of coastal cutthroat trout and coastal giant salamander, and stable isotopes.

This chapter was published in Ecosphere: Roon et al. 2022 Influence of riparian thinning on trophic pathways supporting stream food webs in forested watersheds

- Chapter 5: Effects of riparian thinning on growth and energetics of coastal cutthroat trout in forested streams at reach and watershed scales.

  This chapter evaluates whether changes in temperature or prey resources associated with thinning influenced growth and bioenergetic responses by coastal cutthroat trout. This chapter will combine results from the previous chapters with growth data and bioenergetics modeling.

  Data analysis and writing for this chapter is ongoing. This chapter is expected to be submitted to a journal for peer-review during 2023.

David Roon has presented this research at a variety of scientific meetings and symposiums in 2021 and 2022:

- Stream food web responses to riparian thinning in second-growth redwood forests

- PNW chapter of the Society for Freshwater Sciences, virtual, 10/27/2021

- Society for Freshwater Sciences annual meeting, virtual, 05/26/2021

- Oregon chapter of the American Fisheries Society meeting, virtual 03/03/2021

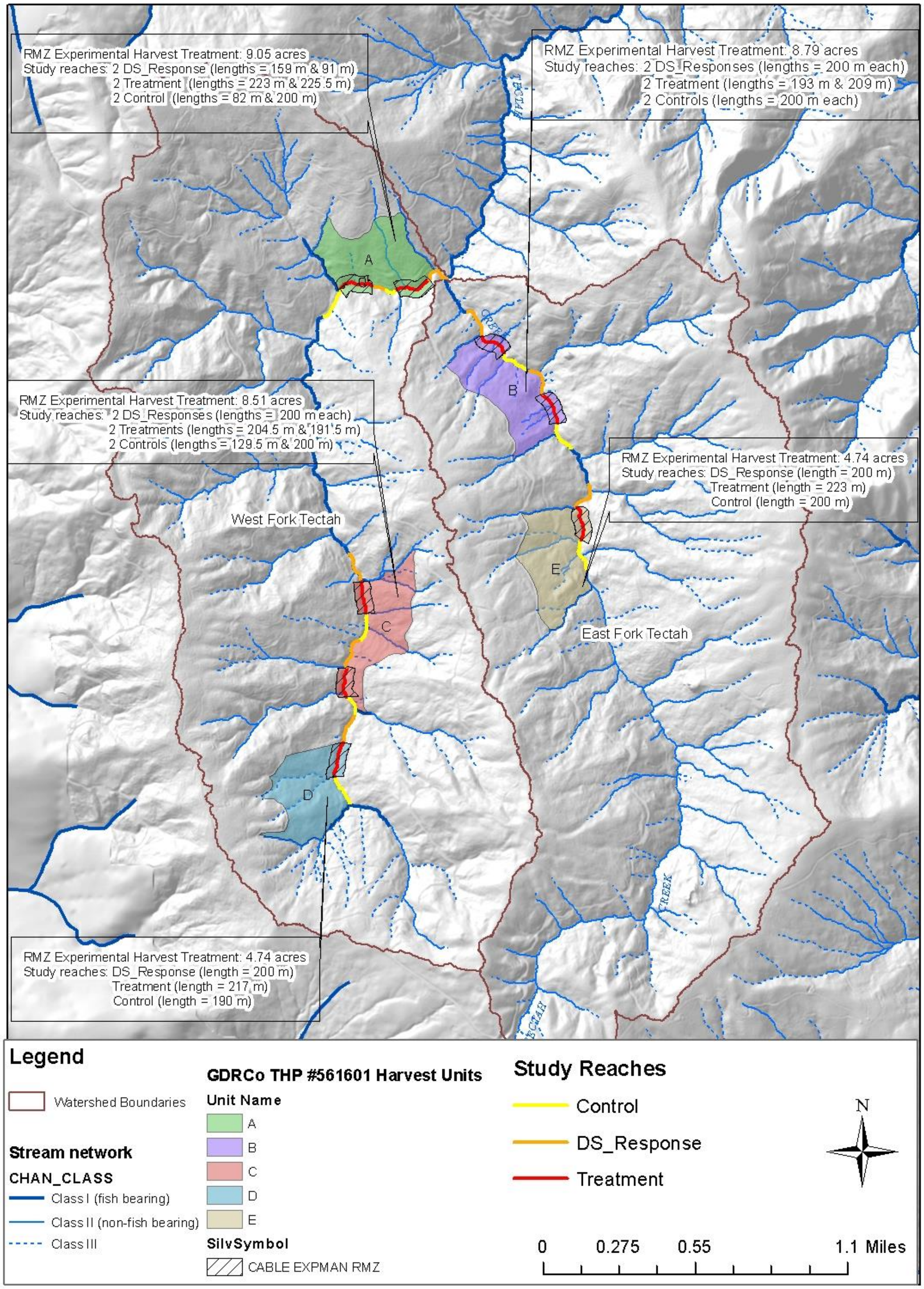


Figure 25. Map of experimental thinning treatments in Upper Tectah Creek.

4. Forest Growth Modeling of Tectah Creek Experimental Riparian Thinning Treatments

The original study design of the Tectah Creek Riparian Canopy Experiment did not include provisions to evaluate the effects of riparian thinning on the promotion of late seral habitat for terrestrial wildlife species. To fulfill this objective California Department of Fish and Wildlife proposed and initiated a project in conjunction with the Tectah Creek Riparian Canopy Experiment to evaluate how the riparian thinning treatments associated with this study might affect the long-term development of large-diameter live trees, snags, and dead wood. Stand plots (60 foot radial) were established randomly within one of each riparian thinning treatment for each harvest unit. The plots were surveyed during the late summer of 2016 (pre-harvest) and again post-harvest during the summer of 2017. The survey protocols used were based on US Forest Service (USFS) Forest Inventory and Analysis Program Manual (USDA 2016). The plot inventory data were analyzed using the USFS Forest Vegetation Simulator (FVS) (Keyser 2016) to simulate the forest stand development of the treatments for standing, snag and downed wood diameter distributions over a 200-year time period. There were a total of 8 plots modeled using FVS; four plots received standard AHCP Class I prescriptions which included 85% overstory canopy cover within the inner 50-70 foot zone and 70% canopy covers within the remaining outer zone (AHCP Sections 6.2.1.1 and 6.2.1.2) and four plots received the experimental thinning treatment of 50% overstory canopy cover.

Project Status

CDFW has completed a final report: Nicolas Simpson 2022, California Department of Fish and Wildlife submitted to California Natural Resources Agency. Using a Forest Growth Model to Evaluate Effects of an Experimental Riparian Thinning Treatment on Diameter Distribution, Stand Density, and Dead Wood, Along a Northern California Stream.

5. Effectiveness of Class II Riparian Prescriptions

Green Diamond agreed to host a study, which was conceived, initiated and principally funded by the Effectiveness Monitoring Committee (EMC) of the California Board of Forestry (Board), to assess the effectiveness of the Board's recently enacted California Forest Practice Rules for Class II-L watercourses (14 CCR § Section 916.9). In their biological and geological attributes, State Class II-L watercourses are similar to Class II-2 watercourses outlined in AHCP Section 6.2.1.3. The experiment is being conducted on GDRCo property within tributaries of the Lower Klamath River watershed.

The proposed study reaches and the proposed treatments were reviewed with the Services on August 27, 2019. A letter was submitted to the Services on September 3, 2019 requesting concurrence to conduct the project under AHCP Section 6.2.54 of the Experimental Watersheds Program. On October 24, 2019, the Services provided written concurrence for the study design related to the number and location of study sites, the experimental treatments allocated to each site, including untreated controls, and the grouping of study sites for replication. The majority (12 of 18) of the proposed study sites are located within the designated Experimental Watersheds established in AHCP Section 6.2.5.4. Due to difficulties in obtaining adequate sample sizes and replication, 6 of the 18 study sites were located outside of the Experimental Watersheds; however, the treatments associated with these 6 study sites provide protections that are greater than or equal to the protections of Class II-2 watercourses provided for in AHCP Section 6.2.1.3. The full study proposal for this experiment is included in Appendix E.

Objectives

The objectives of this experiment are to evaluate if the current Class II riparian requirements/regulations are effective at maintaining, protecting, and restoring (a) canopy closure, (b) stream water temperature, and (c) primary productivity. It is also to examine what stream and riparian forest characteristics are important for determining effectiveness of the RMZs. A Before-After Control-Impact (BACI) study design is being utilized. Multiple Class II-2 (Class II-L) stream reaches are instrumented to evaluate RMZ stand structure, canopy closure, upstream/downstream water temperature, and primary productivity response under varying riparian prescriptions.

Project Status

This project is operational ongoing. Preharvest data was collected during 2019-2020 and post-harvest data collection occurred during 2021-2022.

Oregon State University master's student Jonah Nicholas defended his thesis in December 2022: Riparian effects on headwater streams: Changing summer flow after harvests in coastal Northern California.

A final report was submitted to the EMC in October of 2023

Kevin and Catlina presented a final presentation to the EMC in June of 2024.

Matt Nannizzi presented the entire riparian experiment to the Board of Forestry in December of 2024 and the California Licensed Foresters Association in March of 2025.

A Completed Research Assessment will be submitted to the EMC in 2025.

E. Protocol Updates

As allowed under the AHCP Program Flexibility (AHCP Section 6.3.5.1.1), monitoring techniques and related technology are expected to change significantly through the life of this Plan. Some monitoring approaches may be retired or replaced by more efficient and/or accurate techniques to address the same issue, and entirely new approaches may be implemented to address currently unforeseen issues. Since implementation of the Plan, modifications to some of the effectiveness monitoring field protocols have occurred. To help track the field protocol changes that have occurred to date and in the future, a summary was compiled (Table 38) and will be updated biennially.

Table 38. Summary of effectiveness monitoring protocol updates (Y = yes, N = no; field protocol modified) since AHCP implementation.

Monitoring Project Type	Project Type	Years Field Protocol Updated																	
		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Rapid Response Monitoring	Headwaters Monitoring - Tailed Frog	N	N	N	N	N	N	Y[1]	N	Y[2]	N	N	N	N	N	N	N	N	N
	Headwaters Monitoring - Torrent Salamander	N	N	N	Y[3]	N	N	N	N	Y[2]	N	N	N	Y[4]	N	N	N	N	N
	Spawning Substrate Permeability	N	N	N	N	Y[5]	N	N	N	N	N	N	N	N	N	N	N	N	N
	Road-related Surface Erosion Turbidity Monitoring	N	N	N	N	Y[6]	N	N	N	N	N	N	N	N	N	N	N	N	N
Response Monitoring	Class I Channel Monitoring	N	N	N	N	N	N	N	N	Y[7]	N	N	N	N	N	N	N	N	N
	Class III Sediment Monitoring	N	N	N	N	Y[8]	N	N	Y[5]	N	N	N	N	N	N	N	N	N	N
Long-term Trend Monitoring/Research	Out-migrant Trapping	N	N	N	N	N	N	N	N	Y[9]	N	N	N	N	N	N	Y[12]	N	N
	10 Year Tailed Frog Occupancy Survey	N	N	N	N	N	N	N	N	N	N	N	N	Y[10]	N	N	N	N	N
	10 Year Torrent Salamander Occupancy Survey	N	N	N	N	N	N	N	N	N	N	N	N	Y[2]	N	N	N	N	N
	Road-related Mass Wasting Monitoring	N	N	N	N	Y[6]	N	N	N	N	N	N	N	N	N	N	N	N	N
	Road Treatment Implementation and Effectiveness Monitoring	N	N	N	N	N	N[11]	N	N	N	N	N	N	N	N	N	N	N	N

[1] = A pilot project using eDNA was implemented. [2] = Switched from abundance to occupancy survey. [3] = Switched from every other year to every year sampling frequency. [4] = Switched back to sampling sites every other year. [5] = Project retired until alternative is identified. [6] = Replaced with Road Treatment Implementation and Effectiveness Monitoring. [7] = Discontinued cross section and roughness coefficient surveys. [8] = New group of sites sampled. [9] = Discontinued sampling in Ryan Creek and Railroad Creek. Also, initiated sampling in mainstem Little River. [10] = Switched from abundance to occupancy survey and added eDNA sampling. [11] = Project started in 2010 as part of the MATO and Road Management WDR. Was used to replace Road-related Surface Erosion Turbidity Monitoring and Road-related Mass Wasting Monitoring projects starting in 2012. [12]=Discontinued outmigrant trapping in Carson Creek, Lower South Fork Little River and Upper South Fork Little River.

IX. Adaptive Management Account

The AHCP was designed to be adapted over time as GDRCo learns new information through triggering of a yellow or red light condition determined through on-going monitoring, slope stability monitoring, or through the outcome of a designed experiment in one or more of the Experimental Watersheds. As described in AHCP Section 6.2.6, adaptive management changes will be subject to the availability of the Adaptive Management Reserve Account (AMRA) and limited to changes in RMZs, SMZs and specific road management plan prescriptions. The opening balance of the AMRA was set to 1,550 Fully Stocked Acres. There were no debits or credits made to the AMRA balance during this reporting period. The balance of the AMRA, as of December 31, 2022, is 1,550 Fully Stocked Acres. Any debits and credits will be tracked on an on-going basis and the account will be summarized and updated in each biennial report.

X. Changed Circumstances

The AHCP Conservation Program was designed within the context of the forestland ecosystems in the Plan Area. These ecosystems are dynamic rather than static; they are regularly impacted by various natural physical processes that shape and reshape the habitat for the affected species that occupy those areas. The aquatic species for whose conservation the AHCP was crafted evolved in close association with this ever-changing mosaic of natural physical elements.

The natural physical processes that affect the biodiversity and landscape ecology are usually of moderate intensity and relatively confined in geographic extent and magnitude of impact. Nonetheless, natural physical processes have on occasion been of catastrophic intensity, particularly from the standpoint of impact to individual plants and animals. That these natural physical processes can significantly alter aquatic and riparian habitat has been a substantive consideration in the development of the AHCP, and this Plan was designed to minimize and mitigate management-related disturbances and create conditions that enable natural disturbances to create productive habitat.

GDRCo recognizes that the temporal and spatial configurations of future natural disturbances (and their specific related effects on the aquatic species covered under the Plan) are inherently unpredictable. The fact that certain types of natural disturbances will occur at some time during the term of the AHCP and at some location in the Plan Area is, however, reasonably foreseeable. The operating conservation program was designed, in large part, to be responsive to historical disturbance patterns. The prescriptions were intended to develop a landscape capable of delivering valuable functions in response to such natural disturbances. Therefore, the occurrence of most natural disturbances will not create conditions that should require the implementation of revised prescriptions.

Certain reasonably foreseeable disturbances, however, may be of such magnitude, occur with such frequency or impact particular portions of the Plan Area as to require the application of supplemental prescriptions for the protection of the Covered Species. These supplemental prescriptions are provided in AHCP Section 6.2.9.

There were five types of changes identified in the AHCP as potential “changed circumstances” as defined in applicable federal regulations and policies:

1. Fire covering more than 1,000 acres within the Plan Area or more than 500 acres within a single watershed within the Plan Area, but covering 10,000 acres or less;
2. Complete blow-down of more than 150 feet of previously standing timber within an RMZ, measured along the length of the stream; but less than 900 feet of trees within an RMZ, due to a windstorm;
3. Loss of 51% or more of the pre-harvest total tree basal area within any SSS, headwall swale, or Tier B Class III watercourses as a result of Sudden Oak Death (SOD) or stand treatment to control SOD;
4. Landslides that deliver more than 20,000 cubic yards and less than 100,000 cubic yards of sediment to a channel; and
5. Listing of a species that is not a Covered Species but is affected by the Covered Activities.

GDRCo did not discover nor was GDRCo made aware of any type of conditions that constitute Changed Circumstances as defined above during this reporting period.

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XII. Glossary

A. Abbreviations

ACC	Average Canopy Cover
AHCP	Aquatic Habitat Conservation Plan
AMRA	Adaptive Management Reserve Account
BACI	Before-After-Control-Impact
CalFire	California Department of Forestry and Fire Protection
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEG	Certified Engineering Geologist
CI	Confidence Interval
CMZ	Channel Migration Zone
DARR	Darroch Analysis with Rank Reduction
DEM	Digital Elevation Model
DBH	diameter at breast height
DOQQ	Digital Orthophoto Quarter Quads
DSC	Downstream Control
DSL	Deep-Seated Landslide
EC	Effective Shade
EEZ	Equipment Exclusion Zone
EMC	Effectiveness Monitoring Committee
ESA	Endangered Species Act
ESP	Enhancement of Survival Permit
FPRs	Forest Practice Rules
FRIS	Forest Resources Information System
FVS	Forest Vegetation Simulator
GDP	Gross Domestic Product
GDRCo	Green Diamond Resource Company
GHG	Green House Gases
GIS	Geographic Information System
HCP	Habitat Conservation Plan
HPA	Hydrographic Planning Area
HRA	Habitat Retention Area
HWS	Headwall Swale
IA	Implementation Agreement
IFM	Intensive Forest Management
ITP	Incidental Take Permit
LiDAR	Light Detection And Ranging
LSFLR	Lower South Fork Little River
LTO	Licensed Timber Operator
LWD	Large Woody Debris
MATO	Master Agreement for Timber Operations
MWA	Mass Wasting Assessment
MWPZ	Mass Wasting Prescription Zones

NAIP	National Agriculture Imagery Program
NCRWQCB	North Coast Regional Water Quality Control Board
NMFS	National Marine Fisheries Service
NSO	Northern Spotted Owl
PI	Prediction Interval
PIT	Passive Integrated Transponder
PG	Professional Geologist
RMA	Routine Maintenance Area
RMWDR	Road Management Waste Discharge Requirements
RMZ	Riparian Management Zone
RPF	Registered Professional Forester
RRC	Railroad Creek
RSMZ	Riparian Slope Stability Management Zone
RST	Rotary Screw Trap
RWU	Road Work Unit
SMZ	Slope Stability Management Zone
SOD	Sudden Oak Death
SRL	Shallow Rapid Landslide
SSC	Suspended Sediment Concentration
SSS	Steep Streamside Slope
SSSMU	Steep Streamside Slope Morphologic Unit
THP	Timber Harvesting Plan
TMIS	Timberlands Management Information Systems
TRT	Treatment
TTS	Turbidity Threshold Sampling
USC	Upstream Control
USFLR	Upper South Fork Little River
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WEST Inc.	Western EcoSystems Technology Inc.
WDRs	Waste Discharge Requirements
WSFPB	State of Washington’s Forest Practice Board
YOY	Young of the year
7DMAVG	highest 7-day moving mean of water temperature
7DMMX	highest 7-day moving mean of the maximum daily temperature

B. Definitions

Adaptive Management: As defined by the Services for purposes of their HCP program, a method for examining alternative strategies for meeting measurable biological goals and objectives, and then, if necessary, adjusting future conservation management actions according to what is learned (65 Federal Register 106, 36245).

Aerial logging: Movement of logs to a landing by use of helicopters, or balloons, often used where roads cannot be constructed to provide access to a harvesting unit.

Age class: One of the intervals into which the age range of trees is divided for classification or use in management.

Aggradation: Deposition in one place of material eroded from another. Aggradation raises the elevation of streambeds, floodplains, and the bottoms of other water bodies.

Alternative Geologic Prescription: Any prescription applied to a mass wasting prescription zone that deviates from the default prescriptions defined in GDRCo's AHCP.

Alternative Prescription: Excerpt from the 2013 Forest Practice Act; "(a) An alternative prescription shall be included in a THP when, in the judgment of the RPF, an alternative regeneration method or intermediate treatment offers a more effective or more feasible way of achieving the objectives of Section 913 [933, 953] than any of the standard silvicultural methods provided in this Article."

Approved Plan: All AHCP THPs with an approval date that falls within the reporting period. These THPs are queried and provide data for the THP summary tables in the AHCP Biennial Report.

Bankfull channel width: Channel width between the tops of the most pronounced bank on either side of a stream reach where water would just begin to flow out onto the floodplain.

Basal area: The cross sectional area of a single stem, including the bark, measured at breast height (4.5 feet above the ground).

Before-After-Control-Impact (BACI): An experimental approach that utilizes a paired design with treatment and control sites. Data are collected from both experimental sites before and after the treatment and an analysis is done to determine if the relationship of the response variable(s) between the treatment and control sites differs following the treatment.

Biomass harvesting: A hazard abatement process that involves the removal of logging debris that typically is piled during active harvesting operations. The debris is removed from the harvesting area and is used as hog fuel rather than being burned on site.

Break-in-slope: See Qualifying Slope Break.

Broadcast burn: A prescribed fire allowed to burn throughout a site preparation area to prepare it for regeneration. It does not include burning of organic matter which is piled during mechanical site preparation or for hazard reduction."

Buffer: A vegetation strip or management zone of varying size, shape, and character maintained along a stream, lake, road, or different vegetation zone to minimize the impacts of actions on sensitive resources.

Cable yarding (logging): Taking logs from the stump area to a landing using an overhead system of winch-driven cables to which logs are attached with chokers.

California Forest Practice Rules (CFPRs): Rules promulgated by the California Board of Forestry and administered by the California Department of Forestry and Fire Protection governing the conduct of commercial timber operations on state and private land in California.

Candidate Conservation Agreement with Assurances (CCAA): An agreement between a non-federal property owner and the Service(s), in which the property owner commits to implement conservation measures for a proposed or candidate species or a species likely to become a candidate or proposed in the near future. The property owner also receives assurances from the Service(s) that additional conservation measures will not be required and additional land, water, or resource use restrictions will not be imposed should the currently unlisted species become listed in the future (64 Federal Register 116, 32727). The agreement accompanying with an enhancement of survival permit issued under section 10(a)(1)(A) of the ESA.

Changed Circumstances: Changes in circumstances affecting a species or geographic area covered by a conservation plan that can reasonably be anticipated by plan developers and the Services and that can be planned for (e.g. the listing of a new species, or a fire or other natural catastrophic event in areas prone to such events.). 50 CFR §§ 17.3, 222.102. Changes that will constitute Changed Circumstances, and the responses to those circumstances, are described in Plan Section 6.2. Changed Circumstances are not Unforeseen Circumstances.

Channel: Natural or artificial waterway of perceptible extent that periodically or continuously contains moving water.

Channel Migration Zones (CMZs): Current boundaries of bankfull channel along the portion of the floodplain that is likely to become part of the active channel in the next 50 years. The area of the channel defined by a boundary that generally corresponds to the modern floodplain, but may also include terraces that are subject to significant bank erosion.

Class I watercourses: All current or historical fish-bearing watercourses and/or domestic water supplies that are on site and/or within 100 feet downstream of the intake.

Class II watercourses: As used in the Plan, watercourses containing no fish, but support or provides habitat for aquatic vertebrates. Seeps and springs that support or provide habitat for aquatic vertebrates are also considered Class II watercourses with respect to the conservation measures.

Class II-1 watercourse: A subset of Class II watercourses, as illustrated in Figure 6-2 of the AHCP.

Class II-2 watercourse: A subset of Class II watercourses, as illustrated in Figure 6-2 of the AHCP.

Class III watercourses: Small seasonal channels which do not support aquatic species, but have the potential to transport sediment to Class I or II watercourses.

Clearcutting: Even-aged regeneration method where all the merchantable trees in the stand are removed in one harvest. Regeneration is accomplished by natural or artificial means.

Cobble: Substrate particles 64-256 mm in diameter. Often subclassified as small (64-128 mm) and large (128-256 mm).

Colluvial hollow: A low tract of land surrounded by steep slopes and continually filled with colluvial material, may be “U” or “V” shaped, is a source for debris flow initiation, typically found above or near the head of a watercourse and generally does not flow water annually.

Commercial harvest: Removal of merchantable trees from a stand.

Commercial thinning: Any type of thinning producing merchantable material at least equal to the value of the direct costs of harvesting and to achieve optimum diameter growth and increase the eventual product value of the remaining trees.

Completed THPs: Completed THPs for the biennial report include AHCP THPs where all units have been depleted (i.e. the felling, logging, loading, & hauling have been completed) for all the units in the timber harvest plan during the reporting period. Note: Only the last unit to be depleted needs to fall within the reporting period.

Covered Activities: Certain activities carried out by Green Diamond in the Plan Area that may result in incidental take of Covered Species and all those activities necessary to carry out the commitments reflected in the Plan’s Operating Conservation Program and IA.

Covered Species: The species identified in Table 1-4 of the AHCP, which the Plan addresses in a manner sufficient to meet all of the criteria for issuing an incidental take permit under ESA Section 10(a)(1)(B) and all of the criteria for issuing an enhancement of survival permit under ESA Section 10(a)(1)(A), as applicable.

Culvert: Buried pipe structure that allows streamflow or road drainage to pass under a road.

Debris slide: A landslide of mixed particle size, predominantly dry unconsolidated material. May move fast or slow.

Deep-seated landslide: Landslides that have a basal slip plane that is relatively deep and commonly extends into bedrock. These are typically vegetated with trees and/or grass and typically move incrementally.

Degradation (streambed): Erosional removal of materials from one place to another. Degradation lowers the elevation of streambeds and floodplains.

Diameter at breast height (DBH): The diameter of a tree 4.5 feet above the ground on the uphill side of the tree.

Dissolved oxygen: Oxygen found in solution with water in streams and lakes. Solubility is generally measured in mg/l and varies with temperature, salinity, and atmospheric pressure.

Drainage: An area (basin) mostly bounded by ridges or other similar topographic features, encompassing part, most, or all of a watershed.

Drainage area: Total land area draining to any point in a stream, as measured on a map, aerial photo, or other horizontal, two-dimensional projection.

Effective date: The date(s) upon which the ITP and ESP are issued by the Services.

Enhancement of Survival Permit (ESP): A permit issued by the Service(s) pursuant to ESA Section 10(a)(1)(A) for any act that enhances the propagation or survival of a listed species that would otherwise be prohibited by ESA Section 9. The permit that authorizes incidental take of species covered by a CCAA.

Equipment Exclusion Zone (EEZ): An area where use of heavy equipment is not allowed.

Even-aged stand: A stand of trees composed of a single age class in which the range of tree ages is usually +/- 20 percent of rotation.

Even-aged harvest: The application of a combination of actions that results in the creation of even-aged stands. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands.

Feasible: Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, operational, and technological factors, and considering what is allowable under the law.

Felling (timber): Physically cutting a tree from its stump including cutting of the felled tree into predetermined log lengths.

Fine sediment: Sediment with particle size of 2 mm and less, including sand, silt, and clay.

Floodplain: The area adjacent to the stream constructed by the river in the present climate and inundated during periods of high flow.

Forest management: The practical application of biological, physical, quantitative, managerial, economic, social, and policy principles to the regeneration, management, utilization, and conservation of forests to meet specified goals and objectives while maintaining the productivity of the forest.

Geomorphic features: Mass wasting features defined within the AHCP that include; deep-seated landslides (DSL), headwall swales (HWS), riparian slope stability management zones (RSMZ), slope stability management zones (SMZ), and shallow rapid landslides (SRL).

Gradient: Average change in vertical elevation per unit of horizontal distance.

Green Diamond's ownership: Commercial timberlands that Green Diamond owns in fee and lands owned by others subject to Green Diamond harvesting rights.

Ground-based yarding (logging): Movement of logs to a landing by use of tractors, either tracked or rubber tired (rubber tired skidders) or shovels (hydraulic boom log loaders).

Habitat: The place, natural or otherwise, (including climate, food, cover, and water) where an animal, plant, or population naturally or normally lives and develops.

Habitat Conservation Plan (HCP). As defined in the Services' HCP Handbook, a planning document that is a mandatory component of an application for an incidental take permit under ESA Section 10(a)(1)(B); also known as a conservation plan. The document that, among other things, identifies the operating conservation program that will be implemented to minimize, mitigate, and monitor the effects of incidental take on the species covered by a Section 10(a)(1)(B) permit.

Harvesting: All activities necessary to cut, remove, and transport timber products from the Plan Area.

Harvesting Rights: The rights to conduct timber operations on lands owned in fee by another. Short-term harvesting rights generally expire upon the conclusion of timber operations, upon a date certain, or a combination of the two. Perpetual harvesting rights pertain to existing and subsequent crops of timber and continue without expiration.

Hazard Abatement: The process in which the woody debris that remains after harvesting a stand of timber is removed in order to reduce fire hazard.

Headwall swales: Areas of narrow, steep, convergent topography (swales or hollows) located at the heads of Class III watercourses that have been sculpted over geologic time by repeated debris slide and debris flow events.

HPA Group: HPAs that have been grouped together based on their geologic and geomorphic characteristics for purposes applying slope stability measures.

Hydrographic Planning Area (HPA): The hydrographic areas and hydrologic units mapped in the AHCP/CCAA which encompass the Eligible Plan Area and surrounding lands in common watersheds.

Hydrological disconnection: Isolation of the road network such that drainage will not directly enter into watercourses.

Implementation Agreement (IA): An agreement between the Service(s) and the incidental take permittee(s) that identifies the obligations of the parties, identifies remedies if parties fail to meet their obligations, provides assurances to the Service(s) that the conservation plan will be implemented, and provides assurances to the permittee(s) that implementation of the plan satisfies ESA requirements for the species and activities covered by the plan and permit.

Incidental take: The taking of a federally listed species, if such taking is incidental to, and not the purpose of, carrying out otherwise lawful activities.

Incidental Take Permit (ITP): A permit issued by the Services pursuant to ESA Section 10(a)(1)(B) authorizing incidental take of federally listed species named on the permit.

Initial Plan Area: Green Diamond's ownership within the 11 HPAs as of the effective date of the Permits, as depicted in Figure 1-1 of the AHCP.

Inner Gorge: A geomorphic feature formed by coalescing scars originating by coalescing scars originating from landsliding and erosional processes caused by historically active stream erosion. The feature is identified as that area beginning immediately adjacent to the stream channel below extending up slope to the first break in the slope. Inner gorge is a subset of Steep Streamside Slopes.

Landings: The areas where harvested trees are gathered (through skidding or yarding) for subsequent transport out of the forest.

Large woody debris (LWD): Larger pieces of wood in stream channels or on the ground, including logs, root wads, and large chunks of wood that provide important biological and physical functions.

Mainline roads: Roads that support significant amounts of traffic annually from major tracts of timber or provide the main access into a tract for non-harvest management activities.

Mainstem: Principal stem of channel of a drainage system.

Management roads: Roads that are needed to either support long term management activities in the Plan Area or provide access to timber that will be harvested within the next 20 years.

Manning's roughness coefficient: A variable that represents the resistance of the bed of a stream channel to the flow of water in it.

Mass soil movement (mass wasting): All geologic processes in which masses of earth materials move downslope by gravitational forces. Includes, but is not limited to, landslides, rock falls, and debris avalanches. It does not, however, include surface erosion by running water. It may be caused by natural erosional processes, or by natural disturbances (e.g., earthquakes or fire events) or human disturbances (e.g., mining or road construction).

Mass Wasting Prescription Zones (MWPZs): Steep streamside slopes, deep-seated landslides, and headwall swales where slope stability measures will be applied.

Merchantable: Trees or stands having the size, quality, and condition suitable for marketing under a give economic condition, even if not immediately accessible for logging.

National Marine Fisheries Service (NMFS): A division of the U.S. Department of Commerce that is responsible for the stewardship of the nation's marine resources, the protection and recovery of listed marine species, and the authorization of incidental take of listed marine species.

Operating Conservation Program: As defined in 50 CFR §§ 17.3, 222.102, those conservation management activities which are expressly agreed upon and described in a conservation plan or its implementing agreement, if any, and which are to be undertaken for the affected species when implementing an approved conservation plan, including measures to respond to changed circumstances. In this Plan and the IA, the conservation management activities and specific measures (including provisions for changed circumstances, funding, monitoring, reporting, adaptive management, and dispute resolution) as set forth in Section 6.2.

Orthorectified: The process where the effects of image perspective (tilt) and relief (terrain) effects have been removed for the purpose of creating a planimetrically correct image with a constant scale.

Outmigrant: A juvenile salmonid fish that is moving downstream toward the ocean during which a physiological adaptation termed smoltification occurs thus allowing the young fish to survive in a saline environment.

Overstory: That portion of the trees, in a forest of more than one story, forming the upper or uppermost canopy layer.

Parr: Young salmonid, in the stage between alevin and smolt, that has developed distinctive dark "parr marks" on its sides and is actively feeding in fresh water.

Permanent road decommissioning: Decommissioning of a road that will not be needed for future management activities.

Permit or Permits: The incidental take permit (ITP) issued by NMFS to Green Diamond pursuant to ESA Section 10(a)(1)(B) or the enhancement of survival permit (ESP) issued by USFWS to Green Diamond pursuant to ESA Section 10(a)(1)(A) ("ESP"), or both the ITP and the ESP.

Permeability: The rate of water flow through streambed substrate (e.g., gravels).

Physiographic provinces: Geographical areas that are delineated according to common physical characteristics relating to their geology, and geomorphology.

Plan: The Aquatic Habitat Conservation Plan and Candidate Conservation Agreement with Assurances prepared by Green Diamond, dated October 2006.

Plan Area: All commercial timberland acreage within eleven Hydrographic Planning Areas (HPAs) on the west slopes of the Klamath Mountains and the Coast Range of California where Green Diamond owns fee lands and Harvesting Rights (Green Diamond's ownership), during the period of such ownership within the term of the Permits, subject to the limitations described in AHCP Section 1.3.2.3 and in the IA, and up to 100 miles of roads on lands where Green Diamond owns and exercises Road Access Rights within its approved Timber Harvesting Plan (THP) areas in the Eligible Plan Area during the term of the Plan and Permits. This is the geographic area where incidental take will be authorized, the Covered Activities will occur, and the Operating Conservation Program will be implemented. Except where stated otherwise in the Plan, references to lands, commercial timberlands, and Green Diamond's ownership in the context of the Plan Area include lands owned in fee and lands subject to harvesting rights.

Pond: A body of water smaller than a lake, sometimes artificially formed.

Pools: Pools are impoundments of flowing water in streams which are formed by structures such as bedrock, boulders, or woody debris in or adjacent to the stream channel. Velocity conditions within pools generally result in the deposition of finer sediment types.

Population: A collection of individuals that share a common gene pool.

Prescribed burning: Introduction of fire under controlled conditions to remove unwanted brush, logging slash, and/or woody debris or specified forest elements.

Professional Geologist (PG): A person who holds a valid California license as a professional geologist pursuant to California's Department of Consumer Affairs Geologist and Geophysicist Act.

Qualifying slope break: A decline in slope gradient (below the specified minimum slope gradient for the given HPA) and of sufficient distance that it may be reasonably expected to impede sediment delivery to watercourses from shallow landslides originating above the slope break.

Red light threshold: A threshold triggered by multiple negative monitoring responses (a series of yellow light triggers) indicating a more serious condition than the yellow light threshold.

Regeneration: The renewal of tree cover by natural or artificial means. Also the young tree crop (seedlings and saplings).

Registered Professional Forester (RPF): A person who holds a valid license as a professional forester pursuant to Article 3, Section 2, Division 1 of the California Public Resources Code (as in effect on the date of issuance of the Permits).

Riffle: A stream segment characterized by swiftly flowing water with surface agitation and have bars of deposited sediments. Riffles typically occur in areas of increased channel gradient where hydraulic conditions sort transported sediments (gravel, cobble, and boulders).

Riparian: That portion of the watershed or shoreline influenced by surface or subsurface waters, including stream or lake margins, marshes, drainage courses, springs, and seeps. Riparian areas usually have visible vegetative or physical characteristics reflecting the influence of water. Riversides and lake borders are typical riparian areas.

Riparian Management Zone (RMZ): A riparian buffer zone on each side of Class I or Class II watercourses that receive special treatment to provide temperature control, nutrient inputs, channel stability, sediment control, and LWD recruitment.

Riparian Slope Stability Management Zone (RSMZ): A RMZ below an SMZ or where streamside slopes exceed the minimum Steep Streamside Slope gradients. This is the SSS inner zone.

Salmonids: The taxonomic group of fishes belonging to the family Salmonidae including salmon, trout, char and graylings.

Secondary roads: Roads that support periodic traffic into portions of tracts with the level of use dependent upon location of harvest units.

Sediment: Fragments of rock, soil, and organic material transported and deposited by wind, water, or other natural phenomena.

Sedimentation: Deposition of material suspended in water or air, usually when the velocity of the transporting medium drops below the level at which the material can be supported.

Seep: An area of minor ground water outflow onto the land surface or into a stream channel; flows that are too small to be a spring.

Selection harvest: The removal or trees, individually or in small groups, from the forest.

Services: NMFS and USFWS.

Shallow-rapid landslide (SRL): Rapid landslide event that is confined to the overlying mantle of colluvium and weathered bedrock (in some instances competent bedrock) that commonly leave a bare unvegetated scar after failure. These landslides may include debris slides, debris flows, channel bank failures, and rock falls.

Silviculture: The specific methods by which a forest stand or area is harvested and regenerated over time to achieve the desired management objectives.

Size class: The categorization of trees into one of the following four DBH classes: seedling (< 1"), sapling (1" to 4.9"), pole (5" to 11.9"), sawtimber (12" and larger),

Skid trail: An access cut through the woods for skidding logs with ground-based equipment. It is not a high enough standard for use by highway vehicles, such as a log truck, and is therefore not a road.

Slash: Woody residue left on the ground after trees are felled, or accumulated there as a result of a storm, fire, or silvicultural treatment.

Slope break: See Qualifying Slope Break.

Slope Stability Management Zone (SMZ): The outer zone of an SSS zone.

Smolt: Juvenile salmonid that is undergoing physiological changes to cope with a marine environment.

Species: As defined in ESA Section 3(15), “the term ‘species’ included any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.” Also, a population of individuals that are more or less alike and that are able to breed and produce fertile offspring under natural conditions.

Spring: An area of ground water outflow onto the land surface or into a stream channel; flows are greater than a seep.

Stand: A group of trees that possesses sufficient uniformity in composition, structure, age, spatial arrangement, or condition to distinguish it from adjacent groups.

Steep Streamside Slopes (SSS): Steep slopes located immediately adjacent to a stream channel; defined by: 1) a minimum slope gradient leading to a Class I or Class II watercourse, 2) a maximum distance from a Class I or Class II watercourse, and 3) a reasonable ability for slope failures to deliver sediment to a watercourse.

SSS zone: The area in which default prescriptions for SSS will be applied; consists of an inner zone (the RSMZ) and outer zone (the SMZ).

Stream: A natural watercourse with a well-defined channel with distinguishable bed and bank showing evidence of having contained flowing water indicated by deposit of rock, sand, gravel, or soil.

Substrate: Mineral or organic material that forms the bed of a stream.

Summer period: The period from May 15^{th} through October 15^{th}.

Submitted THPs: Total number of AHCP THPs that have been received by CalFire and new letters of notification have been sent to the services during the reporting period. No summary data for these THPs.

Surface erosion: Movement of soil particles down or across a slope, as a result of gravity and a moving medium such as rain or wind. The transport of sediment depends on the steepness of the slope, the texture and cohesion of the soil particles, the activity of rainsplash, sheetwash, gullying, and dry ravel processes, and the presence of vegetation.

Suspended sediment: Sediment suspended in a fluid by the upward components of turbulent currents or by colloidal suspension. That part of a stream’s total sediment load carried in the water column.

Sustained yield: The yield of commercial wood that an area can produce continuously at a given intensity of management consistent with required environmental protection and which is professionally planned to achieve over time a balance between growth and removal.

Take: To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 USCA § 1532(19); 50 CFR § 222.102. "Harm" means an act that actually kills or injures fish or wildlife, which act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including for USFWS species breeding, feeding or sheltering and for NMFS species breeding, spawning, rearing, migrating, feeding or sheltering. 50 CFR §§ 17.3, 222.102.

Tannic water: Water having a high level of dissolved organic compounds from leaf material which give it a dark brown color and reduce water clarity.

Temporary road construction: A road that is built and used only during a timber operation. These roads have a surface adequate for seasonal logging use and have drainage structures, if any, adequate to carry the anticipated flow of water during the period of use. Upon completion of use, all drainage structures are removed.

Temporary road decommissioning: Decommissioning a road that may be used again in the future for management activities but typically not for at least 20 years.

Thalweg: The deepest point of a stream along any channel cross section.

Thinning: A treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or recover potential mortality.

Timber harvesting: All activities necessary to cut, remove, and transport timber products from an area.

Timber Harvesting Plan (THP): A plan describing a proposed timber harvesting operation pursuant to 14 CCR section 4582 (as in effect on the date of issuance of the Permits).

Turbidity: An indicator of the amount of sediment that is suspended in water. It has been used as an expression of the optical properties of a water sample that causes light rays to be scattered and absorbed, rather than transmitted through the sample.

Watercourse: Any well-defined channel with distinguishable bed and bank showing evidence of having contained flowing water indicated by deposit of rock, sand, gravel, or soil. Watercourse also includes manmade watercourses.

Watercourse transition line: That line closest to the watercourse where perennial vegetation is permanently established.

Water drafting: Direct removal of water from a watercourse or pond into a water truck or for storage in reservoirs or tanks for use in dust abatement or fire suppression.

Watershed: The catchment area of land draining into a river, river system, or body of water; the drainage basin contributing water, organic matter, dissolved nutrients, and sediments to a stream or lake.

Winter period: The period from October 16^{th} through May 14^{th}.

Yarding: (Alternatively: skidding). The movement of forest products from the stump to the landing.

Young of the year (YOY): A juvenile fish that is less than one year old.

Yellow light threshold: An early warning indicator identifying and rapidly addressing a potential problem. This threshold typically can be exceeded by a single negative monitoring result.

XIII. Appendices

A. Post-Harvest Forms of Completed THPs

B. Summary Table of Road Treatment Implementation and Effectiveness Monitoring Results from 2021 and 2022

C. 2022 Summer Juvenile Salmonid Population Sampling Program annual report to NMFS

D. 2022 Juvenile Salmonid Outmigrant Trapping Program – Little River annual report to NMFS

Appendix A

Post Harvest Report

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 142101 **GDRCO No:** 142101

RPF: Mohrmann, Z. **CDF No:** 1-22-00173-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	310601	39.24	20.08	19.16				
B	310604	47.99	23.24	21.57	3.18			
C	301204	62.45	15.59	39.16	7.69			
D	310710	22.37	6.29	11.16	4.99			
E	310708	18.17	16.60	1.57				

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
Class III Tier A Modified	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 142101 **GDRCO No:** 142101

RPF: Mohrmann, Z. **CDF No:** 1-22-00173-Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
C	SRL	1F	0.06
C	SRL	1F	0.23
C	SRL	1F	0.40
C	SRL	II-1	0.21
C	SRL	II-1	0.14
C	SRL	II-2	0.39
C	SRL	MOD3A	0.31
C	SRL	MOD3A	1.91
C	SRL	MOD3A	0.10
D	SRL	II-2	0.67
D	SRL	II-2	0.32

Reason Retention Requirements Not Met:

*** N/A ***				
D	SRL	II-2		
Reason Not Met:				
D	SRL	II-2		
Reason Not Met:				

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 142101 **GDRCO No:** 142101

RPF: Mohrmann, Z. **CDF No:** 1-22-00173-Hum

AHCP Exceptions:

Unit	Feature	Exception	Watercourse	Acres of Retention	Clearcut Acres	Exception Met?
C	SRL	Alt Geology	1F	0.11	0.00	Yes
	Reason Not Met?	N/A				
	Description	Alternative prescription includes selection yarding on SRL retaining 75 sq. ft conifer basal area and 50% canopy retention. Ground based equipment is allowable for shovel and feller buncher equipment only.				
C	SRL	Alt Geology	1F	0.19	0.00	Yes
	Reason Not Met?	N/A				
	Description	Alternative prescription includes selection yarding on SRL retaining 75 sq. ft conifer basal area and 50% canopy retention. Ground based equipment is allowable for shovel and feller buncher equipment only.				
C	SRL	Alt Geology	MOD3A	0.81	0.00	Yes
	Reason Not Met?	N/A				
	Description	Alternative prescription includes selection yarding on SRL retaining 75 sq. ft conifer basal area and 50% canopy retention. Ground based equipment is allowable for shovel and feller buncher equipment only.				
C	SRL	Rd const on sha	MOD3A	0.17	0.00	Yes
	Reason Not Met?	N/A				
	Description	Road construction across an active/historic landslide.				
D	SRL	Alt Geology	II-2	0.00	0.15	Yes
	Reason Not Met?	N/A				
	Description	Cable clearcut SRL				
D	SRL	Alt Geology	1F	0.00	0.12	Yes
	Reason Not Met?	N/A				
	Description	Cable clearcut SRL.				
D	SRL	Alt Geology	II-2	0.00	0.10	Yes
	Reason Not Met?	N/A				
	Description	Cable clearcut SRL.				

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 152001 **GDRCO No:** 152001

RPF: Drakeford, J. **CDF No:** 1-21-00022-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	511413	39.74	32.45	7.29				
B	511522	22.19	19.70		2.49			
C	512214	28.07	17.31	10.76				
D	512305	15.52	12.39	3.12				
E	512219	38.03	30.45	7.58				
F	512217	41.93	30.93	10.84	0.16			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
Class III Tier A Modified	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
II-FPR: Class II Forest Practice Rules	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 152001 **GDRCO No:** 152001

RPF: Drakeford, J. **CDF No:** 1-21-00022-Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-1	0.46
C	RSMZ(SSS)	II-2	0.31
D	RSMZ(SSS)	II-2	2.07
F	RSMZ(SSS)	II-2	1.42
F	RSMZ(SSS)	II-2	2.05
F	SRL	MOD3A	0.16
F	SRL	MOD3A	0.27

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 152101 **GDRCO No:** 152101

RPF: Camper, L. **CDF No:** 1-22-00126-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	511013	38.27	30.71	7.56				
B	511508	35.13	23.21	11.91				
C	511507	37.91	24.75	10.85	2.32			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
Class III Tier A Modified	Yes
Class III Tier B	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
B	RSMZ(SSS)	1F	2.41
C	RSMZ(SSS)	1F	2.23

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 172001 **GDRCO No:** 172001

RPF: Mohrmann, Z. **CDF No:** 1-20-00222-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	431603	32.62	29.13		3.49			
B	432806	54.99	22.56	31.58	0.86			
C	432720	47.49	29.10	14.08	4.30			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Seeps/Springs	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
C	DSL	II-2	0.70
C	DSL	II-2	3.76
C	SRL	3A	2.66
C	SRL	3A	2.64

Reason Retention Requirements Not Met:

***** N/A *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 172001 **GDRCO No:** 172001

RPF: Mohrmann, Z. **CDF No:** 1-20-00222-Hum

AHCP Exceptions:

Unit	Feature	Exception	Watercourse	Acres of Retention	Clearcut Acres	Exception Met?
B	DSL	Alt Geology	II-2	11.58		Yes
	Reason Not Met?	N/A				
	Description	Green Diamond proposes to utilize the selection silviculture and ground-based tractor harvest methods on a historically active earthflow.				
B	DSL	Rd const on DSL	II-2	11.58		Yes
	Reason Not Met?	N/A				
	Description	It is proposed to construct a road across a historicaly active landslide, Landslide LS1 in Harvest Unit B.				

Additional Comments

***** None *****

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 172002 **GDRCO No:** 172002

RPF: Kegerreis,J **CDF No:** 1-21-00049-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	440734	29.02	23.03	4.37	1.61			
B	440625	17.42	12.05	5.31				
C	440624	29.51	23.38		6.12			
D	440721	32.71	27.42		5.29			
E	440510	19.33	17.22	1.28	0.81			
F	440828	11.92	10.78		1.14			
G	440827	10.86	8.32	2.54				

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
Class III Tier A Modified	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
II-FPR: Class II Forest Practice Rules	Yes
Ponds	Yes
Wet areas	Yes

Reason Requirements Not Met:

***** N/A *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 172002 **GDRCO No:** 172002

RPF: Kegerreis,J **CDF No:** 1-21-00049-Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	DSL	II-2	0.06
A	SRL	II-2	0.90

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 172203 **GDRCO No:** 172203

RPF: Mohrmann, Z. **CDF No:** 1-23-00034-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	432616	32.08	18.34	6.73	7.01			
B	432622	34.31	9.23	3.06	22.01			
C	433518	29.24	15.68	5.23	8.33			
D	433524	33.35	29.68	0.34	3.33			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Ponds	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-2	1.60
C	RSMZ(SSS)	II-2	4.78
C	SRL	II-2	0.11
C	SRL	II-2	0.27

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 172203 **GDRCO No:** 172203

RPF: Mohrmann, Z. **CDF No:** 1-23-00034-Hum

AHCP Exceptions:

Unit	Feature	Exception	Watercourse	Acres of Retention	Clearcut Acres	Exception Met?
C	SRL	Alt Geology	II-2	1.39	0.00	
Reason Not Met?						
Description	No harvesting within the RSMZ.					

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 222001 **GDRCO No:** 222001

RPF: Drakeford, J. **CDF No:** 1-21-00124-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	512509	34.76	30.59	3.37	0.80			
B	512507	34.85	21.95	11.92	0.98			
C	521918	26.93	20.44	5.36	1.13			
D	522920	42.52	29.28	8.93	4.31			
E	522919	18.82		17.60	1.22			
F	522916	10.95	8.43	1.57	0.94			
G	522821	33.71	29.44	2.02	2.25			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
II-FPR: Class II Forest Practice Rules	Yes
Wet areas	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 222001 **GDRCO No:** 222001

RPF: Drakeford, J. **CDF No:** 1-21-00124-Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
B	RSMZ(SSS)	II-2	0.84
B	RSMZ(SSS)	II-2	0.72
B	SRL	3A	0.61
B	SRL	3A	0.40
B	SRL	3A	0.05
B	SRL	II-2	0.03
B	SRL	II-2	0.11
D	DSL	3A	3.16
D	DSL	3A	0.71
D	DSL	II-2	0.29

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

Unit	Feature	Exception	Watercourse	Acres of Retention	Clearcut Acres	Exception Met?
B	SRL	Alt Geology	3A	0.12	0.05	Yes
	Reason Not Met?	N/A				
	Description	There has been a reduction in the AHCP default landslide buffer due to a significant break in slope.				
B	SRL	Alt Geology	II-2	0.16	0.05	Yes
	Reason Not Met?	N/A				
	Description	There has been a reduction in the AHCP default landslide buffer due to a significant break in slope.				
E	DSL	Alt Geology	II-2	13.50	0.00	Yes
	Reason Not Met?	N/A				
	Description	Custom Exception				
D		Road constr. In RSMZ or SMZ				Yes
	Reason Not Met?	N/A				
	Description	New seasonal road construction in outer zone of RMZ for a Class II-1 wet area.				

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	222001	**GDRCO No:**	222001
RPF:	Drakeford, J.	**CDF No:**	1-21-00124-Hum

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 241401 **GDRCO No:** 241401

RPF: Crocker, K. **CDF No:** 1-15-044H

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	520319	119.02			28.98			
B	521213	63.21			6.35			
C	530608	26.55	23.26		3.30			
D	530810	45.05	15.70	20.98	8.37			
E	530821	31.89	22.02	6.45	3.42			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
Class III Tier A Modified	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Seeps/Springs	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 241401 **GDRCO No:** 241401

RPF: Crocker, K. **CDF No:** 1-15-044H

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-2	0.24
A	RSMZ(SSS)	II-2	0.38
A	RSMZ(SSS)	II-2	0.50
A	RSMZ(SSS)	II-2	0.24
B	DSL	3A	1.97
B	DSL	3A	0.79
B	DSL	3A	0.28
B	SRL	3A	1.21
B	SRL	3A	0.97
D	DSL	II-2	12.79
D	RSMZ(SSS)	II-2	0.83
D	RSMZ(SSS)	II-2	6.32
D	SMZ(SSS)	II-2	0.49
D	SRL	II-2	0.10
D	SRL	II-2	0.10
D	SRL	II-2	0.10

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 241901 **GDRCO No:** 241901

RPF: Mohrmann, Z. **CDF No:** 1-20-00019HUM

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	530609	28.48	25.12	3.35				
B	530715	36.53	25.12	11.40				
C	530718	21.38	18.66	2.72				
D	530711	18.37	10.50	5.37	2.50			
E	530705	16.34	10.45		5.89			
F	530722	249.11			23.32			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
Class III Tier B	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Ponds	Yes
Wet areas	Yes

Reason Requirements Not Met:

***** N/A *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 241901 **GDRCO No:** 241901

RPF: Mohrmann, Z. **CDF No:** 1-20-00019HUM

Geology

Unit	Feature	Watercourse	Acres of Retent.
D	RSMZ(SSS)	II-2	0.89
D	RSMZ(SSS)	II-2	0.61
D	RSMZ(SSS)	II-2	2.05
E	RSMZ(SSS)	II-2	0.72
F	RSMZ(SSS)	II-2	1.14

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 262002 **GDRCO No:** 262002

RPF: East, R. **CDF No:** 1-21-00019-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	621232	49.91	7.19	28.64	14.08			
B	621223	8.30	6.55	1.75				
C	630717	30.64	24.99	5.24	0.41			
D	620114	39.85	30.23	9.25	0.37			
E	630603	31.04	23.05	5.90	2.09			
F	620122	43.99	26.57	16.72	0.70			
G	630728	23.49	21.40	1.13	0.96			
H	630721	19.50	13.96	1.50	4.04			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 262002 **GDRCO No:** 262002

RPF: East, R. **CDF No:** 1-21-00019-Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
D	CMZ	1F	0.26
D	SRL	1F	0.16
E	DSL	1F	0.27
E	SRL	1F	0.40
H	DSL	II-2	4.02

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 262101 **GDRCO No:** 262101

RPF: Kegerreis,J **CDF No:** 1-22-00038-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	633029	8.84	6.48	2.36				
B	633107	39.13	31.03		8.19			
C	623607	35.18	27.64		7.54			
D	623605	25.45	19.84	5.09	0.52			
E	623615	8.05	2.93	4.90	0.23			
F	520104	26.67	21.32	1.17	4.17			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
Class III Tier B	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
II-FPR: Class II Forest Practice Rules	Yes
Seeps/Springs	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 262101 **GDRCO No:** 262101

RPF: Kegerreis,J **CDF No:** 1-22-00038-Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-1	2.26
B	RSMZ(SSS)	II-2	2.59
B	SRL	II-2	0.38
C	RSMZ(SSS)	II-1	0.53
C	RSMZ(SSS)	II-1	0.21
C	RSMZ(SSS)	II-2	4.94
D	RSMZ(SSS)	II-1	0.14
D	RSMZ(SSS)	II-1	2.09
D	RSMZ(SSS)	II-2	0.82
E	RSMZ(SSS)	II-2	0.75
E	RSMZ(SSS)	II-2	0.29
E	RSMZ(SSS)	II-2	0.13
E	SRL	II-2	0.19
E	SRL	II-2	0.20

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 262303 **GDRCO No:** 262303

RPF: Twohig, Skyler **CDF No:** 1-24-00035 Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	530536	54.35	31.72	17.00	5.63			
B	530809	46.86	31.48	9.60	5.77			
C	530409	38.42	24.81	11.94	1.67			
D	530517	23.79	13.72	3.91	6.16			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 262303 **GDRCO No:** 262303

RPF: Twohig, Skyler **CDF No:** 1-24-00035 Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	DSL	II-2	2.45
A	RSMZ(SSS)	II-2	1.10
A	SRL	II-2	0.28
B	SRL	II-1	0.05
B	SRL	II-2	0.52
B	SRL	II-2	0.15
D	DSL	II-2	0.76
D	DSL	II-2	4.32
D	DSL	II-2	0.05
D	SRL	II-2	0.27
D	SRL	II-2	0.25
D	SRL	II-2	0.06
D	SRL	II-2	0.07
D	SRL	II-2	0.06
D	SRL	II-2	0.01
D	SRL	II-2	0.02
D	SRL	II-2	0.01
D	SRL	II-2	0.01
D	SRL	II-2	0.04

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 272201 **GDRCO No:** 272201

RPF: Pope,N **CDF No:** 1-22-00148-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	633327	135.15			11.29			

Riparian

Feature	Requirements Met?
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 352201

GDRCO No: 352201

RPF: Camper, L.

CDF No: 1-22-00137-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	712307	43.90	31.55	5.59	6.77			
B	712304	35.05	30.53	3.98	0.53			
C	711604	34.30	26.25	8.05				
D	711623	13.35	11.82		1.53			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
Class III Tier A Modified	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
II-FPR: Class II Forest Practice Rules	Yes
Wet areas	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 422002 **GDRCO No:** 422002

RPF: Kegerreis,J **CDF No:** 1-21-00091-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	721709	26.56	23.60	1.77	1.19			
B	722017	26.68	23.49	3.19				
C	722118	30.54	19.20	11.34				
D	722217	43.03	25.51	6.86	10.65			
E	722214	30.92	27.51	3.41				
F	722314	36.99	26.33	10.66				
G	722803	32.50	22.57	9.93				
H	722607	17.94	12.76	5.18				
I	722825	36.23	25.68	10.54				

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
Class III Tier B	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Seeps/Springs	Yes
Wet areas	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 422002 **GDRCO No:** 422002

RPF: Kegerreis,J **CDF No:** 1-21-00091-Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
B	RSMZ(SSS)	II-1	0.55
D	RSMZ(SSS)	II-1	0.39
D	RSMZ(SSS)	II-2	0.60
D	RSMZ(SSS)	II-2	0.81
D	RSMZ(SSS)	II-2	1.14
I	RSMZ(SSS)	II-2	0.72
I	RSMZ(SSS)	II-2	3.09

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 422101 **GDRCO No:** 422101

RPF: Camper, L. **CDF No:** 1-22-00069-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	720915	36.50	26.81	9.66				
B	721607	34.97	30.95	0.49	3.53			
C	721615	35.59	31.18	4.41				
D	721613	46.62	30.99	10.66	4.97			
E	722019	39.21	29.60	9.61				
F	721711	44.48	30.08	14.40				

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Ponds	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-1	0.55
A	RSMZ(SSS)	II-2	0.39
E	RSMZ(SSS)	II-1	1.18
F	RSMZ(SSS)	II-1	1.36

Reason Retention Requirements Not Met:

***** N/A *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	422101	**GDRCO No:**	422101
RPF:	Camper, L.	**CDF No:**	1-22-00069-Hum

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 422201 **GDRCO No:** 422201

RPF: Kegerreis,J **CDF No:** 1-23-00055 Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	721526	40.64	30.36	10.28				
B	722436	33.65	30.18	2.96	0.51			
C	722602	33.41	14.60	17.74	1.07			
D	722725	37.39	25.48	9.06	2.85			
E	722712	29.34	25.93	0.74	2.67			
F	723512	31.58	29.35	1.15	1.09			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
Class III Tier B	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
C	RSMZ(SSS)	II-2	5.43
C	SRL	II-2	0.19
D	SRL	1F	1.94
D	SRL	1F	0.15
D	SRL	1F	0.30

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	422201	**GDRCO No:**	422201
RPF:	Kegerreis,J	**CDF No:**	1-23-00055 Hum

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 431904 **GDRCO No:** 431904

RPF: Smith, S. **CDF No:** 1-20-00016 Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	711423	58.86			3.21			
B	711320	46.40			2.16			
C	711319	5.15						
D	711318	16.57						
E	712408	31.53			0.92			
F	722025	43.90			2.39			
G	722917	29.47			1.40			

Riparian

Feature	Requirements Met?
Class I	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
II-FPR: Class II Forest Practice Rules	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 432202 **GDRCO No:** 432202

RPF: Kegerreis,J **CDF No:** 1-22-00106 Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	823123	20.88	16.01	4.87				
B	720412	27.27	19.14		8.14			
C	720414	21.46	19.54	0.94	0.97			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 432204 **GDRCO No:** 432204

RPF: MahonyMoyer, Evan **CDF No:** 1-23-00016-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	723022	75.61						
B	723023	81.45			0.56			

Riparian

Feature	Requirements Met?
II-1: Class II 1st Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 432301 **GDRCO No:** 432301

RPF: Twohig, Skyler **CDF No:** 1-23EX-00084-HUM

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	813331	40.54			0.19			
B	813332	58.88			5.13			
C	813438	26.23			0.31			
D	812727	37.54			0.81			
E	812324	64.39			0.76			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
Class III Tier A Modified	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 471606 **GDRCO No:** 471606

RPF: Camper, L. **CDF No:** 1-16-137H

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	820726	14.18	11.45		2.73			
B	821804	27.90	21.42	6.49				
C	820725	41.77	24.26	4.88	12.62			
D	820608	43.32			43.32			
E	820619	44.91	25.52	19.39				
F	810116	8.21	3.03	2.60	2.58			
G	810422	29.54	27.31	1.51	0.72			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Wet areas	Yes

Reason Requirements Not Met:

***** N/A *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 471606 **GDRCO No:** 471606

RPF: Camper, L. **CDF No:** 1-16-137H

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	DSL	II-2	0.32
A	DSL	II-2	2.45
A	DSL	II-2	0.10
B	RSMZ(SSS)	II-2	0.48
B	RSMZ(SSS)	II-2	2.31
C	DSL	II-2	13.10
E	RSMZ(SSS)	II-1	1.29
E	RSMZ(SSS)	II-2	0.73
F	DSL	II-2	2.51
G	RSMZ(SSS)	II-1	0.54
G	RSMZ(SSS)	II-1	0.27

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 471606 **GDRCO No:** 471606

RPF: Camper, L. **CDF No:** 1-16-137H

AHCP Exceptions:

Unit	Feature	Exception	Watercourse	Acres of Retention	Clearcut Acres	Exception Met?
C	DSL	Alt Geology	II-1	0.15		Yes
	Reason Not Met?	N/A				
	Description	Selection on deep-seated landslide L1.				
C	DSL	Alt Geology	II-1	0.31		Yes
	Reason Not Met?	N/A				
	Description	Selection on deep-seated landslide L1.				
C	DSL	Alt Geology	II-1	0.48		Yes
	Reason Not Met?	N/A				
	Description	Selection on deep-seated landslide L1.				
C	DSL	Alt Geology	II-1	0.61		Yes
	Reason Not Met?	N/A				
	Description	Selection on deep-seated landslide L1.				
C	DSL	Alt Geology	II-1	0.96		Yes
	Reason Not Met?	N/A				
	Description	Selection on deep-seated landslide L1.				
C	DSL	Alt Geology	II-1	1.09		Yes
	Reason Not Met?	N/A				
	Description	Selection on deep-seated landslide L1.				
C	DSL	Alt Geology	II-2	0.28		Yes
	Reason Not Met?	N/A				
	Description	Selection on deep-seated landslide L1.				
F	DSL	Alt Geology	II-2	0.07		Yes
	Reason Not Met?	N/A				
	Description	Selection on deep-seated Landslide L4				
F	DSL	Alt Geology	II-2	0.10		Yes
	Reason Not Met?	N/A				
	Description	Selection on deep-seated landslide L4				

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	471606	**GDRCO No:**	471606
RPF:	Camper, L.	**CDF No:**	1-16-137H

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 471901 **GDRCO No:** 471901

RPF: Camper, L. **CDF No:** 1-19-00215 Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	801108	40.54	26.09	13.82	0.62			

Riparian

Feature	Requirements Met?
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-2	0.92
A	SRL	II-1	0.15

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 471902 **GDRCO No:** 471902

RPF: East, R. **CDF No:** 1-19-00150 Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	810718	42.11	31.82	10.29				
B	811821	4.00	2.25	1.75				
C	811820	73.03			14.13			
D	811712	42.97	29.83	13.15				
E	811718	34.55	21.39	13.16				
F	811616	45.27	32.45	12.82				
G	811525	29.51	26.11	3.40				
H	812203	25.90	23.17	2.73				

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
Class III Tier A Modified	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
E	HWS	II-1	0.15

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	471902	**GDRCO No:**	471902
RPF:	East, R.	**CDF No:**	1-19-00150 Hum

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 472101 **GDRCO No:** 472101

RPF: Twohig, Skyler **CDF No:** 1-21-00147-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	911401	37.88	25.09	11.80	0.99			
B	912210	34.63	29.77	4.86				
C	912316	28.11	24.81	3.30				
D	912624	39.32	30.30	9.02				
E	912626	36.34	25.87	10.47				

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	DSL	II-2	0.52
A	SRL	II-1	0.39
A	SRL	II-1	0.39
A	SRL	II-2	0.57

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	472101	**GDRCO No:**	472101
RPF:	Twohig, Skyler	**CDF No:**	1-21-00147-Hum

Additional Comments

***** None *****

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 472104 **GDRCO No:** 472104

RPF: Mohrmann, Z. **CDF No:** 1-21-00120-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1013325	39.42	19.25	13.00				
B	1013324	26.22	21.96	4.26				
C	910409	37.94	22.65	5.77				
D	910813	38.75	25.34	13.41				
E	911624	22.84	20.33	2.51				
F	911627	37.96	18.28	10.80	2.26			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
Class III Tier B	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Wet areas	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
C	RSMZ(SSS)	II-1	0.73
C	RSMZ(SSS)	II-2	0.77
F	SRL	II-1	0.44

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 472104 **GDRCO No:** 472104

RPF: Mohrmann, Z. **CDF No:** 1-21-00120-Hum

AHCP Exceptions:

Unit	Feature	Exception	Watercourse	Acres of Retention	Clearcut Acres	Exception Met?
A	DSL	Alt Geology	II-1	6.39	0.00	Yes
	Reason Not Met?	N/A				
	Description	Selection Silviculture within an unstable feature.				
F	DSL	Alt Geology	II-1	3.23		Yes
	Reason Not Met?	N/A				
	Description	A deep seated landslide proposes cable yarding single tree selection (>100 sq. ft retention).				
F	DSL	Alt Geology	II-2	2.05		Yes
	Reason Not Met?	N/A				
	Description	No harvesting within Deep-Seated Landslide				
F	DSL	Alt Geology	II-1	2.52		Yes
	Reason Not Met?	N/A				
	Description	Single Tree Selection within a DSL.				

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 472105 **GDRCO No:** 472105

RPF: MahonyMoyer, Evan **CDF No:** 1-22-00016-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	911612	18.35	16.19		2.16			
B	911508	24.22	19.81	4.41				

Riparian

Feature	Requirements Met?
II-1: Class II 1st Order	Yes
Seeps/Springs	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
B	RSMZ(SSS)	II-2	1.22
B	RSMZ(SSS)	II-2	1.27

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 472106 **GDRCO No:** 472106

RPF: Kirk,Christopher **CDF No:** 1-22-00037-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	912127	25.86	23.22	2.64				
B	912725	20.63	12.64	7.99				
C	912818	44.81	34.70	10.11				
D	913410	32.35	9.52	22.83				

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Wet areas	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 472201 **GDRCO No:** 472201

RPF: Kirk,Christopher **CDF No:** 1-22-00144 Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	923105	29.83	26.75	3.08				
B	820727	32.27	21.22	11.01	0.04			
C	820728	18.64	16.86		1.79			
D	820724	30.62	25.08	4.97	0.57			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Ponds	
Seeps/Springs	

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
B	SRL	II-2	0.04
C	DSL	3A	0.79
D	DSL	II-1	0.57

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	472201	**GDRCO No:**	472201
RPF:	Kirk,Christopher	**CDF No:**	1-22-00144 Hum

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 472301 **GDRCO No:** 472301

RPF: Cole,T **CDF No:** 1-23-00102 Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	910507	36.05	28.94	6.49	0.61			
B	910504	45.81	24.76	9.64	11.41			
C	910702	35.05	23.94	1.16	9.95			
D	910820	42.72	19.16	16.64	7.01			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
II-FPR: Class II Forest Practice Rules	Yes
Wet areas	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 472301 **GDRCO No:** 472301

RPF: Cole,T **CDF No:** 1-23-00102 Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-1	0.15
A	SRL	II-1	0.75
B	DSL	II-2	3.04
B	RSMZ(SSS)	1F	1.64
B	RSMZ(SSS)	II-2	1.76
B	RSMZ(SSS)	II-2	0.11
B	SRL	II-1	0.15
B	SRL	II-1	0.20
B	SRL	II-1	0.22
B	SRL	II-1	0.35
B	SRL	II-1	0.10
B	SRL	II-2	0.25
D	DSL	1F	2.87
D	SRL	II-2	0.03

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 482101 **GDRCO No:** 482101

RPF: Matthew Lewis **CDF No:** 1-22-00013-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	721009	30.24	20.66	9.59				
B	721121	33.12	18.61	2.72	11.78			
C	721415	35.14	27.88	6.27	0.99			
D	721126	28.27	18.55	3.56	6.16			
E	721125	42.19	25.19	5.22	11.78			
F	823417	34.28	30.62		3.73			
G	720206	30.71	26.92		3.79			
H	720112	30.71	21.07	5.62	4.02			
I	823614	39.12	25.74	1.05	12.33			
J	823615	38.22	29.60	4.74	3.89			
K	833118	34.13	30.39		3.74			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
Class III Tier B	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-2	1.36
B	DSL	1F	0.66
B	RSMZ(SSS)	II-2	1.16

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Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

Geology

Unit	Feature	Watercourse	Acres of Retent.	Retent. Req. Met?
B	SRL	1F	0.75	Yes
B	SRL	II-2	0.56	Yes
B	SRL	II-2	0.48	Yes
B	SRL	II-2	0.30	Yes
B	SRL	II-2	1.00	Yes
C	RSMZ(SSS)	II-2	1.13	Yes
C	RSMZ(SSS)	II-2	1.19	Yes
C	SRL	II-2	0.05	Yes
C	SRL	II-2	0.18	Yes
C	SRL	II-2	0.16	Yes
D	RSMZ(SSS)	1F	0.98	Yes
D	SMZ(SSS)	1F	0.16	Yes
E	RSMZ(SSS)	II-1	1.49	Yes
E	RSMZ(SSS)	II-2	1.58	Yes
E	RSMZ(SSS)	II-2	0.49	Yes
E	SRL	1F	0.22	Yes
E	SRL	II-2	0.14	Yes
H	HWS	II-2	0.28	Yes
H	RSMZ(SSS)	II-2	1.16	Yes
H	RSMZ(SSS)	II-2	1.50	Yes
H	SRL	II-2	0.25	Yes
H	SRL	II-2	0.44	Yes
H	SRL	II-2	0.25	Yes
I	RSMZ(SSS)	II-2	0.83	Yes
I	RSMZ(SSS)	II-2	1.89	Yes
I	RSMZ(SSS)	II-2	0.84	Yes
J	RSMZ(SSS)	1F	0.89	Yes

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

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GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 482101 **GDRCO No:** 482101

RPF: Matthew Lewis **CDF No:** 1-22-00013-Hum

AHCP Exceptions:

Unit	Feature	Exception	Watercourse	Acres of Retention	Clearcut Acres	Exception Met?
C		Class II skid intrusion				Yes
	Reason Not Met?	N/A				
	Description	Unit C the use of approximately 150 feet of existing skid trial in the RMZ of a class II-1 wet area is proposed.				
D		par log suspension RMZ				Yes
	Reason Not Met?	N/A				
	Description	In Unit D an area has been identified where partial log suspension through the Class II RMZ,				
E		Class II skid intrusion				Yes
	Reason Not Met?	N/A				
	Description	Unit E the use of approximately 130 feet of existing skid trail in the outer zone of a RMZ of a class II-2 watercourse.				
E		par log suspension RMZ				A
	Reason Not Met?	Wasnt used. Shovel yarded logs up to a favorable area that avoided partial suspension through the WLPZ.				
	Description	in Unit E an area has been identified where partial log suspension through the Class II RMZ				

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 482103 **GDRCO No:** 482103

RPF: East, R. **CDF No:** 1-22-00019-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	822401	30.31	26.87	0.83	2.62			
B	821323	31.10	27.94	3.16				
C	822409	20.50	18.04	2.46				
D	822313	25.20	22.52	2.57	0.11			
E	822310	37.61	32.55	5.07				

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
Class III Tier B	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Seeps/Springs	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
D	SRL	II-1	0.09

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 482201 **GDRCO No:** 482201

RPF: MahonyMoyer, Evan **CDF No:** 1-23-00089 Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	822314	32.51	14.26	14.98	3.27			
B	822427	35.33	31.61		3.72			
C	822405	29.68	24.98	2.97	1.74			
D	831901	44.78	29.20	14.24	1.34			
E	822418	24.03	20.89	1.06	2.09			
F	822528	33.88	21.52	12.36				

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
Class III Tier B	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Seeps/Springs	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 482201 **GDRCO No:** 482201

RPF: MahonyMoyer, Evan **CDF No:** 1-23-00089 Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-1	0.62
A	SRL	II-1	0.16
A	SRL	II-1	0.09
A	SRL	II-2	0.04
A	SRL	II-2	0.53
D	DSL	II-1	0.21
D	RSMZ(SSS)	1F	0.38
D	RSMZ(SSS)	II-2	0.69
D	RSMZ(SSS)	II-2	0.49
D	SRL	II-2	0.17
F	RSMZ(SSS)	II-2	1.73

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

Unit	Feature	Exception	Watercourse	Acres of Retention	Clearcut Acres	Exception Met?
A	DSL	Alt Geology	II-2	11.72		
	Reason Not Met?					
	Description	Custom Exception				
D	SRL	Alt Geology	II-2	0.38		
	Reason Not Met?					
	Description	75 square feet retention on body of slide				

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 512002 **GDRCO No:** 512002

RPF: Kegerreis,J **CDF No:** 1-21-00015-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1020210	24.95	22.07		2.88			
B	1031818	35.21	30.80	2.30	2.11			
C	1031826	18.88	16.97		1.91			

Riparian

Feature	Requirements Met?
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 512102 **GDRCO No:** 512102

RPF: Twohig, Skyler **CDF No:** 1-22-00026-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	921002	34.01	29.50	4.07	0.45			
B	920207	24.81	18.37	2.89	3.55			
C	920212	43.93	29.51	7.72	6.71			
D	1023632	26.38	23.83	0.92	1.63			
E	920111	25.17	22.35	2.82				
F	920105	17.80	14.74	2.89	0.17			
G	930611	30.03	26.47	3.20	0.36			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
C	SRL	II-2	0.20
F	SRL	II-2	0.23
F	SRL	II-2	0.12
G	SRL	3A	0.59
G	SRL	3A	0.33

Reason Retention Requirements Not Met:

***** N/A *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	512102	**GDRCO No:**	512102
RPF:	Twohig, Skyler	**CDF No:**	1-22-00026-Hum

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 562101 **GDRCO No:** 562101

RPF: Freeman,C **CDF No:** 1-21-00087-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1020830	21.15	17.58	3.56				
B	1020828	33.60	27.68	5.93				
C	1020806	23.24	12.60	10.64				
D	1020703	39.26	24.23	11.82	3.21			
E	1020820	50.77	30.99	19.78				
F	1020819	34.52	30.62	3.90				
G	1021629	30.80	24.29	6.51				

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
D	RSMZ(SSS)	II-1	0.71
D	SMZ(SSS)	II-1	0.65

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	562101	**GDRCO No:**	562101
RPF:	Freeman,C	**CDF No:**	1-21-00087-Hum

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 562102 **GDRCO No:** 562102

RPF: Coulter,E **CDF No:** 1-21-00168-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1223010	27.24	18.90	3.84	4.51			
B	1222807	30.24	24.34	5.89				
C	1223323	22.88	10.98	6.70	5.19			
D	1223319	21.62	17.41	4.21				
E	1120514	34.63	28.35	4.85	1.43			
F	1223215	37.41	17.80	5.95	13.66			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Seeps/Springs	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 562102 **GDRCO No:** 562102

RPF: Coulter,E **CDF No:** 1-21-00168-Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-2	3.12
A	SRL	II-2	1.22
A	SRL	II-2	0.53
C	RSMZ(SSS)	II-2	3.33
C	SRL	II-1	0.14
C	SRL	II-1	0.31
C	SRL	II-1	0.36
C	SRL	II-1	0.22
C	SRL	II-2	0.21
C	SRL	II-2	0.58
C	SRL	II-2	0.28
C	SRL	II-2	0.21
E	RSMZ(SSS)	II-1	1.23
F	RSMZ(SSS)	II-2	5.82
F	SRL	II-1	0.33
F	SRL	II-1	0.72
F	SRL	II-2	1.40
F	SRL	II-2	0.08
F	SRL	II-2	0.09
F	SRL	II-2	0.38
F	SRL	II-2	0.35

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 562102

GDRCO No: 562102

RPF: Coulter,E

CDF No: 1-21-00168-Hum

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 562103 **GDRCO No:** 562103

RPF: Hurst, R. **CDF No:** 1-23-00074-Hum

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1020817	34.89	19.82	1.49	13.58			
B	1020421	35.18	29.35	3.73	2.09			
C	1020413	31.79	25.49	4.45	1.84			
D	1123311	31.57	21.57	1.98	8.02			
E	1123333	35.91	30.10	5.81				

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 562103 **GDRCO No:** 562103

RPF: Hurst, R. **CDF No:** 1-23-00074-Hum

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-1	0.25
A	RSMZ(SSS)	II-2	1.32
A	SMZ(SSS)	II-1	0.21
A	SRL	II-2	0.37
A	SRL	II-2	0.25
C	SRL	II-2	1.28
C	SRL	II-2	0.49
D	RSMZ(SSS)	II-2	2.42
D	SRL	II-2	1.96
D	SRL	II-2	0.35
D	SRL	II-2	0.20
D	SRL	II-2	0.15

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 562301 **GDRCO No:** 562301

RPF: MahonyMoyer, Evan **CDF No:** 1-23EM-00013-HUM

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1122807	2.81			0.12			

Riparian

Feature	Requirements Met?
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 662201

GDRCO No: 662201

RPF: Coulter,E

CDF No: 1-23-00091 Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1313406	37.54	20.61	2.20	14.72			
B	1313514	23.70	19.98		3.71			
C	1210227	36.97	26.06	3.87	7.04			

Riparian

Feature	Requirements Met?
Class I	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
II-FPR: Class II Forest Practice Rules	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 712102 **GDRCO No:** 712102

RPF: Cody,Reid **CDF No:** 1-21-00166-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1410920	41.21	21.57	6.36	13.28			
B	1410934	36.95	19.45	10.10	7.40			
C	1411625	34.16	16.87	9.08	8.21			
D	1411515	39.31	27.51	9.88	1.92			
E	1411628	28.23	18.61	5.10	4.53			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 712102 **GDRCO No:** 712102

RPF: Cody,Reid **CDF No:** 1-21-00166-Del

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	1F	8.94
A	SMZ(SSS)	1F	4.54
A	SMZ(SSS)	II-1	3.22
A	SRL	3A	0.04
A	SRL	3A	0.20
B	RSMZ(SSS)	1F	3.77
B	RSMZ(SSS)	II-1	0.74
B	RSMZ(SSS)	II-1	1.62
B	SMZ(SSS)	1F	4.33
B	SMZ(SSS)	II-1	1.62
B	SMZ(SSS)	II-1	0.76
C	RSMZ(SSS)	1F	2.71
C	RSMZ(SSS)	II-1	4.37
C	SMZ(SSS)	1F	3.36
C	SMZ(SSS)	II-1	3.68
C	SRL	II-1	0.16
C	SRL	II-1	0.08
C	SRL	II-1	0.54
C	SRL	II-1	0.10
D	RSMZ(SSS)	II-1	1.82
D	SMZ(SSS)	II-1	1.58
E	RSMZ(SSS)	II-2	4.59
E	SMZ(SSS)	II-2	3.51

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	712102	**GDRCO No:**	712102
RPF:	Cody,Reid	**CDF No:**	1-21-00166-Del

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 712103 **GDRCO No:** 712103

RPF: Hurst, R. **CDF No:** 1-21-00189-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1411125	17.88	8.35	6.40	3.13			
B	1411132	27.21	25.14	0.88	1.19			
C	1410127	24.72	10.20	6.35	8.17			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 712103 **GDRCO No:** 712103

RPF: Hurst, R. **CDF No:** 1-21-00189-Del

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-1	1.48
A	SRL	1F	1.23
A	SRL	1F	0.76
C	RSMZ(SSS)	II-2	1.42
C	RSMZ(SSS)	II-2	0.99
C	RSMZ(SSS)	II-2	2.20
C	SMZ(SSS)	II-2	2.50
C	SMZ(SSS)	II-2	0.42
C	SRL	II-2	0.06
C	SRL	II-2	0.67
C	SRL	II-2	0.10
C	SRL	II-2	0.69
C	SRL	II-2	0.10
C	SRL	II-2	1.33
C	SRL	II-2	0.13

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 712104 **GDRCO No:** 712104

RPF: Freeman,C **CDF No:** 1-22-00107 Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1512927	41.14	26.00	8.79	6.35			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 712201 **GDRCO No:** 712201

RPF: Hurst, R. **CDF No:** 1-23-00010-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1410341	33.69	29.85	1.52	2.33			
B	1411516	17.66	13.59	1.76	2.32			
C	1411527	30.16	25.54		4.62			
D	1412216	31.06	15.00	0.28	15.77			
E	1412336	19.50	11.70	3.01	4.79			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 712201 **GDRCO No:** 712201

RPF: Hurst, R. **CDF No:** 1-23-00010-Del

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	SRL	3B	0.07
A	SRL	MOD3A	0.27
B	RSMZ(SSS)	II-1	1.97
B	SMZ(SSS)	II-1	0.39
B	SMZ(SSS)	II-1	1.06
D	SMZ(SSS)	II-2	0.49
D	SRL	II-2	2.70
D	SRL	II-2	4.92
E	RSMZ(SSS)	II-1	0.61

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 732101 **GDRCO No:** 732101

RPF: Hurst, R. **CDF No:** 1-21-00192-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1412804	34.38	20.90	9.08	4.40			
B	1412619	25.09	22.21	1.85	1.03			
C	1412620	31.70	19.31	3.88	8.52			
D	1412614	26.53	11.25	3.87	11.41			
E	1412326	31.27	19.20	9.24	2.83			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 732101 **GDRCO No:** 732101

RPF: Hurst, R. **CDF No:** 1-21-00192-Del

Geology

Unit	Feature	Watercourse	Acres of Retent.
B	RSMZ(SSS)	II-1	0.86
B	SMZ(SSS)	II-1	0.94
C	RSMZ(SSS)	II-2	2.87
C	SMZ(SSS)	II-2	0.55
C	SMZ(SSS)	II-2	2.04
C	SRL	II-2	0.15
C	SRL	II-2	0.02
E	SRL	II-2	0.41
E	SRL	II-2	0.28
E	SRL	II-2	0.84
E	SRL	II-2	0.31
E	SRL	II-2	1.03
E	SRL	II-2	0.11
E	SRL	II-2	0.28
E	SRL	II-2	0.23
E	SRL	II-2	0.03
E	SRL	II-2	0.21

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 732102 **GDRCO No:** 732102

RPF: Dobosh, B. **CDF No:** 1-21-00195-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
B	1320519	39.42			7.58			
C	1320514	42.49	25.32	10.28	6.89			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

Unit	Feature	Exception	Watercourse	Acres of Retention	Clearcut Acres	Exception Met?
B		Class III skid crossing				Yes
	Reason Not Met?	N/A				
	Description	Use of existing legacy skid trails and skid trail crossings within Class III EEZ areas.				

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 732103 **GDRCO No:** 732103

RPF: Hurst, R. **CDF No:** 1-22-00021-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1412324	36.77	23.38	3.34	10.05			
B	1412333	28.17	22.65	2.69	2.83			
C	1412427	18.92	16.77	1.62	0.53			
D	1412433	37.85	21.46	6.87	9.52			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 732103 **GDRCO No:** 732103

RPF: Hurst, R. **CDF No:** 1-22-00021-Del

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-1	2.84
A	SMZ(SSS)	II-1	1.01
A	SRL	II-1	3.20
A	SRL	II-1	1.17
A	SRL	II-1	0.31
A	SRL	II-1	1.65
A	SRL	II-1	0.24
A	SRL	II-1	0.14
B	RSMZ(SSS)	II-1	0.55
B	RSMZ(SSS)	II-1	0.16
B	RSMZ(SSS)	II-1	0.48
B	RSMZ(SSS)	II-1	0.84
B	RSMZ(SSS)	II-1	1.66
B	RSMZ(SSS)	II-2	2.03
D	RSMZ(SSS)	II-1	2.58
D	RSMZ(SSS)	II-2	0.63
D	RSMZ(SSS)	II-2	1.19
D	RSMZ(SSS)	II-2	0.74
D	RSMZ(SSS)	II-2	0.35
D	RSMZ(SSS)	II-2	0.22
D	SMZ(SSS)	II-1	0.76
D	SMZ(SSS)	II-2	0.17
D	SMZ(SSS)	II-2	0.10
D	SMZ(SSS)	II-2	0.23
D	SRL	II-2	0.13

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	732103	**GDRCO No:**	732103
RPF:	Hurst, R.	**CDF No:**	1-22-00021-Del

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 851901 **GDRCO No:** 851901

RPF: Dobosh, B. **CDF No:** 1-20-00008 Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1423323	31.21	16.72	12.47	2.02			
B	1320319	24.52	8.86	12.66	3.00			
C	1320312	23.97	11.65	7.80	4.52			
D	1320316	32.21	14.63	11.71	5.89			
E	1320828	33.76	12.39	11.70	9.67			
F	1320831	16.56	14.98	1.57				

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 851901 **GDRCO No:** 851901

RPF: Dobosh, B. **CDF No:** 1-20-00008 Del

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-2	2.05
A	SMZ(SSS)	II-2	1.34
B	DSL	3A	0.31
B	DSL	3A	0.60
B	RSMZ(SSS)	1F	0.86
B	SMZ(SSS)	1F	0.68
B	SRL	1F	0.23
B	SRL	1F	0.42
C	RSMZ(SSS)	1F	4.17
C	SMZ(SSS)	1F	0.77
C	SMZ(SSS)	1F	0.76
E	CMZ	1F	1.87
E	RSMZ(SSS)	1F	3.85
E	RSMZ(SSS)	II-2	3.48
E	SMZ(SSS)	1F	2.94
E	SMZ(SSS)	II-2	2.43

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

Unit	Feature	Exception	Watercourse	Acres of Retention	Clearcut Acres	Exception Met?
B	SRL	Alt Geology	II-1	0.53		Yes
	Reason Not Met?	N/A				
	Description	Curtailment of buffer at outboard edge of existing road upslope				

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 852002 **GDRCO No:** 852002

RPF: Dobosh, B. **CDF No:** 1-21-00146-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1320818	27.65	24.84	2.81				
B	1320834	44.45		1.15	6.68			
C	1320924	33.09	24.92	4.81	3.36			
D	1321026	20.19	17.48	2.71				
E	1321633	29.85	18.89	6.54	4.42			
F	1321526	10.93	5.81	4.91	0.22			

Riparian

Feature	Requirements Met?
Class I	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
Seeps/Springs	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 852002 **GDRCO No:** 852002

RPF: Dobosh, B. **CDF No:** 1-21-00146-Del

Geology

Unit	Feature	Watercourse	Acres of Retent.
B	RSMZ(SSS)	II-1	0.84
B	SRL	3A	0.07
B	SRL	3A	0.18
B	SRL	II-2	1.22
B	SRL	II-2	0.95
C	SRL	II-2	0.79
C	SRL	II-2	0.46
C	SRL	II-2	0.78
C	SRL	II-2	0.24
C	SRL	II-2	0.95
C	SRL	II-2	1.04
E	SRL	II-1	0.27
E	SRL	II-1	0.71
F	SRL	1F	0.06
F	SRL	II-2	0.08

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 852201 **GDRCO No:** 852201

RPF: Dobosh, B. **CDF No:** 1-23-00002-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1423215	19.34	6.30	5.54	7.59			
B	1423326	32.05	28.36	3.69				
C	1320428	14.93	11.77	0.50	2.66			
D	1320436	20.17	18.17	2.00				
E	1320402	27.90	17.37	3.03	7.50			
F	1320931	28.10	21.74	6.37				
G	1321724	25.18	19.75	4.39	1.04			
H	1321625	25.06	20.58	1.55	2.94			
I	1321721	13.68	11.07	2.31	0.30			

Riparian

Feature	Requirements Met?
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 852201 **GDRCO No:** 852201

RPF: Dobosh, B. **CDF No:** 1-23-00002-Del

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-1	0.51
A	RSMZ(SSS)	II-1	1.84
A	RSMZ(SSS)	II-1	2.05
A	RSMZ(SSS)	II-2	2.63
A	SMZ(SSS)	II-1	1.29
A	SMZ(SSS)	II-1	0.42
A	SMZ(SSS)	II-1	0.13
A	SMZ(SSS)	II-1	0.19
A	SMZ(SSS)	II-1	0.30
A	SMZ(SSS)	II-2	0.40
C	SRL	3B	2.41
E	RSMZ(SSS)	II-2	3.75
E	SMZ(SSS)	II-2	2.79
E	SRL	II-1	0.25
E	SRL	II-1	0.11
E	SRL	II-1	0.02
G	RSMZ(SSS)	II-1	0.55
G	RSMZ(SSS)	II-1	0.23
G	SMZ(SSS)	II-1	2.08
G	SRL	II-1	0.18
G	SRL	II-1	0.30
H	SRL	II-1	2.76
H	SRL	II-1	1.11

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 852201 **GDRCO No:** 852201

RPF: Dobosh, B. **CDF No:** 1-23-00002-Del

AHCP Exceptions:

Unit	Feature	Exception	Watercourse	Acres of Retention	Clearcut Acres	Exception Met?
I	SRL	Alt Geology	3B	0.26		Yes
Reason Not Met?		N/A				
Description		An unstable area on a seasonal road to be re-opened. The outer edged of the road prism has eroded and partially slumped. Curtailed buffer less than 50 feet in width above proposed road reconstruction.				
I	SRL	Alt Geology	3B	0.11		Yes
Reason Not Met?		N/A				
Description		Reduction in buffer above exisiting road				

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 852202 **GDRCO No:** 852202

RPF: Freeman,C **CDF No:** 1-23-00009-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1422028	34.49	27.48	2.53	4.49			

Riparian

Feature	Requirements Met?
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	SRL	II-1	0.36
A	SRL	II-1	0.46
A	SRL	II-1	0.10

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 932101 **GDRCO No:** 932101

RPF: Freeman,C **CDF No:** 1-21-00141-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1811919	7.41	3.34	2.93	1.14			
B	1813027	62.92	31.32	25.99	5.61			
C	1813002	35.63	29.60	6.03				
D	1813028	39.40	24.77	11.85	2.78			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
Class III Tier A Modified	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
No Riparian Features	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	CMZ	1F	0.92
B	CMZ	1F	3.90
B	SRL	II-1	0.10

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	932101	**GDRCO No:**	932101
RPF:	Freeman,C	**CDF No:**	1-21-00141-Del

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 932103 **GDRCO No:** 932103

RPF: Freeman,C **CDF No:** 1-22-00066-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1812902	47.89	15.86	14.32	17.72			
B	1812910	44.63	23.76	15.22	5.64			
C	1812906	40.05	30.37	4.51	5.17			
D	1813223	30.56	17.15	11.36	2.06			
E	1813220	33.91	14.96	18.95				
F	1813012	16.61	11.50	4.97	0.13			
G	1813101	36.37	29.55	6.38	0.44			
H	1813132	33.12	18.93	14.19				
I	1813204	49.63	29.73	19.90				
J	1813113	18.19	16.24	1.96				
K	1813234	32.29	18.79	3.36	10.14			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
II-FPR: Class II Forest Practice Rules	Yes
Wet areas	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
A	RSMZ(SSS)	II-1	0.29

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

Geology

Unit	Feature	Watercourse	Acres of Retent.	Retent. Req. Met?
A	RSMZ(SSS)	II-1	0.59	Yes
A	RSMZ(SSS)	II-2	0.63	Yes
A	RSMZ(SSS)	II-2	1.62	Yes
A	RSMZ(SSS)	II-2	1.60	Yes
B	DSL	1F	1.10	Yes
B	DSL	II-2	0.04	Yes
B	DSL	II-2	0.20	Yes
B	RSMZ(SSS)	II-2	0.44	Yes
B	RSMZ(SSS)	II-2	0.55	Yes
B	SRL	II-2	0.45	Yes
C	RSMZ(SSS)	1F	0.33	Yes
C	RSMZ(SSS)	II-1	0.33	Yes
C	RSMZ(SSS)	II-1	0.34	Yes
C	RSMZ(SSS)	II-2	0.56	Yes
C	RSMZ(SSS)	II-2	0.36	Yes
C	SRL	1F	0.16	Yes
C	SRL	1F	0.21	Yes
E	DSL	1F	11.04	Yes
F	SRL	II-1	0.12	Yes
K	DSL	II-1	0.90	Yes
K	DSL	II-2	0.55	Yes
K	DSL	II-2	0.48	Yes
K	RSMZ(SSS)	II-1	3.19	Yes
K	RSMZ(SSS)	II-1	0.51	Yes
K	RSMZ(SSS)	II-1	0.16	Yes
K	RSMZ(SSS)	II-1	0.23	Yes
K	RSMZ(SSS)	II-2	0.57	Yes
K	SRL	1F	0.06	Yes
K	SRL	1F	0.15	Yes
K	SRL	1F	0.11	Yes
K	SRL	II-1	0.18	Yes

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

Geology

Unit	Feature	Watercourse	Acres of Retent.	Retent. Req. Met?
K	SRL	II-1	0.10	Yes
K	SRL	II-1	0.07	Yes
K	SRL	II-2	0.11	Yes

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 932201 **GDRCO No:** 932201

RPF: MacAdsm, Samuel **CDF No:** 1-23-00015-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1811625	29.07	22.05		7.02			
B	1812134	27.26	19.40	5.38	2.48			

Riparian

Feature	Requirements Met?
Class I	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

***** None *****

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 952101 **GDRCO No:** 952101

RPF: Freeman,C **CDF No:** 1-22-00002-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1702417	34.31			6.26			
B	1702415	13.16	11.46	1.71				
C	1702416	26.18	12.51	10.77	2.89			
D	1702521	13.82						
E	1702520	21.82	16.96	4.86				
F	1702522	71.70			17.01			
G	1702523	38.89			1.05			

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes

Reason Requirements Not Met:

***** N/A *****

GREEN DIAMOND RESOURCE COMPANY

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 952101 **GDRCO No:** 952101

RPF: Freeman,C **CDF No:** 1-22-00002-Del

Geology

Unit	Feature	Watercourse	Acres of Retent.
C	RSMZ(SSS)	1F	2.78
C	RSMZ(SSS)	1F	0.10
C	RSMZ(SSS)	1F	1.01
C	RSMZ(SSS)	1F	0.23
C	RSMZ(SSS)	II-1	0.73
C	SMZ(SSS)	1D	0.23
C	SRL	1D	0.10
C	SRL	3B	0.06
C	SRL	II-1	0.25
C	SRL	II-1	0.16
C	SRL	II-2	0.05
C	SRL	II-2	0.12
C	SRL	II-2	0.13
C	SRL	II-2	0.07
C	SRL	MOD3A	0.01

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

Additional Comments

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

GREEN DIAMOND RESOURCE COMPANY

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name: 952201 **GDRCO No:** 952201

RPF: Freeman,C **CDF No:** 1-22-00172-Del

Units

Unit	TTRRSSLL	Gross Acres	Clear Cut Acres	Selection Acres	No Harvest Acres	In Unit ROW Acres	Out Unit ROW Acres	Other Acres
A	1701301	25.80	22.43	3.35	0.01			
B	1702414	29.61	25.77	2.55	1.29			
C	1702121	28.05	24.31	1.24	2.50			
D	1702208	33.55	20.09	13.46				

Riparian

Feature	Requirements Met?
Class I	Yes
Class III Tier A	Yes
Class III Tier A Modified	Yes
II-1: Class II 1st Order	Yes
II-2: Class II 2nd Order	Yes
II-FPR: Class II Forest Practice Rules	Yes
Wet areas	Yes

Reason Requirements Not Met:

***** N/A *****

Geology

Unit	Feature	Watercourse	Acres of Retent.
C	SRL	II-1	0.13

Reason Retention Requirements Not Met:

***** N/A *****

AHCP Exceptions:

***** None *****

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

AHCP Post Harvest Report

Begin Date: 1/1/2023, End Date: 12/31/2024, Status: Completed

THP Name:	952201	**GDRCO No:**	952201
RPF:	Freeman,C	**CDF No:**	1-22-00172-Del

Additional Comments

***** None *****

Appendix B

Summary Table of Road Treatment Implementation and Effectiveness Monitoring Results from 2023 and 2024

GDRCO #	State #	Road Point	Pre-Winter Inspection Date	RPF Pre-Inspection	Post-winter Inspection Date	RPF Post-Inspection	Functional Status	Notes
011903	1-20-00175-HUM	02	Nov 17 2022	Haley Weaver	Nov 1 2023	Haley Weaver	Functional	
011903	1-20-00175-HUM	04	Nov 17 2022	Haley Weaver	Nov 1 2023	Haley Weaver	Functional	
011903	1-20-00175-HUM	05	Sep 8 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011903	1-20-00175-HUM	06	Sep 8 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011903	1-20-00175-HUM	14	Aug 1 2023	Haley Weaver	Nov 1 2023	Haley Weaver	Functional	
011903	1-20-00175-HUM	19.1	Sep 8 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011903	1-20-00175-HUM	22	Sep 8 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	01	Sep 9 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	03	Sep 9 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	04	Sep 9 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	05	Sep 9 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	06	Sep 9 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	06.1	Sep 9 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	07	Sep 9 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	09	Sep 8 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	11	Sep 8 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	13	Sep 8 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	14	Sep 8 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	15	Sep 8 2022	Others	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	16	Sep 8 2022	Others	Sep 26 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	17	Sep 8 2022	Others	Sep 26 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	18	Sep 9 2022	Others	Sep 26 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	19	Sep 9 2022	Others	Sep 26 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	20	Sep 9 2022	Others	Sep 26 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	21	Nov 17 2022	Haley Weaver	Nov 1 2023	Haley Weaver	Functional	
011905	1-21-00175-Hum	22	Nov 17 2022	Haley Weaver	Nov 1 2023	Haley Weaver	Functional	
012101	1-22-00052-Hum	01	Aug 22 2024	Haley Weaver			Functional	
012101	1-22-00052-Hum	02	Aug 15 2024	Haley Weaver			Functional	
012101	1-22-00052-Hum	03	Sep 26 2023	Haley Weaver	Aug 22 2024	Haley Weaver	Functional	
012101	1-22-00052-Hum	04	Sep 26 2023	Haley Weaver	Aug 22 2024	Haley Weaver	Functional	
012101	1-22-00052-Hum	05	Sep 26 2023	Haley Weaver	Aug 22 2024	Haley Weaver	Functional	
012101	1-22-00052-Hum	06	Sep 26 2023	Haley Weaver	Aug 22 2024	Haley Weaver	Functional	
012101	1-22-00052-Hum	07	Sep 26 2023	Haley Weaver	Aug 22 2024	Haley Weaver	Functional	
012101	1-22-00052-Hum	08	Sep 26 2023	Haley Weaver	Aug 22 2024	Haley Weaver	Functional	
012101	1-22-00052-Hum	10	Sep 26 2023	Haley Weaver	Aug 22 2024	Haley Weaver	Functional	
012101	1-22-00052-Hum	11	Nov 18 2024	Haley Weaver			Functional	
012101	1-22-00052-Hum	12	Sep 26 2023	Haley Weaver	Aug 22 2024	Haley Weaver	Functional	
012101	1-22-00052-Hum	14	Sep 26 2023	Haley Weaver	Aug 22 2024	Haley Weaver	Functional	
012301	1-24-00019 Hum	01	Nov 18 2024	Haley Weaver			Functional	
012301	1-24-00019 Hum	02	Nov 18 2024	Haley Weaver			Functional	
012301	1-24-00019 Hum	03	Nov 18 2024	Haley Weaver			Functional	
012301	1-24-00019 Hum	11	Nov 18 2024	Haley Weaver			Functional	
012301	1-24-00019 Hum	14	Dec 30 2024	Nalani Ludington			Functional	
022101	1-22-00108 Hum	01	Oct 31 2023	Haley Weaver	Nov 18 2024	Haley Weaver	Functional	
022101	1-22-00108 Hum	02	Oct 31 2023	Haley Weaver	Nov 18 2024	Haley Weaver	Functional	
022101	1-22-00108 Hum	09	Oct 31 2023	Haley Weaver	Nov 18 2024	Haley Weaver	Functional	
091501	1-15-068H	05	Nov 17 2022	Haley Weaver	Nov 13 2023	Perris Alfonzo	Functional	
091501	1-15-068H	08	Sep 23 2022	Lillian Judevine	Nov 13 2023	Perris Alfonzo	Functional	
092001	1-21-00011-Hum	08	Nov 3 2022	Haley Weaver	Nov 9 2023	Perris Alfonzo	Functional	
092001	1-21-00011-Hum	09	Nov 3 2022	Haley Weaver	Nov 9 2023	Perris Alfonzo	Functional	
092001	1-21-00011-Hum	10	Nov 3 2022	Haley Weaver	Nov 9 2023	Perris Alfonzo	Functional	
092001	1-21-00011-Hum	11	Nov 3 2022	Haley Weaver	Nov 9 2023	Perris Alfonzo	Functional	

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092001	1-21-00011-Hum	RH-1000_01	Nov 17 2022	Haley Weaver	Nov 13 2023	Perris Alfonzo	Functional	
142001	1-20-00124-Hum	11	Jan 22 2025	Brittney Tresenrider			Functional	
142001	1-20-00124-Hum	12	Jan 22 2025	Brittney Tresenrider			Functional	
142101	1-22-00173-Hum	PWA_31	Jan 22 2025	Brittney Tresenrider			Functional	
142101	1-22-00173-Hum	PWA_32	Jan 22 2025	Brittney Tresenrider			Functional	
142301	1-24-00027 Hum	RP 11	Jan 27 2025	Brittney Tresenrider			Functional	
142301	1-24-00027 Hum	RP 12	Jan 27 2025	Brittney Tresenrider			Functional	
152101	1-22-00126-Hum	2	Nov 6 2023	Brendan Quintero	Aug 12 2024	Haley Weaver	Functional	
171102	1-12-007HUM	15	Oct 10 2013	RPF - D Madsen	Jun 6 2024	RPF	Functional	
172002	1-21-00049-Hum	01	Oct 20 2022	Travis Wills-Pendley	Oct 24 2023	Others	Functional	
172002	1-21-00049-Hum	03	Oct 20 2022	Travis Wills-Pendley	Oct 24 2023	Others	Functional	
172002	1-21-00049-Hum	04	Oct 24 2022	Travis Wills-Pendley	Oct 24 2023	Others	Functional	
172002	1-21-00049-Hum	05	Oct 24 2022	Travis Wills-Pendley	Oct 24 2023	Others	Functional	
172002	1-21-00049-Hum	06	Oct 20 2022	Travis Wills-Pendley	Oct 24 2023	Others	Functional	
172201	1-23-00033-Hum	01	Jan 30 2025	Brittney Tresenrider			Functional	
172201	1-23-00033-Hum	02	Jan 30 2025	Brittney Tresenrider			Functional	
172201	1-23-00033-Hum	03	Jan 30 2025	Brittney Tresenrider			Pre non-compliant	Both sides over steepened with exposed soil.
172201	1-23-00033-Hum	04	Jan 30 2025	Brittney Tresenrider			Functional	
172201	1-23-00033-Hum	05	Oct 4 2023	Others	Jan 30 2025	Brittney Tresenrider	Functional	
172202	1-23-00053-Hum	03	Jan 16 2025	Perris Alfonzo			Functional	
172202	1-23-00053-Hum	04	Dec 31 2024	Austin Nolan			Functional	
172202	1-23-00053-Hum	05	Jan 16 2025	Perris Alfonzo			Functional	
172202	1-23-00053-Hum	06	Jan 16 2025	Perris Alfonzo			Functional	
172202	1-23-00053-Hum	07	Jan 13 2025	Austin Nolan			Functional	
172202	1-23-00053-Hum	09	Dec 31 2024	Austin Nolan			Functional	
172203	1-23-00034-Hum	01	Jan 29 2025	Brittney Tresenrider			Functional	
172203	1-23-00034-Hum	02	Jan 29 2025	Brittney Tresenrider			Functional	
172203	1-23-00034-Hum	04	Jan 29 2025	Brittney Tresenrider			Functional	
172203	1-23-00034-Hum	05	Jan 29 2025	Brittney Tresenrider			Functional	
172203	1-23-00034-Hum	06	Jan 29 2025	Brittney Tresenrider			Functional	
172203	1-23-00034-Hum	07	Jan 29 2025	Brittney Tresenrider			Functional	
172204	1-23-00014-Hum	05	Oct 26 2023	Others	Jan 29 2025	Brittney Tresenrider	Functional	
172301	1-24-00001 Hum	08	Jan 30 2025	Brittney Tresenrider			Functional	
172301	1-24-00001 Hum	09	Jan 30 2025	Brittney Tresenrider			Pre non-compliant	Culvert installed compliant to AHCP standards. A knickpoint has eroded the channel.
182001	1-20-00207-Hum	11	Oct 24 2023	Others	Jan 16 2025	Perris Alfonzo	Functional	
182001	1-20-00207-Hum	12	Oct 24 2023	Others	Jan 16 2025	Perris Alfonzo	Functional	
182001	1-20-00207-Hum	13	Oct 24 2023	Others	Jan 16 2025	Perris Alfonzo	Functional	
182001	1-20-00207-Hum	19	Jul 7 2022	Nalani Ludington	Mar 22 2024	Brendan Quintero	Functional	
191801	1-19-00074-HUM	01	Nov 29 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
191801	1-19-00074-HUM	02	Nov 29 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
191801	1-19-00074-HUM	05	Nov 29 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
191801	1-19-00074-HUM	06	Nov 29 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
191801	1-19-00074-HUM	07	Nov 29 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
191801	1-19-00074-HUM	08	Nov 29 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
191801	1-19-00074-HUM	09	Nov 29 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
191801	1-19-00074-HUM	10	Nov 29 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
222001	1-21-00124-Hum	01	Sep 22 2022	Others	Oct 27 2023	Others	Functional	
222001	1-21-00124-Hum	02	Sep 26 2022	Haley Weaver	Oct 27 2023	RPF	Functional	
222001	1-21-00124-Hum	03	Sep 26 2022	Haley Weaver	Oct 27 2023	Others	Functional	
222001	1-21-00124-Hum	04	Sep 26 2022	Haley Weaver	Oct 27 2023	Others	Functional	
222001	1-21-00124-Hum	05	Jan 28 2025	Austin Nolan			Functional	
222001	1-21-00124-Hum	10	Sep 14 2022	Haley Weaver	Oct 27 2023	Others	Functional	
222001	1-21-00124-Hum	11	Sep 14 2022	Haley Weaver	Oct 27 2023	Others	Functional	
222001	1-21-00124-Hum	12	Sep 14 2022	Haley Weaver	Oct 27 2023	Others	Functional	

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222001	1-21-00124-Hum	13	Jan 14 2025	Brittney Tresenrider			Functional	
222001	1-21-00124-Hum	14	Jan 14 2025	Brittney Tresenrider			Functional	
222001	1-21-00124-Hum	15	Jan 14 2025	Brittney Tresenrider			Functional	
222001	1-21-00124-Hum	18	Oct 10 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
222001	1-21-00124-Hum	19	Oct 10 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
222001	1-21-00124-Hum	20	Oct 10 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
222001	1-21-00124-Hum	21	Oct 10 2022	Others	Nov 8 2023	Perris Alfonzo	Functional	
222001	1-21-00124-Hum	22	Dec 2 2022	Others	Oct 18 2023	Others	Functional	
222001	1-21-00124-Hum	23	Dec 2 2022	Others	Oct 18 2023	Others	Functional	
222001	1-21-00124-Hum	26	Oct 12 2022	Haley Weaver	Oct 26 2023	Others	Functional	
222001	1-21-00124-Hum	27	Oct 12 2022	Haley Weaver	Oct 26 2023	Others	Functional	
222001	1-21-00124-Hum	28	Sep 30 2022	Others	Oct 26 2023	Others	Functional	
222001	1-21-00124-Hum	29	Sep 30 2022	Others	Oct 26 2023	Others	Functional	
222001	1-21-00124-Hum	30	Nov 29 2022	Others	Oct 26 2023	Others	Functional	
222201	1-23-00112 Hum	01	Jan 27 2025	Austin Nolan			Functional	
222201	1-23-00112 Hum	02	Jan 28 2025	Austin Nolan			Functional	
222201	1-23-00112 Hum	03	Jan 28 2025	Austin Nolan			Functional	
222201	1-23-00112 Hum	04	Jan 27 2025	Austin Nolan			Functional	
222201	1-23-00112 Hum	05	Jan 27 2025	Austin Nolan			Functional	
222201	1-23-00112 Hum	07	Jan 27 2025	Austin Nolan			Functional	
222201	1-23-00112 Hum	08	Jan 27 2025	Austin Nolan			Functional	
222201	1-23-00112 Hum	09	Jan 27 2025	Austin Nolan			Functional	
222201	1-23-00112 Hum	10	Jan 27 2025	Austin Nolan			Functional	
222201	1-23-00112 Hum	11	Jan 28 2025	Austin Nolan			Pre non-compliant	Significant erosion of OBF. Fill deems to be poorly compacted.
222201	1-23-00112 Hum	14	Jan 27 2025	Austin Nolan			Pre non-compliant	Poor compaction of fill.
241901	1-20-00019HUM	16	Dec 19 2024	Austin Nolan			Pre non-compliant	Discconect non functional
242001	1-21-00016-Hum	01	Dec 19 2024	Austin Nolan			Functional	
242001	1-21-00016-Hum	02	Dec 19 2024	Austin Nolan			Functional	
242001	1-21-00016-Hum	03	Dec 19 2024	Austin Nolan			Functional	
242001	1-21-00016-Hum	04	Dec 19 2024	Austin Nolan			Functional	
242001	1-21-00016-Hum	05	Dec 19 2024	Austin Nolan			Functional	
242001	1-21-00016-Hum	06	Dec 19 2024	Austin Nolan			Functional	
242001	1-21-00016-Hum	07	Dec 19 2024	Austin Nolan			Functional	
242001	1-21-00016-Hum	08	Dec 19 2024	Austin Nolan			Functional	
242001	1-21-00016-Hum	09	Dec 19 2024	Austin Nolan			Functional	
242001	1-21-00016-Hum	10	Dec 19 2024	Austin Nolan			Functional	
242001	1-21-00016-Hum	16	Sep 23 2022	Travis Wills-Pendley	Oct 26 2023	Others	Functional	
242001	1-21-00016-Hum	17	Sep 23 2022	Travis Wills-Pendley	Oct 26 2023	Others	Functional	
242001	1-21-00016-Hum	18	Sep 23 2022	Travis Wills-Pendley	Oct 26 2023	Others	Functional	
242001	1-21-00016-Hum	19	Sep 23 2022	Travis Wills-Pendley	Oct 26 2023	Others	Functional	
242001	1-21-00016-Hum	20	Sep 23 2022	Travis Wills-Pendley	Oct 26 2023	Others	Functional	
242001	1-21-00016-Hum	21	Sep 23 2022	Travis Wills-Pendley	Oct 26 2023	Others	Functional	
242001	1-21-00016-Hum	22	Sep 23 2022	Travis Wills-Pendley	Oct 26 2023	Others	Functional	
242201	1-22-00118-Hum	3	Jan 30 2025	Austin Nolan			Functional	
261602	1-16-083H	3	Oct 18 2023	Others	Jul 24 2024	Perris Alfonzo	Functional	
261602	1-16-083H	A	Oct 18 2023	Others	Jul 24 2024	Perris Alfonzo	Pre non-compliant, Post Compliant	
261602	1-16-083H	B	Oct 18 2023	Brendan Quintero	Jul 24 2024	Perris Alfonzo	Pre non-Compliant, Post complinat	Large portion of road work not treated with seed/straw/slash and left bare. Potential for delivery to watercourse.
261801	1-18-00109 HUM	03	Sep 12 2022	Lillian Judevine	Sep 26 2023	Others	Functional	
261801	1-18-00109 HUM	06	Nov 8 2022	Others	Sep 26 2023	Others	Functional	
261901	1-19-00161 HUM	03	Oct 18 2023	Others	Jan 27 2025	Perris Alfonzo	Functional	
261901	1-19-00161 HUM	04	Oct 18 2023	Others	Jan 27 2025	Perris Alfonzo	Functional	
261901	1-19-00161 HUM	12	Oct 22 2024	Others			Functional	
262002	1-21-00019-Hum	01	Nov 18 2024	Austin Nolan			Functional	

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262002	1-21-00019-Hum	02	Nov 18 2024	Austin Nolan			Functional	
262002	1-21-00019-Hum	03	Dec 28 2021	Travis Wills-Pendley	Oct 26 2023	Others	Functional	
262002	1-21-00019-Hum	04	Dec 28 2021	Travis Wills-Pendley	Oct 26 2023	Others	Functional	
262002	1-21-00019-Hum	06	Oct 31 2022	Haley Weaver	Oct 26 2023	Others	Functional	
262002	1-21-00019-Hum	07	Oct 31 2022	Haley Weaver	Oct 26 2023	Others	Functional	
262002	1-21-00019-Hum	09	Oct 31 2022	Haley Weaver	Oct 26 2023	Others	Functional	
262002	1-21-00019-Hum	11	Oct 31 2022	Haley Weaver	Oct 26 2023	Others	Functional	
262002	1-21-00019-Hum	12	Oct 31 2022	Haley Weaver	Oct 26 2023	Others	Functional	
262002	1-21-00019-Hum	13	Oct 31 2022	Haley Weaver	Oct 26 2023	Others	Functional	
262002	1-21-00019-Hum	14	Oct 13 2022	Others	Nov 14 2023	Perris Alfonzo	Functional	
262002	1-21-00019-Hum	15	Oct 13 2022	Others	Nov 14 2023	Perris Alfonzo	Functional	
262002	1-21-00019-Hum	16	Oct 13 2022	Others	Nov 14 2023	Perris Alfonzo	Functional	
262002	1-21-00019-Hum	18	Oct 31 2022	Haley Weaver	Nov 14 2023	Perris Alfonzo	Functional	
262101	1-22-00038-Hum	4	Oct 27 2023	Others	Oct 22 2024	Others	Functional	
262101	1-22-00038-Hum	5	Oct 27 2023	Others	Jan 29 2025	Austin Nolan	Functional	
262102	1-22-00194-Hum	01	Sep 26 2023	Others	Jul 24 2024	Perris Alfonzo	Functional	
262102	1-22-00194-Hum	02	Sep 26 2023	Others	Jul 24 2024	Perris Alfonzo	Functional	
262102	1-22-00194-Hum	04	Oct 22 2024	Perris Alfonzo			Functional	
262102	1-22-00194-Hum	06	Oct 18 2023	Others	Jul 24 2024	Perris Alfonzo	Functional	
262102	1-22-00194-Hum	07	Oct 18 2023	Others	Jul 24 2024	Perris Alfonzo	Functional	
262102	1-22-00194-Hum	08	Oct 18 2023	Others	Jul 24 2024	Perris Alfonzo	Functional	
262102	1-22-00194-Hum	10	Oct 22 2024	Perris Alfonzo			Functional	
262102	1-22-00194-Hum	11	Oct 22 2024	Perris Alfonzo			Functional	
262102	1-22-00194-Hum	12	Oct 22 2024	Perris Alfonzo			Functional	
262102	1-22-00194-Hum	13	Oct 22 2024	Perris Alfonzo			Functional	
262102	1-22-00194-Hum	14	Jan 29 2025	Austin Nolan			Functional	
262102	1-22-00194-Hum	15	Jan 29 2025	Austin Nolan			Functional	
262102	1-22-00194-Hum	16	Oct 22 2024	Perris Alfonzo			Functional	
262102	1-22-00194-Hum	17	Oct 22 2024	Others			Functional	
262102	1-22-00194-Hum	17.1	Oct 22 2024	Others			Functional	
262102	1-22-00194-Hum	18	Oct 22 2024	Perris Alfonzo			Functional	
262102	1-22-00194-Hum	19	Oct 22 2024	Others			Functional	
262102	1-22-00194-Hum	20	Oct 22 2024	Perris Alfonzo			Functional	
262102	1-22-00194-Hum	22	Jan 27 2025	Perris Alfonzo			Functional	
262102	1-22-00194-Hum	23	Jan 27 2025	Perris Alfonzo			Functional	
262102	1-22-00194-Hum	23	Jan 29 2025	Austin Nolan			Functional	
262102	1-22-00194-Hum	24	Jan 27 2025	Perris Alfonzo			Functional	
262102	1-22-00194-Hum	24	Jan 29 2025	Austin Nolan			Functional	
262102	1-22-00194-Hum	25	Dec 6 2023	Brendan Quintero	Jul 24 2024	Perris Alfonzo	Functional	
262102	1-22-00194-Hum	26	Dec 6 2023	Brendan Quintero	Jul 24 2024	Perris Alfonzo	Functional	
262102	1-22-00194-Hum	27	Dec 6 2023	Brendan Quintero	Jul 24 2024	Perris Alfonzo	Functional	
262102	1-22-00194-Hum	31	Dec 6 2023	Brendan Quintero	Jul 24 2024	Perris Alfonzo	Functional	
262102	1-22-00194-Hum	32	Dec 6 2023	Brendan Quintero	Jul 24 2024	Perris Alfonzo	Functional	
262102	1-22-00194-Hum	33	Dec 6 2023	Brendan Quintero	Jul 24 2024	Perris Alfonzo	Functional	
262301	1-24-00010 Hum	01	Nov 18 2024	Austin Nolan			Functional	
262301	1-24-00010 Hum	02	Nov 18 2024	Austin Nolan			Functional	
262301	1-24-00010 Hum	03	Nov 18 2024	Austin Nolan			Functional	
262301	1-24-00010 Hum	11	Nov 18 2024	Austin Nolan			Functional	
262301	1-24-00010 Hum	12	Nov 18 2024	Austin Nolan			Functional	
262301	1-24-00010 Hum	14	Nov 18 2024	Austin Nolan			Functional	
262301	1-24-00010 Hum	15	Nov 18 2024	Austin Nolan			Functional	
262303	1-24-00035 Hum	03	Nov 14 2024	Austin Nolan			Functional	
262303	1-24-00035 Hum	05	Nov 14 2024	Austin Nolan			Pre non-compliant	Crossing not pulled to standard.
262303	1-24-00035 Hum	07	Nov 14 2024	Austin Nolan			Functional	
262303	1-24-00035 Hum	08	Nov 14 2024	Austin Nolan			Functional	
262303	1-24-00035 Hum	09	Nov 14 2024	Austin Nolan			Functional	

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262303	1-24-00035 Hum	10	Nov 14 2024	Austin Nolan			Functional	
262303	1-24-00035 Hum	12	Nov 14 2024	Austin Nolan			Functional	
262303	1-24-00035 Hum	13	Nov 14 2024	Austin Nolan			Functional	
262303	1-24-00035 Hum	14	Nov 14 2024	Austin Nolan			Functional	
262303	1-24-00035 Hum	15	Nov 14 2024	Austin Nolan			Functional	
262303	1-24-00035 Hum	16	Nov 14 2024	Austin Nolan			Functional	
262303	1-24-00035 Hum	17	Nov 14 2024	Austin Nolan			Functional	
262303	1-24-00035 Hum	18	Dec 19 2024	Austin Nolan			Functional	
271801	1-18-084HUM	11	Oct 31 2022	Haley Weaver	Nov 15 2023	Perris Alfonzo	Functional	
272001	1-21-00046-Hum	01	Oct 31 2022	Haley Weaver	Nov 15 2023	Perris Alfonzo	Functional	
272001	1-21-00046-Hum	05	Oct 31 2022	Haley Weaver	Oct 17 2023	Others	Functional	
272101	1-22-00059-Hum	2	Nov 30 2022	Others	Oct 17 2023	Others	Functional	
272101	1-22-00059-Hum	3	Nov 30 2022	Others	Oct 17 2023	Others	Functional	
272101	1-22-00059-Hum	8	Nov 29 2022	Others	Oct 18 2023	Others	Functional	
272101	1-22-00059-Hum	9	Nov 29 2022	Others	Oct 18 2023	Others	Functional	
272301	1-23-00179 Hum	1	Oct 29 2024	Others			Functional	
272301	1-23-00179 Hum	2	Oct 29 2024	Others			Functional	
272301	1-23-00179 Hum	4	Oct 29 2024	Others			Functional	
272301	1-23-00179 Hum	6	Oct 29 2024	Others			Functional	
272301	1-23-00179 Hum	07	Oct 29 2024	Others			Functional	
272302	1-23-00129 Hum	1	Jan 30 2025	Austin Nolan			Functional	
272302	1-23-00129 Hum	1.1	Jan 30 2025	Austin Nolan			Functional	
272302	1-23-00129 Hum	2	Jan 30 2025	Austin Nolan			Functional	
272302	1-23-00129 Hum	3	Jan 30 2025	Austin Nolan			Functional	
272302	1-23-00129 Hum	4	Jan 30 2025	Austin Nolan			Functional	
272302	1-23-00129 Hum	5	Jan 30 2025	Austin Nolan			Functional	
352201	1-22-00137-Hum	01	Nov 10 2023	Brendan Quintero	Jan 30 2025	Brittney Tresenrider	Functional	
352201	1-22-00137-Hum	2	Nov 10 2023	Brendan Quintero	Feb 4 2025	Austin Nolan	Functional	
352201	1-22-00137-Hum	3	Nov 10 2023	Brendan Quintero	Feb 4 2025	Austin Nolan	Functional	
362201	1-23-00064 Hum	RP 1	Jan 29 2025	Brittney Tresenrider			Functional	
362201	1-23-00064 Hum	RP 2	Jan 29 2025	Brittney Tresenrider			Functional	
402001	1-21-00017-Hum	22	Aug 22 2022	Travis Wills-Pendley	Nov 15 2023	Perris Alfonzo	Functional	
402001	1-21-00017-Hum	24	Aug 22 2022	Travis Wills-Pendley	Nov 15 2023	Perris Alfonzo	Functional	
402001	1-21-00017-Hum	30	Nov 15 2023	Perris Alfonzo	Aug 14 2024	Haley Weaver	Functional	
402001	1-21-00017-Hum	30	Nov 15 2023	Perris Alfonzo	Aug 14 2024	Haley Weaver	Functional	
402001	1-21-00017-Hum	31	Nov 15 2023	Perris Alfonzo	Aug 14 2024	Haley Weaver	Functional	
402001	1-21-00017-Hum	31	Nov 15 2023	Perris Alfonzo	Aug 14 2024	Haley Weaver	Functional	
402301	1-23-00127 Hum	07	Jan 14 2025	Austin Nolan			Functional	
402301	1-23-00127 Hum	08	Jan 14 2025	Austin Nolan			Functional	
402301	1-23-00127 Hum	09	Jan 14 2025	Austin Nolan			Functional	
422001	1-20-00067 Hum	1	Oct 7 2022	Haley Weaver	Oct 24 2023	Others	Functional	
422001	1-20-00067 Hum	2	Oct 7 2022	Haley Weaver	Oct 24 2023	Others	Functional	
422002	1-21-00091-Hum	09	Oct 7 2022	Haley Weaver	Oct 24 2023	Others	Functional	
422002	1-21-00091-Hum	10	Oct 7 2022	Haley Weaver	Oct 24 2023	Others	Functional	
422002	1-21-00091-Hum	11	Oct 7 2022	Haley Weaver	Oct 24 2023	Others	Functional	
422002	1-21-00091-Hum	12	Oct 7 2022	Haley Weaver	Oct 24 2023	Others	Functional	
422002	1-21-00091-Hum	13	Oct 7 2022	Haley Weaver	Oct 24 2023	Others	Functional	
422002	1-21-00091-Hum	14	Sep 12 2022	Others	Oct 25 2023	Others	Functional	
422002	1-21-00091-Hum	15	Sep 12 2022	Others	Oct 25 2023	Others	Functional	
422002	1-21-00091-Hum	16	Sep 12 2022	Others	Oct 25 2023	Others	Functional	
422002	1-21-00091-Hum	17	Sep 12 2022	Others	Oct 25 2023	Others	Functional	
422002	1-21-00091-Hum	19	Sep 12 2022	Others	Oct 25 2023	Others	Functional	
422002	1-21-00091-Hum	20	Sep 12 2022	Others	Oct 25 2023	Others	Functional	
422002	1-21-00091-Hum	WQ.1	Oct 7 2022	Haley Weaver	Oct 24 2023	Others	Functional	
422201	1-23-00055 Hum	Fawn Prairie NOD	Jan 14 2025	Austin Nolan			Functional	
431901	1-19-00167-HUM	04	Jan 21 2025	Austin Nolan			Functional	
431901	1-19-00167-HUM	05	Jan 21 2025	Austin Nolan			Functional	

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431901	1-19-00167-HUM	06	Jan 21 2025	Austin Nolan			Functional	
432201	1-23-00004-Hum	03	Aug 31 2023	Haley Weaver	Jun 6 2024	Haley Weaver	Functional	
432201	1-23-00004-Hum	04	Aug 30 2023	Haley Weaver	Jun 6 2024	Haley Weaver	Functional	
432201	1-23-00004-Hum	05	Aug 31 2023	Haley Weaver	Jul 15 2024	Haley Weaver	Functional	
432203	1-23-00001-Hum	2	Oct 10 2023	Lillian Judevine	Aug 28 2024	Haley Weaver	Functional	
432204	1-23-00016-Hum	01	Oct 25 2023	Others	Jul 29 2024	Haley Weaver	Functional	
432204	1-23-00016-Hum	02	Oct 25 2023	Others	Jul 29 2024	Haley Weaver	Functional	
432204	1-23-00016-Hum	03	Oct 25 2023	Others	Jul 29 2024	Haley Weaver	Functional	
432204	1-23-00016-Hum	04	Oct 25 2023	Others	Jul 29 2024	Haley Weaver	Functional	
441802	1-19-00068-HUM	02	Mar 25 2024	Brendan Quintero	Jun 30 2021	Others	Functional	
441802	1-19-00068-HUM	03	Mar 25 2024	Brendan Quintero	Jun 30 2021	Others	Functional	
442301	1-24-00024 Hum	12	Jan 14 2025	Austin Nolan			Functional	
452001	1-20-00162-HUM	01	Jan 14 2025	Austin Nolan			Functional	
452001	1-20-00162-HUM	04	Jul 15 2024	Haley Weaver			Functional	
452001	1-20-00162-HUM	05	Oct 3 2024	Haley Weaver			Functional	
452001	1-20-00162-HUM	06	Oct 2 2024	Haley Weaver			Functional	
452001	1-20-00162-HUM	07	Oct 2 2024	Haley Weaver			Functional	
452101	1-22-00112-Hum	01	Oct 23 2023	Others	Jun 6 2024	Haley Weaver	Functional	
452301	1-23-00146 Hum	1	Oct 16 2024	Haley Weaver			Functional	
471022	1-10-108HUM	06	Oct 3 2012	RPF - B Dobosh	Oct 18 2023	Haley Weaver	Functional	
471802	1-18-00140 HUM	04	Sep 27 2022	Others	Oct 18 2023	Haley Weaver	Functional	
471802	1-18-00140 HUM	05	Sep 27 2022	Others	Oct 18 2023	Haley Weaver	Functional	
471802	1-18-00140 HUM	06	Sep 27 2022	Others	Oct 18 2023	Haley Weaver	Functional	
472004	1-21-00099-Hum	01	Dec 13 2022	Lillian Judevine	Nov 6 2023	Perris Alfonzo	Functional	
472004	1-21-00099-Hum	08	Sep 27 2022	Others	Oct 18 2023	Haley Weaver	Functional	
472004	1-21-00099-Hum	10	Oct 19 2022	Others	Oct 18 2023	Haley Weaver	Functional	
472101	1-21-00147-Hum	1	Jul 28 2022	Others	Oct 17 2023	Haley Weaver	Functional	
472101	1-21-00147-Hum	1.5	Jul 28 2022	Others	Oct 17 2023	Haley Weaver	Functional	
472101	1-21-00147-Hum	2	Jul 28 2022	Others	Oct 17 2023	Haley Weaver	Functional	
472101	1-21-00147-Hum	4	Sep 27 2022	Others	Oct 17 2023	Haley Weaver	Functional	
472101	1-21-00147-Hum	9	Oct 19 2023	Others	Jun 12 2024	Haley Weaver	Functional	
472104	1-21-00120-Hum	08	Sep 27 2022	Others	Nov 6 2023	Perris Alfonzo	Functional	
472106	1-22-00037-Hum	TC-1	Oct 19 2023	Others	Jun 6 2024	Haley Weaver	Functional	
472203	1-23-00068-Hum	01	Aug 5 2024	Haley Weaver			Functional	
472203	1-23-00068-Hum	02	Aug 5 2024	Haley Weaver			Functional	
472203	1-23-00068-Hum	03	Aug 5 2024	Haley Weaver			Functional	
472301	1-23-00102 Hum	01	Oct 29 2024	Haley Weaver			Functional	
472301	1-23-00102 Hum	02	Oct 16 2024	Haley Weaver			Functional	
472303	1-23-00124 Hum	05	Oct 16 2024	Haley Weaver			Functional	
472304	1-23-00173 Hum	2	Oct 16 2024	Haley Weaver			Functional	
472304	1-23-00173 Hum	3	Oct 16 2024	Haley Weaver			Functional	
472304	1-23-00173 Hum	4	Oct 16 2024	Haley Weaver			Functional	
472304	1-23-00173 Hum	5	Oct 16 2024	Haley Weaver			Functional	
472304	1-23-00173 Hum	6	Oct 29 2024	Haley Weaver			Functional	
472304	1-23-00173 Hum	7	Oct 29 2024	Haley Weaver			Functional	
472304	1-23-00173 Hum	8	Oct 29 2024	Haley Weaver			Functional	
482101	1-22-00013-Hum	01	Oct 11 2022	Haley Weaver	Oct 26 2023	Others	Functional	
482101	1-22-00013-Hum	02	Oct 11 2022	Haley Weaver	Oct 26 2023	Others	Functional	
482101	1-22-00013-Hum	03	Oct 11 2022	Haley Weaver	Oct 26 2023	Others	Functional	
482101	1-22-00013-Hum	04	Oct 11 2022	Haley Weaver	Oct 26 2023	Others	Functional	
482101	1-22-00013-Hum	07	Oct 11 2022	Haley Weaver	Oct 23 2023	Others	Functional	
482101	1-22-00013-Hum	11	Oct 11 2022	Haley Weaver	Oct 24 2023	Others	Functional	
482101	1-22-00013-Hum	12	Oct 11 2022	Haley Weaver	Oct 24 2023	Others	Functional	
482101	1-22-00013-Hum	13	Oct 11 2022	Haley Weaver	Oct 24 2023	Others	Functional	
482101	1-22-00013-Hum	19	Dec 2 2022	Others	Nov 15 2023	Perris Alfonzo	Functional	
482101	1-22-00013-Hum	20	Dec 2 2022	Others	Aug 31 2023	Haley Weaver	Functional	
482101	1-22-00013-Hum	21	Dec 2 2022	Others	Aug 31 2023	Haley Weaver	Functional	

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482101	1-22-00013-Hum	22	Dec 2 2022	Others	Aug 31 2023	Haley Weaver	Functional	
482101	1-22-00013-Hum	24	Dec 2 2022	Others	Aug 31 2023	Haley Weaver	Functional	
482102	1-22-00018-Hum	2	Sep 9 2022	Lillian Judevine	Oct 23 2023	Others	Functional	
482201	1-23-00089 Hum	05	Aug 8 2024	Haley Weaver			Functional	
482201	1-23-00089 Hum	05.1	Aug 14 2024	Haley Weaver			Functional	
482201	1-23-00089 Hum	06	Aug 14 2024	Haley Weaver			Functional	
511801	1-18-092 HUM	01	Sep 19 2022	Others	Sep 6 2023	Others	Functional	
511801	1-18-092 HUM	02	Sep 19 2022	Others	Sep 6 2023	Others	Functional	
511801	1-18-092 HUM	03	Sep 19 2022	Others	Sep 6 2023	Others	Functional	
511801	1-18-092 HUM	04	Sep 19 2022	Others	Oct 30 2023	Others	Functional	
511801	1-18-092 HUM	05	Sep 19 2022	Others	Oct 30 2023	Others	Functional	
511801	1-18-092 HUM	06	Sep 19 2022	Others	Oct 30 2023	Others	Functional	
511801	1-18-092 HUM	07	Sep 19 2022	Others	Oct 30 2023	Others	Functional	
511801	1-18-092 HUM	08	Sep 19 2022	Others	Oct 30 2023	Others	Functional	
511801	1-18-092 HUM	09	Sep 8 2022	Haley Weaver	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	10	Sep 8 2022	Haley Weaver	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	11	Sep 8 2022	Haley Weaver	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	12	Sep 8 2022	Haley Weaver	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	13	Sep 8 2022	Haley Weaver	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	14	Sep 15 2022	Others	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	17	Sep 15 2022	Others	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	18	Sep 15 2022	Others	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	20	Sep 8 2022	Haley Weaver	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	21	Sep 8 2022	Haley Weaver	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	22	Sep 8 2022	Haley Weaver	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	23	Sep 8 2022	Haley Weaver	Sep 7 2023	Haley Weaver	Functional	
511801	1-18-092 HUM	24	Sep 8 2022	Haley Weaver	Sep 7 2023	Haley Weaver	Functional	
512102	1-22-00026-Hum	03	Sep 6 2023	Others	Jan 23 2025	Brittney Tresenrider	Functional	
512102	1-22-00026-Hum	4	Sep 6 2023	Others	Mar 4 2025	Brittney Tresenrider	Unk	Needs supervisor review, scheduled for Winter 2025.
512102	1-22-00026-Hum	05	Sep 6 2023	Others	Jan 23 2025	Brittney Tresenrider	Functional	
512102	1-22-00026-Hum	06	Sep 6 2023	Others	Jan 23 2025	Brittney Tresenrider	Functional	
512102	1-22-00026-Hum	07	Sep 6 2023	Others	Jan 23 2025	Brittney Tresenrider	Functional	
512102	1-22-00026-Hum	08	Sep 6 2023	Others	Jan 23 2025	Brittney Tresenrider	Functional	
512102	1-22-00026-Hum	09	Sep 6 2023	Others	Jan 23 2025	Brittney Tresenrider	Functional	
512102	1-22-00026-Hum	10	Oct 10 2023	Others	Jan 23 2025	Brittney Tresenrider	Functional	
512102	1-22-00026-Hum	14	Sep 16 2022	Others	Oct 10 2023	Others	Functional	
512102	1-22-00026-Hum	17	Oct 10 2023	Others	Jan 23 2025	Brittney Tresenrider	Functional	
512102	1-22-00026-Hum	20	Oct 30 2023	Others	Jan 23 2025	Brittney Tresenrider	Functional	
512102	1-22-00026-Hum	21	Oct 30 2023	Others	Jan 23 2025	Brittney Tresenrider	Functional	
512102	1-22-00026-Hum	22	Oct 30 2023	Others	Jan 23 2025	Brittney Tresenrider	Functional	
512102	1-22-00026-Hum	23	Jan 13 2025	Austin Nolan			Functional	
512102	1-22-00026-Hum	24	Dec 12 2024	Austin Nolan			Functional	
512103	1-23-00020-Hum	2	Dec 5 2024	Perris Alfonzo			Functional	
512103	1-23-00020-Hum	9	Dec 5 2024	Perris Alfonzo			Functional	
512201	1-23-00182 Hum	01	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	02	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	03	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	04	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	05	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	06	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	07	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	08	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	09	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	10	Jan 13 2025	Austin Nolan			Functional	
512201	1-23-00182 Hum	11	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	12	Nov 7 2024	Others			Functional	

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512201	1-23-00182 Hum	13	Nov 7 2024	Others			Functional	
512201	1-23-00182 Hum	15	Nov 7 2024	Others			Functional	
512201	1-23-00182 Hum	16	Nov 7 2024	Others			Functional	
512201	1-23-00182 Hum	17	Nov 7 2024	Others			Functional	
512201	1-23-00182 Hum	18	Nov 7 2024	Others			Functional	
512201	1-23-00182 Hum	19	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	20	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	21	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	22	Oct 23 2024	Others			Functional	
512201	1-23-00182 Hum	24	Oct 23 2024	Others			Functional	
561704	1-18-063HUM	01	Nov 5 2024	Others			Functional	
561704	1-18-063HUM	09	Nov 5 2024	Others			Functional	
561704	1-18-063HUM	10	Nov 5 2024	Others			Functional	
561803	1-18-00141HUM	02	Sep 16 2022	Others	Aug 30 2023	Haley Weaver	Functional	
561803	1-18-00141HUM	03	Sep 16 2022	Others	Aug 30 2023	Haley Weaver	Functional	
561903	1-21-00001-Hum	02	Nov 5 2024	Others			Functional	
561903	1-21-00001-Hum	03	Jan 9 2025	Perris Alfonzo			Functional	
561903	1-21-00001-Hum	04	Nov 5 2024	Others			Functional	
561903	1-21-00001-Hum	05	Nov 5 2024	Others			Functional	
561903	1-21-00001-Hum	06	Nov 5 2024	Others			Functional	
561903	1-21-00001-Hum	07	Oct 31 2023	Others	Jan 9 2025	Perris Alfonzo	Functional	
561903	1-21-00001-Hum	10	Nov 5 2024	Others			Functional	
561904	1-20-00149-HUM	11	Oct 31 2023	Others	Jul 23 2024	Perris Alfonzo	Functional	
562001	1-21-00023-Hum	12	Sep 27 2022	Others	Oct 30 2023	Others	Functional	
562001	1-21-00023-Hum	13	Oct 18 2022	Haley Weaver	Oct 30 2023	Others	Functional	
562002	1-20-00213-Hum	01	Sep 15 2022	Others	Aug 30 2023	Haley Weaver	Functional	
562002	1-20-00213-Hum	02	Sep 15 2022	Others	Aug 30 2023	Haley Weaver	Functional	
562002	1-20-00213-Hum	03	Sep 15 2022	Others	Aug 30 2023	Haley Weaver	Functional	
562002	1-20-00213-Hum	04	Sep 15 2022	Others	Aug 30 2023	Haley Weaver	Functional	
562002	1-20-00213-Hum	05	Sep 29 2022	Others	Aug 30 2023	Haley Weaver	Functional	
562002	1-20-00213-Hum	06	Sep 16 2022	Others	Aug 30 2023	Haley Weaver	Functional	
562002	1-20-00213-Hum	14	Sep 15 2022	Others	Oct 31 2023	Others	Functional	
562002	1-20-00213-Hum	15	Sep 15 2022	Others	Oct 31 2023	Others	Functional	
562002	1-20-00213-Hum	16	Sep 15 2022	Others	Aug 30 2023	Haley Weaver	Functional	
562101	1-21-00087-Hum	18	Oct 10 2023	Others	Jan 9 2025	Perris Alfonzo	Functional	
562102	1-21-00168-Hum	100	Oct 30 2023	Others	Jul 23 2024	Perris Alfonzo	Functional	
562102	1-21-00168-Hum	101	Oct 30 2023	Others	Jul 23 2024	Perris Alfonzo	Functional	
562103	1-23-00074-Hum	02	Jan 9 2025	Perris Alfonzo			Functional	
562103	1-23-00074-Hum	03	Jan 9 2025	Perris Alfonzo			Functional	
562103	1-23-00074-Hum	04	Jan 9 2025	Perris Alfonzo			Functional	
562103	1-23-00074-Hum	05	Jan 9 2025	Perris Alfonzo			Functional	
562103	1-23-00074-Hum	06	Jan 9 2025	Perris Alfonzo			Functional	
562103	1-23-00074-Hum	07	Jan 9 2025	Perris Alfonzo			Functional	
562103	1-23-00074-Hum	10	Jan 9 2025	Perris Alfonzo			Functional	
562201	1-23-00125 Hum	01	Nov 11 2024	Austin Nolan			Functional	
562201	1-23-00125 Hum	07	Nov 11 2024	Austin Nolan			Functional	
562201	1-23-00125 Hum	17	Jul 23 2024	Perris Alfonzo			Functional	
562302	1-23-00123 Hum	06	Oct 28 2024	Haley Weaver			Functional	
562302	1-23-00123 Hum	07	Oct 28 2024	Haley Weaver			Functional	
562302	1-23-00123 Hum	08	Oct 28 2024	Haley Weaver			Functional	
562302	1-23-00123 Hum	09	Oct 30 2024	Haley Weaver			Functional	
562302	1-23-00123 Hum	10	Oct 28 2024	Haley Weaver			Functional	
562303	1-23-00092 Hum	01	Oct 30 2024	Haley Weaver			Functional	
562304	1-23-00185 Hum	01	Oct 28 2024	Haley Weaver			Functional	
562304	1-23-00185 Hum	02	Oct 28 2024	Haley Weaver			Functional	

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562304	1-23-00185 Hum	03	Jul 23 2024	Perris Alfonzo			Functional	
562304	1-23-00185 Hum	04	Jul 23 2024	Perris Alfonzo			Functional	
562304	1-23-00185 Hum	05	Oct 28 2024	Haley Weaver			Functional	
562304	1-23-00185 Hum	06	Oct 28 2024	Haley Weaver			Functional	
562304	1-23-00185 Hum	07	Oct 28 2024	Haley Weaver			Functional	
562304	1-23-00185 Hum	08	Oct 28 2024	Haley Weaver			Functional	
562304	1-23-00185 Hum	100	Oct 28 2024	Haley Weaver			Functional	
562401	1-24-00081 Hum	3	Jan 13 2025	Austin Nolan			Functional	
562401	1-24-00081 Hum	4	Jan 13 2025	Austin Nolan			Functional	
562401	1-24-00081 Hum	5	Jan 13 2025	Austin Nolan			Functional	
562401	1-24-00081 Hum	6	Jan 13 2025	Austin Nolan			Functional	
562401	1-24-00081 Hum	7	Jan 13 2025	Austin Nolan			Functional	
562401	1-24-00081 Hum	8	Jan 13 2025	Austin Nolan			Functional	
562401	1-24-00081 Hum	9	Jan 13 2025	Austin Nolan			Functional	
611901	1-20-00177-Hum	10	Sep 26 2022	Others	Sep 13 2023	Others	Functional	
611901	1-20-00177-Hum	CSDS 1	Sep 26 2022	Others	Sep 13 2023	Others	Functional	
612201	1-22-00158-Hum	02	Aug 27 2024	Haley Weaver			Functional	
612201	1-22-00158-Hum	08	Nov 12 2024	Austin Nolan			Functional	
612201	1-22-00158-Hum	09	Nov 1 2023	Others	Jan 29 2025	Perris Alfonzo	Functional	
612201	1-22-00158-Hum	10	Nov 1 2023	Others	Jan 29 2025	Perris Alfonzo	Functional	
612201	1-22-00158-Hum	11	Nov 1 2023	Others	Jan 29 2025	Perris Alfonzo	Functional	
612201	1-22-00158-Hum	12	Nov 1 2023	Others	Jan 29 2025	Perris Alfonzo	Functional	
612201	1-22-00158-Hum	13	Nov 1 2023	Others	Jan 29 2025	Perris Alfonzo	Functional	
612201	1-22-00158-Hum	14	Nov 1 2023	Others	Jan 29 2025	Perris Alfonzo	Functional	
612201	1-22-00158-Hum	15	Nov 1 2023	Others	Jan 29 2025	Perris Alfonzo	Functional	
612201	1-22-00158-Hum	101	Sep 13 2023	Others	Aug 27 2024	Haley Weaver	Functional	
612201	1-22-00158-Hum	102	Sep 13 2023	Others	Aug 27 2024	Haley Weaver	Functional	
612201	1-22-00158-Hum	103	Sep 13 2023	Others	Aug 27 2024	Haley Weaver	Functional	
612201	1-22-00158-Hum	104	Sep 27 2023	Haley Weaver	Aug 27 2024	Haley Weaver	Functional	
612201	1-22-00158-Hum	105	Sep 27 2023	Haley Weaver	Aug 27 2024	Haley Weaver	Functional	
612201	1-22-00158-Hum	106	Sep 13 2023	Others	Aug 27 2024	Haley Weaver	Functional	
662101	1-23-00008-Del	01	Sep 27 2023	Haley Weaver	Jul 18 2024	Haley Weaver	Functional	
662101	1-23-00008-Del	2.1	Sep 27 2023	Haley Weaver	Jul 18 2024	Haley Weaver	Functional	
662101	1-23-00008-Del	04	Sep 27 2023	Haley Weaver	Jul 18 2024	Haley Weaver	Functional	
662101	1-23-00008-Del	05	Sep 27 2023	Haley Weaver	Jul 18 2024	Haley Weaver	Functional	
662101	1-23-00008-Del	06	Jul 25 2024	Haley Weaver			Functional	
662101	1-23-00008-Del	07	Sep 27 2023	Haley Weaver	Jul 18 2024	Haley Weaver	Functional	
662101	1-23-00008-Del	08	Sep 27 2023	Haley Weaver	Jul 18 2024	Haley Weaver	Functional	
662101	1-23-00008-Del	8.1	Oct 2 2023	Haley Weaver	Jul 25 2024	Haley Weaver	Functional	
662201	1-23-00091 Del	01	Oct 31 2024	Others			Functional	
662201	1-23-00091 Del	02	Oct 30 2024	Others			Functional	
662201	1-23-00091 Del	03	Oct 31 2024	Others			Functional	
672001	1-21-00089-Hum	RP-01	Dec 1 2022	Others	Nov 1 2023	Others	Functional	
672001	1-21-00089-Hum	RP-17	Nov 12 2024	Austin Nolan			Functional	
672001	1-21-00089-Hum	RP-18	Sep 29 2022	Others	Nov 20 2023	Perris Alfonzo	Functional	
672001	1-21-00089-Hum	RP-19	Sep 29 2022	Others	Nov 20 2023	Perris Alfonzo	Functional	
702001	1-21-00005-Del	11	Jan 14 2025	Brittney Tresenrider			Functional	
702001	1-21-00005-Del	12	Jan 14 2025	Brittney Tresenrider			Functional	
702001	1-21-00005-Del	13	Jan 14 2025	Brittney Tresenrider			Functional	
702001	1-21-00005-Del	14	Jan 14 2025	Brittney Tresenrider			Functional	
711702	1-17-073	18	Dec 7 2022	Haley Weaver	Nov 14 2023	Brendan Quintero	Functional	
711801	1-18-098 DEL	01	Dec 1 2022	Others	Nov 15 2023	Brendan Quintero	Functional	
711804	1-19-00120DEL	01	Dec 1 2022	Others	Oct 10 2023	Haley Weaver	Functional	
711804	1-19-00120DEL	02	Dec 1 2022	Others	Oct 10 2023	Haley Weaver	Functional	
711804	1-19-00120DEL	14	Dec 1 2022	Others	Nov 15 2023	Brendan Quintero	Functional	

GDRCO #	State #	Road Point	Pre-Winter Inspection Date	RPF Pre-Inspection	Post-winter Inspection Date	RPF Post-Inspection	Functional Status	Notes
711804	1-19-00120DEL	17	Dec 1 2022	Others	Nov 15 2023	Brendan Quintero	Functional	
712103	1-21-00189-Del	02	Nov 30 2022	Others	Oct 10 2023	Haley Weaver	Functional	
712103	1-21-00189-Del	03	Nov 30 2022	Others	Oct 24 2023	Haley Weaver	Functional	
712103	1-21-00189-Del	06	Nov 30 2022	Others	Oct 10 2023	Haley Weaver	Functional	
712103	1-21-00189-Del	07	Nov 30 2022	Others	Oct 10 2023	Haley Weaver	Functional	
712103	1-21-00189-Del	101	Nov 30 2022	Others	Oct 24 2023	Haley Weaver	Functional	
712103	1-21-00189-Del	102	Dec 1 2022	Others	Oct 10 2023	Haley Weaver	Functional	
712103	1-21-00189-Del	103	Dec 1 2022	Others	Oct 10 2023	Haley Weaver	Functional	
712103	1-21-00189-Del	104	Dec 1 2022	Others	Oct 24 2023	Haley Weaver	Functional	
712104	1-22-00107 Del	02	Oct 10 2023	Haley Weaver	Aug 8 2024	Perris Alfonzo	Functional	
712105	1-22-00167-Del	10	Nov 11 2024	Haley Weaver			Functional	
712105	1-22-00167-Del	11	Nov 11 2024	Haley Weaver			Functional	
712105	1-22-00167-Del	16	Oct 10 2023	Haley Weaver	Aug 8 2024	Perris Alfonzo	Functional	
712202	1-24-00072 Del	02	Jan 14 2025	Brittney Tresenrider			Functional	
712202	1-24-00072 Del	07	Nov 11 2024	Haley Weaver			Functional	
712202	1-24-00072 Del	14	Nov 11 2024	Haley Weaver			Functional	
712202	1-24-00072 Del	16	Nov 14 2024	Haley Weaver			Functional	
712302	1-24-00045 Del	02	Nov 14 2024	Haley Weaver			Functional	
732101	1-21-00192-Del	01	Oct 25 2023	Haley Weaver	Aug 7 2024	Perris Alfonzo	Functional	
732101	1-21-00192-Del	03	Oct 25 2023	Haley Weaver	Aug 7 2024	Perris Alfonzo	Functional	
732101	1-21-00192-Del	04	Oct 25 2023	Haley Weaver	Aug 7 2024	Perris Alfonzo	Functional	
732102	1-21-00195-Del	02	Dec 1 2022	Others	Oct 25 2023	Haley Weaver	Functional	
732102	1-21-00195-Del	03	Nov 11 2024	Haley Weaver			Functional	
732102	1-21-00195-Del	04	Dec 1 2022	Others	Oct 25 2023	Haley Weaver	Functional	
732102	1-21-00195-Del	100	Dec 1 2022	Others	Oct 25 2023	Haley Weaver	Functional	
732102	1-21-00195-Del	101	Dec 1 2022	Others	Oct 25 2023	Haley Weaver	Functional	
732102	1-21-00195-Del	102	Dec 1 2022	Others	Oct 25 2023	Haley Weaver	Functional	
851901	1-20-00008 Del	09	Jul 30 2024	Perris Alfonzo			Functional	
851901	1-20-00008 Del	10	Jul 30 2024	Perris Alfonzo			Functional	
851901	1-20-00008 Del	20	Oct 25 2023	Haley Weaver	Jul 30 2024	Perris Alfonzo	Functional	
851901	1-20-00008 Del	21	Oct 25 2023	Haley Weaver	Jul 30 2024	Perris Alfonzo	Functional	
851901	1-20-00008 Del	22	Oct 25 2023	Haley Weaver	Jul 30 2024	Perris Alfonzo	Functional	
851901	1-20-00008 Del	23	Oct 25 2023	Haley Weaver	Jul 30 2024	Perris Alfonzo	Functional	
852002	1-21-00146-Del	01	Sep 20 2022	Others	Oct 25 2023	Haley Weaver	Functional	
852002	1-21-00146-Del	02	Nov 30 2022	Others	Oct 25 2023	Haley Weaver	Functional	
852002	1-21-00146-Del	03	Dec 1 2022	Others	Oct 25 2023	Haley Weaver	Functional	
852002	1-21-00146-Del	06	Nov 30 2022	Others	Nov 13 2023	Brendan Quintero	Functional	
852002	1-21-00146-Del	07	Sep 22 2022	Others	Nov 13 2023	Brendan Quintero	Functional	
852002	1-21-00146-Del	09	Sep 9 2022	Others	Oct 25 2023	Haley Weaver	Functional	
852002	1-21-00146-Del	10	Sep 20 2022	Others	Oct 25 2023	Haley Weaver	Functional	
852002	1-21-00146-Del	11	Jul 30 2024	Perris Alfonzo			Functional	
852002	1-21-00146-Del	12	Jul 30 2024	Perris Alfonzo			Functional	
852002	1-21-00146-Del	CSDS_03	Jul 30 2024	Perris Alfonzo			Functional	
852201	1-23-00002-Del	02	Oct 25 2023	Haley Weaver	Jul 30 2024	Perris Alfonzo	Functional	
852201	1-23-00002-Del	101	Oct 25 2023	Haley Weaver	Jul 30 2024	Perris Alfonzo	Functional	
901901	1-19-00212DEL	1	Sep 20 2022	Haley Weaver	Nov 14 2023	Brendan Quintero	Functional	
901901	1-19-00212DEL	5	Sep 20 2022	Haley Weaver	Nov 14 2023	Brendan Quintero	Functional	
902101	1-21-00102-Del	2	Sep 20 2022	Haley Weaver	Nov 14 2023	Brendan Quintero	Functional	
902101	1-21-00102-Del	3	Sep 20 2022	Haley Weaver	Nov 14 2023	Brendan Quintero	Functional	
902101	1-21-00102-Del	4	Sep 20 2022	Haley Weaver	Nov 14 2023	Brendan Quintero	Functional	
902401	1-24-00066 Del	01	Jan 8 2025	Brittney Tresenrider			Functional	
902401	1-24-00066 Del	04	Jan 8 2025	Brittney Tresenrider			Functional	
931702	1-18-106 DEL	09	Dec 1 2022	Others	Oct 24 2023	Haley Weaver	Functional	
931801	1-18-00195-DEL	02	Nov 1 2023	Others	Aug 6 2024	Haley Weaver	Functional	
931801	1-18-00195-DEL	03	Nov 1 2023	Others	Aug 6 2024	Haley Weaver	Functional	
931801	1-18-00195-DEL	04	Nov 1 2023	Others	Aug 6 2024	Haley Weaver	Functional	

GDRCO #	State #	Road Point	Pre-Winter Inspection Date	RPF Pre-Inspection	Post-winter Inspection Date	RPF Post-Inspection	Functional Status	Notes
931801	1-18-00195-DEL	05	Nov 1 2023	Others	Aug 6 2024	Haley Weaver	Functional	
931801	1-18-00195-DEL	21	Oct 24 2023	Haley Weaver	Jan 28 2025	Brittney Tresenrider	Functional	
931801	1-18-00195-DEL	22	Oct 24 2023	Haley Weaver	Jan 28 2025	Brittney Tresenrider	Functional	
931801	1-18-00195-DEL	23	Oct 24 2023	Haley Weaver	Jan 28 2025	Brittney Tresenrider	Functional	
931802	1-18-00187-DEL	08	Oct 20 2022	Haley Weaver	Oct 26 2023	Haley Weaver	Functional	
932001	1-20-00142-Del	4	Jan 2 2025	Brittney Tresenrider			Functional	
932101	1-21-00141-Del	01	Sep 28 2023	Others	Jun 26 2024	RPF	Functional	
932101	1-21-00141-Del	02	Sep 28 2023	Others	Jun 26 2024	RPF	Post non-compliant	partially failed and caused some downcutting. Scheduled to be fixed summer 2024.
932101	1-21-00141-Del	03	Sep 28 2023	Others	Jun 26 2024	RPF	Functional	
932101	1-21-00141-Del	04	Sep 28 2023	Others	Jun 26 2024	RPF	Functional	
932101	1-21-00141-Del	07	Sep 28 2023	Others	Aug 15 2024	Haley Weaver	Functional	
932101	1-21-00141-Del	08	Sep 28 2023	Others	Aug 15 2024	Haley Weaver	Functional	
932101	1-21-00141-Del	09	Sep 28 2023	Others	Aug 15 2024	Haley Weaver	Functional	
932101	1-21-00141-Del	10	Sep 28 2023	Others	Aug 15 2024	Haley Weaver	Functional	
932102	1-21-00165-Del	02	Nov 2 2023	Others	Jul 11 2024	Haley Weaver	Functional	
932102	1-21-00165-Del	05	Dec 6 2022	Haley Weaver	Nov 2 2023	Others	Functional	
932102	1-21-00165-Del	06	Nov 2 2023	Others	Jul 29 2024	Haley Weaver	Functional	
932102	1-21-00165-Del	07	Nov 2 2023	Others	Jun 20 2024	Haley Weaver	Functional	
932102	1-21-00165-Del	08	Dec 5 2022	Others	Nov 2 2023	Others	Functional	
932102	1-21-00165-Del	09	Dec 5 2022	Others	Nov 2 2023	Others	Functional	
932102	1-21-00165-Del	10	Dec 6 2022	Haley Weaver	Nov 2 2023	Others	Functional	
932102	1-21-00165-Del	11	Dec 6 2022	Haley Weaver	Nov 2 2023	Others	Functional	
932102	1-21-00165-Del	12	Dec 1 2022	Others	Oct 24 2023	Haley Weaver	Functional	
932102	1-21-00165-Del	13	Dec 1 2022	Others	Oct 24 2023	Haley Weaver	Functional	
932102	1-21-00165-Del	14	Dec 1 2022	Others	Oct 24 2023	Haley Weaver	Functional	
932102	1-21-00165-Del	17	Dec 1 2022	Others	Oct 24 2023	Haley Weaver	Functional	
932102	1-21-00165-Del	18	Dec 1 2022	Others	Oct 24 2023	Haley Weaver	Functional	
932102	1-21-00165-Del	19	Dec 1 2022	Others	Nov 1 2023	Others	Functional	
932103	1-22-00066-Del	01	Sep 28 2023	Others	Aug 8 2024	Haley Weaver	Functional	
932103	1-22-00066-Del	02	Sep 28 2023	Others	Aug 8 2024	Haley Weaver	Functional	
932103	1-22-00066-Del	03	Sep 28 2023	Others	Aug 8 2024	Haley Weaver	Functional	
932103	1-22-00066-Del	08	Oct 26 2023	Haley Weaver	Jun 27 2024	Haley Weaver	Functional	
932103	1-22-00066-Del	09	Oct 26 2023	Haley Weaver	Jun 27 2024	Haley Weaver	Functional	
932103	1-22-00066-Del	11	Sep 21 2023	Haley Weaver	Jun 27 2024	Haley Weaver	Functional	
932103	1-22-00066-Del	22	Oct 26 2023	Haley Weaver	Jul 18 2024	Haley Weaver	Functional	
932103	1-22-00066-Del	23	Oct 26 2023	Haley Weaver	Jul 18 2024	Haley Weaver	Functional	
932103	1-22-00066-Del	24	Oct 26 2023	Haley Weaver	Jul 18 2024	Haley Weaver	Functional	
932103	1-22-00066-Del	25	Oct 26 2023	Haley Weaver	Jul 18 2024	Haley Weaver	Functional	
932103	1-22-00066-Del	26	Oct 26 2023	Haley Weaver	Jul 18 2024	Haley Weaver	Functional	
932103	1-22-00066-Del	27	Jun 27 2024	Haley Weaver	Jan 28 2025	Brittney Tresenrider	Functional	
932104	1-22-00145 Del	02	Aug 15 2024	Haley Weaver			Functional	
932104	1-22-00145 Del	03	Aug 15 2024	Haley Weaver			Functional	
932104	1-22-00145 Del	04	Aug 15 2024	Haley Weaver			Functional	
932104	1-22-00145 Del	05	Aug 15 2024	Haley Weaver			Functional	
932104	1-22-00145 Del	06	Aug 15 2024	Haley Weaver			Functional	
932104	1-22-00145 Del	07	Aug 15 2024	Haley Weaver			Functional	
932104	1-22-00145 Del	12	Oct 5 2023	Haley Weaver	Jun 20 2024	Haley Weaver	Functional	
932104	1-22-00145 Del	12	Oct 5 2023	Haley Weaver	Jun 20 2024	Haley Weaver	Functional	
932104	1-22-00145 Del	14	Jan 7 2025	Brittney Tresenrider			Functional	
932201	1-23-00015-Del	1	Nov 2 2023	Others	Jul 11 2024	Haley Weaver	Functional	
932202	1-23-00081 Del	01	Jan 2 2025	Brittney Tresenrider			Functional	
932202	1-23-00081 Del	01.1	Jan 2 2025	Brittney Tresenrider			Functional	
932202	1-23-00081 Del	02	Jan 8 2025	Brittney Tresenrider			Functional	
932202	1-23-00081 Del	03	Jan 8 2025	Brittney Tresenrider			Functional	
932202	1-23-00081 Del	04	Jan 8 2025	Brittney Tresenrider			Functional	

GDRCO #	State #	Road Point	Pre-Winter Inspection Date	RPF Pre-Inspection	Post-winter Inspection Date	RPF Post-Inspection	Functional Status	Notes
932202	1-23-00081 Del	05	Jan 8 2025	Brittney Tresenrider			Functional	
932203	1-23-00035 Del	02	Nov 2 2023	Others	Jun 20 2024	Haley Weaver	Post non-compliant	No notes- supervisor inspection needed.
932203	1-23-00035 Del	03	Nov 2 2023	Others	Jun 20 2024	Haley Weaver	Functional	
932203	1-23-00035 Del	05	Jan 8 2025	Brittney Tresenrider			Functional	
932203	1-23-00035 Del	06	Nov 12 2024	Haley Weaver			Functional	
932203	1-23-00035 Del	07	Nov 12 2024	Haley Weaver			Functional	
932203	1-23-00035 Del	08	Nov 12 2024	Haley Weaver			Functional	
932203	1-23-00035 Del	09	Dec 10 2024	Brittney Tresenrider			Functional	
932203	1-23-00035 Del	10	Sep 2 2024	Haley Weaver			Functional	
932301	1-23-00144 Del	03	Oct 29 2024	Haley Weaver			Functional	
932301	1-23-00144 Del	04	Oct 29 2024	Haley Weaver			Functional	
932301	1-23-00144 Del	05	Oct 29 2024	Haley Weaver			Functional	
932301	1-23-00144 Del	05.1	Oct 29 2024	Haley Weaver			Functional	
932301	1-23-00144 Del	09	Jan 8 2025	Brittney Tresenrider			Functional	
932301	1-23-00144 Del	10	Jan 8 2025	Brittney Tresenrider			Functional	
932301	1-23-00144 Del	11	Jan 8 2025	Brittney Tresenrider			Functional	
932301	1-23-00144 Del	12	Jan 8 2025	Brittney Tresenrider			Pre non-functional	The channel has diverted and water is not conveyed through the culvert.
932301	1-23-00144 Del	13	Jan 8 2025	Brittney Tresenrider			Functional	
932301	1-23-00144 Del	14	Jan 8 2025	Brittney Tresenrider			Functional	
932301	1-23-00144 Del	18	Dec 10 2024	Brittney Tresenrider			Functional	
932301	1-23-00144 Del	21	Oct 29 2024	Haley Weaver			Functional	
932302	1-23-00180 Del	4	Jan 7 2025	Brittney Tresenrider			Functional	
932302	1-23-00180 Del	5	Jan 7 2025	Brittney Tresenrider			Functional	
932302	1-23-00180 Del	6	Jan 7 2025	Brittney Tresenrider			Functional	
942201	1-22-00141-Del	06	Jan 9 2025	Brittney Tresenrider			Functional	
942201	1-22-00141-Del	07	Jan 9 2025	Brittney Tresenrider			Functional	
942201	1-22-00141-Del	08	Jan 9 2025	Brittney Tresenrider			Functional	
942201	1-22-00141-Del	09	Jan 9 2025	Brittney Tresenrider			Functional	
942201	1-22-00141-Del	10	Oct 3 2024	Haley Weaver			Functional	
942201	1-22-00141-Del	11	Jan 9 2025	Brittney Tresenrider			Functional	
942201	1-22-00141-Del	12	Jan 9 2025	Brittney Tresenrider			Functional	
942201	1-22-00141-Del	13	Jan 9 2025	Brittney Tresenrider			Functional	
942201	1-22-00141-Del	14	Jan 9 2025	Brittney Tresenrider			Functional	
942201	1-22-00141-Del	16	Jan 9 2025	Brittney Tresenrider			Pre non-functional	Not excavated to grade
942201	1-22-00141-Del	20	Sep 28 2023	Others	Oct 3 2024	Haley Weaver	Functional	
942201	1-22-00141-Del	21	Oct 3 2024	Haley Weaver			Functional	
942201	1-22-00141-Del	22	Oct 3 2024	Haley Weaver			Functional	
942201	1-22-00141-Del	23	Jan 9 2025	Brittney Tresenrider			Functional	
942201	1-22-00141-Del	24	Sep 28 2023	Others	Oct 3 2024	Haley Weaver	Functional	
942201	1-22-00141-Del	28	Jan 9 2025	Brittney Tresenrider			Functional	
942201	1-22-00141-Del	31	Jan 9 2025	Brittney Tresenrider			Functional	
942301	1-23-00082 Del	01	Sep 5 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	02	Sep 5 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	03	Sep 5 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	05	Sep 5 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	06	Sep 5 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	07	Sep 5 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	08	Sep 5 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	09	Sep 5 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	10	Sep 2 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	11	Sep 5 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	12	Sep 5 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	13	Sep 5 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	14	Nov 11 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	15	Nov 11 2024	Haley Weaver			Functional	

GDRCO #	State #	Road Point	Pre-Winter Inspection Date	RPF Pre-Inspection	Post-winter Inspection Date	RPF Post-Inspection	Functional Status	Notes
942301	1-23-00082 Del	17	Nov 11 2024	Haley Weaver			Functional	
942301	1-23-00082 Del	18	Nov 11 2024	Haley Weaver			Functional	
952101	1-22-00002-Del	2	Sep 21 2022	Haley Weaver	Oct 5 2023	Haley Weaver	Functional	
952101	1-22-00002-Del	5	Sep 21 2022	Haley Weaver	Oct 5 2023	Haley Weaver	Functional	
952101	1-22-00002-Del	6	Sep 21 2022	Haley Weaver	Oct 5 2023	Haley Weaver	Functional	
952101	1-22-00002-Del	100	Sep 21 2022	Haley Weaver	Oct 5 2023	Haley Weaver	Functional	
952101	1-22-00002-Del	101	Sep 21 2022	Haley Weaver	Oct 5 2023	Haley Weaver	Functional	
952101	1-22-00002-Del	102	Sep 21 2022	Haley Weaver	Oct 5 2023	Haley Weaver	Functional	
952101	1-22-00002-Del	103	Sep 21 2022	Haley Weaver	Oct 5 2023	Haley Weaver	Functional	
952101	1-22-00002-Del	104	Sep 21 2022	Haley Weaver	Oct 5 2023	Haley Weaver	Functional	
952101	1-22-00002-Del	105	Sep 21 2022	Haley Weaver	Oct 5 2023	Haley Weaver	Functional	
952201	1-22-00172-Del	1	Nov 14 2023	Haley Weaver	Oct 24 2024	Haley Weaver	Functional	
952201	1-22-00172-Del	01	Nov 14 2023	Haley Weaver	Oct 24 2024	Haley Weaver	Functional	
952201	1-22-00172-Del	03	Oct 24 2024	Haley Weaver			Functional	
952201	1-22-00172-Del	04	Oct 24 2024	Haley Weaver			Functional	
952201	1-22-00172-Del	05	Oct 24 2024	Haley Weaver			Functional	
952201	1-22-00172-Del	06	Oct 24 2024	Haley Weaver			Functional	
952201	1-22-00172-Del	08	Jan 8 2025	Brittney Tresenrider			Functional	
952201	1-22-00172-Del	09	Oct 24 2024	Haley Weaver			Functional	
952201	1-22-00172-Del	10	Oct 24 2024	Haley Weaver			Functional	
952201	1-22-00172-Del	11	Oct 24 2024	Haley Weaver			Functional	
952201	1-22-00172-Del	12	Jan 9 2025	Brittney Tresenrider			Functional	
952201	1-22-00172-Del	13	Jan 9 2025	Brittney Tresenrider			Functional	
952201	1-22-00172-Del	14	Jan 9 2025	Brittney Tresenrider			Functional	
		B	Jun 17 2022	Nalani Ludington	Oct 27 2023	Others	Functional	
		B-10.13L_02	Sep 20 2022	Others	Oct 25 2023	Haley Weaver	Functional	
		Fh-900_03	Jun 17 2022	Nalani Ludington	Oct 27 2023	Others	Functional	
		LS-150_01	Nov 29 2022	Others	Oct 12 2023	Nalani Ludington	Functional	
		MR-4200_01_eh	Dec 2 2022	Others	Oct 18 2023	Others	Functional	
		MR-4200_02_eh	Dec 12 2022	Others	Oct 18 2023	Others	Functional	
		MR-4200_2.1_eh	Dec 2 2022	Others	Oct 18 2023	Others	Functional	
		MR-7010_01	Sep 30 2022	Others	Oct 26 2023	Others	Functional	
		SA_2700_09_HW_2021	Nov 29 2022	Others	Oct 12 2023	Haley Weaver	Functional	
		SA-2000_02_HW_092021	Nov 29 2022	Others	Oct 12 2023	Haley Weaver	Functional	
		SA-2000_03_HW	Nov 29 2022	Others	Oct 12 2023	Haley Weaver	Functional	
		SA-2700_07_HW	Nov 29 2022	Others	Oct 12 2023	Others	Functional	
		T-10.64R-01	Nov 30 2022	Others	Nov 15 2023	Brendan Quintero	Functional	
		T-10.64R-02	Nov 30 2022	Others	Nov 15 2023	Brendan Quintero	Functional	
		T-300_01	Nov 20 2023	Perris Alfonzo	Aug 7 2024	Perris Alfonzo	Functional	
		T-300_02	Nov 20 2023	Perris Alfonzo	Aug 7 2024	Perris Alfonzo	Functional	
		T-700_01	Nov 20 2023	Perris Alfonzo	Aug 8 2024	Perris Alfonzo	Functional	
		T-700_02	Nov 20 2023	Perris Alfonzo	Aug 8 2024	Perris Alfonzo	Functional	
		W-220.44R_01	Nov 20 2023	Perris Alfonzo	Oct 9 2024	Perris Alfonzo	Functional	
		W270_01	Nov 20 2023	Perris Alfonzo	Oct 9 2024	Perris Alfonzo	Post non-compliant	Pipe not set to grade. Flow underneath the culvert starting to erode beneath the outlet.
		W270_02	Nov 20 2023	Perris Alfonzo	Nov 11 2024	Haley Weaver	Functional	
			Sep 27 2023	Haley Weaver			Functional	

Appendix C

Summer Juvenile Salmonid Population Monitoring Program Annual Report

2024

Green Diamond Resource Company's Annual Report

To

National Marine Fisheries Service

For

Permit 17351-2R

Summer Juvenile Salmonid Population Monitoring Program

2024

Prepared by:

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INTRODUCTION

In 2024, Green Diamond Resource Company (GDRCo) conducted its thirtieth year of summer juvenile salmonid population monitoring, under a National Marine Fisheries Service (NMFS) Section 10 Permit (17351). This permit is required to cover take of Endangered Species Act (ESA) listed salmonids that may result from monitoring activities. The covered species include the Southern Oregon/North Coastal California (SONCC) coho salmon (*Oncorhynchus kisutch*) evolutionarily significant unit (ESU), the California Coastal (CC) Chinook Salmon (*Oncorhynchus tshawytscha*) ESU, and the Northern California (NC) steelhead trout (*Oncorhynchus mykiss*) distinct population segment (DPS). A Scientific Collection Permit (SCP), a Memorandum of Understanding (MOU) for coho salmon and an MOU for summer steelhead from the California Department of Fish and Wildlife (CDFW) were also obtained to allow for the implementation of this project.

Summer juvenile salmonid population monitoring is a component of the Effectiveness Monitoring Program under the GDRCo Aquatic Habitat Conservation Plan (AHCP; GDRCo, 2006). This monitoring program allows GDRCo to obtain annual estimates for juvenile salmonids (coho salmon, steelhead trout, coastal cutthroat trout and occasionally Chinook salmon). The summer population estimates help to establish baseline and long-term trend data on the abundance of juvenile salmonid populations.

Eleven creeks were sampled in 2024 (Appendix 1) and are distributed among five hydrographic planning areas (HPAs) as defined in the GDRCo Aquatic Habitat Conservation Plan (GDRCo 2006). The sample design and protocol employed was described by Hankin and Mohr (2001), and is based primarily on diver observations, with repeat passes and electrofishing used to calibrate the probability of detection. Counts of juvenile coho salmon, 1+ steelhead trout and coastal cutthroat trout were conducted in 2024, and population sizes were estimated.

This report presents the results from the 2024 summer juvenile population monitoring effort and makes select comparisons to past monitoring dating as far back as 1995 in some of these streams. In addition to population estimates, this report summarizes the number of ESA listed salmonids observed, handled, and incidentally taken during each part of project implementation.

METHODS

Study Sites

Eleven monitoring sites were sampled in 2024. The streams surveyed were Ah Pah Creek, Cañon Creek, Hunter Creek, Little Surpur Creek, Lower South Fork Little River, South Fork Ah Pah Creek, South Fork Rowdy Creek / Savoy Creek, South Fork Winchuck River, Sullivan Gulch, Upper South Fork Little River and Wilson Creek. Collectively, these sites represent five HPAs along north coastal California; Smith River, Coastal Klamath, Little River, North Fork Mad River, and Mad River (Appendix 1). These monitoring sites are restricted to anadromous coho salmon habitats located in sub-basins within lands predominantly owned by GDRCo. Each site consists of a linear segment(s) of stream and the extent of each reach was determined by evidence of coho anadromy and can vary in length from year to year.

Sampling Design

The sampling methodologies used by GDRCo for estimating summer juvenile salmonid populations have evolved over the years with advances in fisheries population monitoring techniques. The sampling design described by Hankin and Reeves (1988) was used from 1995 to 2000. From 2001 to the present, the two-phase sampling design described by Hankin and Mohr (2001) was employed. This new sampling design increased the use of diver counts and reduced the amount of electrofishing and the potential deleterious effects on listed species and other stream biota. Using this technique, sampling varies based on stream habitat type. The sampling rate for deep pools is 50% for Phase I and 100% for Phase II dives. For shallow units the sampling rate is 50% for both Phase I and Phase II dives. Riffles are sampled randomly at 8.5% (1 in 12). The electrofishing protocol is a minimum of 3 passes and depletion. Detailed GDRCo field protocols are maintained and available upon request. In 2024, at Lower South Fork Little River (LSFLR) and Upper South Fork Little River (USFLR), the sampling rate for Phase II shallow pools was reduced from 50% to 33% to decrease electrofishing in those reaches. LSFLR and USFLR consistently produce high densities of coho juveniles and this modification to the sampling design was implemented in effort to reduce our electrofishing footprint while still obtaining a reliable population estimate. Details on the electrofishing equipment used are provided in Appendix 2. The NMFS guidelines were followed when operating an electrofisher (Schaeffer and Logan 2000).

In addition to adopting the improved sampling design, there have been other modifications to the protocol over the years. Prior to 1999, the difference between a deep pool and a shallow pool was subjective and based on the surveyors' opinion on electrofishing effectiveness for the particular unit. Beginning in the 1999 field season, the decision between deep or shallow pools was based solely on depth. A pool less than 3.4 feet was a shallow pool. This provided better consistency between personnel, improving the validity of comparisons of population estimates between different streams, surveyors, and organizations or agencies. Additionally, starting in 2001, run habitat was grouped with the shallow pool habitat stratum because small sample sizes for runs prohibited treating them separately. This change was adopted to improve the estimates because of the increased number of calibrated shallow pools. In 2024, an attempt was made to have at least three shallow pools calibrated with electrofishing per reach. In stream reaches that did not produce three calibrated pools based solely on the protocol, one to three additional Phase I shallow pool units were randomly selected to be calibrated with electrofishing after diving was complete. The intent is to better understand the relationship between dive count and electrofishing estimates. In 2024, twenty-one additional shallow pools from eight separate reaches were calibrated with electrofishing and can be used to help build the relationship between dive count and electrofishing estimates.

Population Estimates

Estimates and confidence intervals were generated using the updated estimators of abundance and variance described by Mohr and Hankin (2005). The estimators were written in R code by Mike Mohr and Western EcoSystems Technology Inc. (WEST-Inc.). The primary improvements in these estimators are the addition of bias adjustments associated with diver count and electrofishing probabilities of detection, to reduce the bias of the bounded counts and jackknife estimators, respectively. This improved estimator was applied to the earlier (pre-2005) data as well. Where the application of these estimators was not possible, due to either protocol variance or small sample size, hard counts or bounded counts, were used. These were usually limited to a single habitat stratum (e.g., runs) and could not be extrapolated to the entire stream for that year.

During the diving component of the surveys, counts were recorded for coho, Chinook, cutthroat (≥1+), and steelhead (≥1+). No attempts were made to count 0+ trout, though they are enumerated during electrofishing. Estimates were generated for coho, steelhead and cutthroat only. Each stream was surveyed to the upper extent of coho anadromy. Surveyed extents for each stream are depicted on maps provided in Appendix 1.

For estimates presented in this report, the shallow unit (SU) habitat stratum includes runs (1995-2000), riffles, and shallow pools (which included runs after 2000). When combined, the estimates of abundance and variances of each stratum were summed for the combined category estimate (Zar, 1999). The product of the variance for SU was then used to calculate the confidence interval (CI). In cases where the sample size for a shallow habitat type was one, an estimate could not be calculated, and thus, the hard count or bounded count for this habitat type was summed with the estimates for the other SU habitat types. Confidence intervals were then calculated as described above using the sum of available variances.

While all data have been audited for accuracy and consistency as of this report, GDRCo maintains a data quality routine that occasionally detects previously unidentified errors. Any historical estimates presented in this report that may differ from previously reported figures, should be considered the most accurate.

RESULTS

Survey Effort and Habitat Composition

Stream habitat composition and sampling rates were summarized for each stream surveyed in 2024 (Table 1). Overall, the desired sampling rate for the different habitat stratum was achieved. The habitat stratum “other” was not surveyed for summer juvenile salmonids. Other habitats included: dry stream sections, isolated side-channel pools clearly not providing fish habitat, or units where LWD, SWD or undercut banks were abundant enough to prevent effective observation, safe electrofishing or safe diving. No direct mortality of ESA listed SONCC coho salmon, CC Chinook salmon, or NC steelhead occurred during the habitat typing process.

Dive Counts

A summary of the fish counts from the dive portion of the stream sampling was compiled for all sites monitored (Table 2). A total of 5,420 juvenile salmonids were observed in 2024. Four salmonid species were observed but coho and steelhead were the two dominant species, accounting for 59% and 33% respectively, of the total salmonid observations. No direct mortality of ESA listed SONCC coho salmon, CC Chinook salmon, or NC steelhead occurred during the dive component.

Electrofishing

The eleven stream reaches were electroshocked from July 17th through September 13th, 2024. A summary of sampling dates, habitat units sampled, maximum water temperature, electrofishing effort, maximum conductivity and maximum voltage used for the electrofishing portion of the survey are provided below for each site (Table 3). The water temperatures and conductivities at all sampled sites were within the acceptable ranges.

The total number of individuals captured during the electrofishing portions of the surveys and associated mortality by stream and species were summarized (Table 4). A total of 6,426 salmonids were captured. The majority (77.3%) of captures were 0+ trout, followed by coho (13.6%), steelhead (6.5%) and cutthroat (2.5%). Details on overall mortality rates associated with electrofishing are described below in the mortality section of the discussion. A summary of the possible ESA listed salmonid mortalities resulting from the 2024 electrofishing effort was compiled (Table 5).

Summer Juvenile Population Estimates

The 2024 population estimates, and corresponding confidence intervals were summarized for the sites sampled (Table 6). Bar graphs were used to summarize the full history of estimates for coho (Figures 1-4) and steelhead (Figures 5-8) by stream for the 11 creeks sampled. The data used to create these figures are presented in Appendix 3. When possible, population estimates were generated using the most recent estimators of abundance and variance including the bias adjustments described in Mohr and Hankin (2005). In some cases, there were no units available, only one unit available or not enough units were sampled of a certain habitat type to use the standard estimation procedure. In those cases, either hard counts or single unit estimates with no variance are displayed. In other cases, the protocol was still being developed so the data was not available to use the standard estimation procedure. In those cases, the hard count numbers were used or the hard count numbers were added to the estimated numbers to give a value with no variance. Footnotes are included in Appendix 3 to indicate the estimation method used to calculate the values. The results presented in Appendix 3 are only for those sites monitored during the 2024 sampling period. Refer to AHCP biennial reports (e.g. GDRCo 2015) for information on discontinued monitoring sites.

Table 1. Summary of stream habitat composition and sampling effort at sites monitored by GDRCo in 2024.

		Habitat Type				
Creek Name	**Criteria**	**Deep Pool**	**Shallow Pool**	**Riffle**	**Other**	**Total**
Ah Pah Creek	# Units	5	121	141	54	321
	Surveyed Units	3	59	10	0	72
	Percent Surveyed	60.0%	48.8%	7.1%	0.0%	22.4%
Cañon Creek	# Units	26	98	128	39	291
	Surveyed Units	13	49	11	0	73
	Percent Surveyed	50.0%	50.0%	8.6%	0.0%	25.1%
Hunter Creek	# Units	26	72	114	39	251
	Surveyed Units	12	37	10	0	59
	Percent Surveyed	46.2%	51.4%	8.8%	0.0%	23.5%
Little Surpur Creek	# Units	0	10	8	7	25
	Surveyed Units	0	6	3	0	9
	Percent Surveyed	0.0%	60.0%	37.5%	0.0%	36.0%
Lower South Fork Little River	# Units	25	118	116	30	289
	Surveyed Units	15	39	8	0	62
	Percent Surveyed	60.0%	33.1%	6.9%	0.0%	21.5%
SF Ah Pah Creek	# Units	1	68	67	14	150
	Surveyed Units	1	32	6	0	39
	Percent Surveyed	100.0%	47.1%	9.0%	0.0%	26.0%
SF Rowdy and Savoy Creeks	# Units	6	99	133	28	266
	Surveyed Units	3	50	10	0	63
	Percent Surveyed	50.0%	50.5%	7.5%	0.0%	23.7%
SF Winchuck River	# Units	35	121	182	45	383
	Surveyed Units	19	62	15	0	96
	Percent Surveyed	54.3%	51.2%	8.2%	0.0%	25.1%
Sullivan Gulch	# Units	1	27	30	12	70
	Surveyed Units	1	14	3	0	18
	Percent Surveyed	100.0%	51.9%	10.0%	0.0%	25.7%
Upper South Fork Little River	# Units	20	103	108	16	247
	Surveyed Units	10	37	9	0	56
	Percent Surveyed	50.0%	35.9%	8.3%	0.0%	22.7%
Wilson Creek	# Units	25	123	126	65	339
	Surveyed Units	11	59	13	0	83
	Percent Surveyed	44.0%	48.0%	10.3%	0.0%	24.5%
Total	# Units	170	960	1,153	349	2,632
	Surveyed Units	88	444	98	0	630
	Percent Surveyed	51.8%	46.3%	8.5%	0.0%	23.9%

Table 2. Summary of salmonids observed during dive counts at each monitoring site sampled by GDRCo in 2024.

Creek Name	**0+ Chinook**	**0+ Coho**	**1+ Cutthroat**	**1+ Steelhead**
Ah Pah Creek	0	26	76	82
Cañon Creek	3	1	0	108
Hunter Creek	0	0	47	91
Little Surpur Creek	0	0	9	6
Lower South Fork Little River	0	1,759	43	50
SF Ah Pah Creek	0	0	31	34
SF Rowdy and Savoy	0	0	14	116
SF Winchuck River	1	287	205	659
Sullivan Gulch	0	233	0	2
Upper South Fork Little River	0	766	12	32
Wilson Creek	0	109	14	604
Total	4	3,181	451	1,784

Table 3. Summary of electroshocking sampling effort, maximum water temperature (MWT), maximum water conductivity (MC), maximum voltage (MV) and total time spent electrofishing for each monitoring site sampled by GDRCo in 2024.

Creek Name	Start Date	End Date	Sample Days	# Units Sampled * Riffle	Shallow Pool	MWT (°C)	MC (µS/cm)	MV (v)	Electrofishing Effort (sec.)
Ah Pah Creek	13-Aug	14-Aug	2	10	3	16.5	79	200	5,535
Cañon Creek	17-Jul	18-Jul	2	11	3	17.3	265	200	14,780
Hunter Creek	20-Aug	22-Aug	2	10	3	17.5	72	200	9,560
Little Supur Creek	5-Aug	5-Aug	1	3	0	14.2	73	200	1,279
Lower South Fork Little River	25-Jul	6-Aug	3	8	12	15.7	79	200	21,824
SF Ah Pah Creek	12-Aug	14-Aug	2	6	3	17.3	81	200	2,935
SF Rowdy and Savoy	30-Aug	6-Sep	4	10	3	15.5	103	200	11,863
SF Winchuck River	6-Sep	13-Sep	4	15	3	15.6	75	200	18,156
Sullivan Gulch	18-Jul	23-Jul	2	3	3	16.3	197	200	3,475
Upper South Fork Little River	23-Jul	25-Jul	3	9	5	16.0	56	200	17,389
Wilson Creek	26-Aug	30-Aug	4	13	3	14.3	101	200	13,844
Total:			29	98	41				120,640

** Units sampled by electroshocking.*

Table 4. Summary of salmonid captures and mortalities associated with electroshocking conducted at monitoring sites sampled by GDRCo in 2024.

Creek Name	Criteria	0+ Coho	1+ Steelhead	1+ Cutthroat	0+ Trout	0+ Chinook
Ah Pah Creek	# Captured	-	6	23	64	-
	# of Mortalities	-	0	0	0	-
	Percent Mortalities	-	0.0%	0.0%	0.0%	-
Cañon Creek	# Captured	-	24	-	1360	-
	# of Mortalities	-	0	-	6	-
	Percent Mortalities	-	0.0%	-	0.4%	-
Hunter Creek	# Captured	-	72	13	270	-
	# of Mortalities	-	0	0	0	-
	Percent Mortalities	-	0.0%	0.0%	0.0%	-
Little Surpur Creek	# Captured	-	3	1	50	-
	# of Mortalities	-	0	0	0	-
	Percent Mortalities	-	0	0.0%	0.0%	-
Lower South Fork Little River	# Captured	656	8	25	531	-
	# of Mortalities	1	0	0	3	-
	Percent Mortalities	0.2%	0.0%	0.0%	0.6%	-
SF Ah Pah Creek	# Captured	-	-	16	75	-
	# of Mortalities	-	-	0	0	-
	Percent Mortalities	-	-	0.0%	0.0%	-
SF Rowdy and Savoy Creeks	# Captured	-	102	14	545	-
	# of Mortalities	-	0	0	0	-
	Percent Mortalities	-	0.0%	0.0%	0.0%	-
SF Winchuck River	# Captured	23	86	47	963	-
	# of Mortalities	0	0	0	1	-
	Percent Mortalities	0	0.0%	0.0%	0.1%	-
Sullivan Gulch	# Captured	51	1	-	255	-
	# of Mortalities	1	0	-	2	-
	Percent Mortalities	2.0%	0.0%	-	0.8%	-
Upper South Fork Little River	# Captured	143	21	18	362	-
	# of Mortalities	0	0	0	1	-
	Percent Mortalities	0.0%	0.0%	0.0%	0.3%	-
Wilson Creek	# Captured	4	97	1	496	-
	# of Mortalities	0	0	0	0	-
	Percent Mortalities	0.0%	0.0%	0	0.0%	-
Total	# Captured	877	420	158	4,971	-
	# of Mortalities	2	0	0	13	-
	Percent Mortalities	0.23%	0.00%	0.00%	0.26%	-

"-" represents no capture of species.

Table 5. Summary of captures and possible mortalities for Federal Endangered Species Act (ESA) listed salmonids associated with electroshocking conducted at monitoring sites sampled by GDRCo in 2024.

Species	ESU / DPS	ESA Status	Age Class	Captured^	Mortalities #	Mortalities %
Coho	SONCC	Threatened	0+	877	2	0.23%
Steelhead	NC	Threatened	0+	2,508	12	0.48%
Steelhead	NC	Threatened	1+	54	0	0.00%
Total				3,439	14	0.41%

^ Captured by electroshocking

Table 6. Summer juvenile population estimates and confidence intervals (CI) for three salmonid species at monitoring sites sampled by GDRCo in 2024.

		Deep Pool		Shallow Pool		Riffle		Total
Creek Name	**Species**	**Estimate**	**95% CI**	**Estimate**	**95% CI**	**Estimate**	**95% CI**	**Estimate**
Ah Pah Creek	Coho	0	0	62	58	0	0	62
	Cutthroat	36	25	158	55	197	168	392
	Steelhead	33	24	170	37	85	83	288
Cañon Creek	Coho	0	0	0	0	0	0	0
	Cutthroat	0	0	0	0	0	0	0
	Steelhead	113	33	235	83	199	161	547
Hunter Creek	Coho	0	0	0	0	0	0	0
	Cutthroat	88	41	45	29	109	123	242
	Steelhead	180	110	101	59	341	430	622
Little Surpur Creek	Coho	-	-	0	0	0	0	0
	Cutthroat	-	-	19	8	3	4	22
	Steelhead	-	-	13	7	8	7	21
Lower SF Little River	Coho	1,852	305	4,041	753	1,466	1,346	7,358
	Cutthroat	52	13	204	110	0	0	256
	Steelhead	62	16	99	35	0	0	162
SF Ah Pah Creek	Coho	0	0	0	0	0	0	0
	Cutthroat	3	0	85	29	78	61	166
	Steelhead	0	0	46	24	0	0	46
SF Rowdy - Savoy Creek	Coho	0	0	0	0	0	0	0
	Cutthroat	5	5	37	15	173	226	215
	Steelhead	43	24	237	69	1230	957	1,511
SF Winchuck River	Coho	224	86	368	113	0	0	592
	Cutthroat	188	35	301	81	446	419	934
	Steelhead	564	144	942	176	570	369	2,077
Sullivan Gulch	Coho	25	0	554	126	40	76	619
	Cutthroat	0	0	0	0	0	0	0
	Steelhead	1	0	4	7	0	0	5
Upper SF Little River	Coho	615	188	1,968	397	96	94	2,679
	Cutthroat	12	8	86	42	96	54	194
	Steelhead	36	20	317	125	96	87	449
Wilson Creek	Coho	180	98	160	74	0	0	340
	Cutthroat	25	23	22	19	0	0	47
	Steelhead	603	273	1028	274	136	106	1,766
Total	Coho	2,895	676	7,152	1,521	1,602	1,516	11,649
	Cutthroat	409	149	957	387	1,102	1,054	2,468
	Steelhead	1,636	645	3,193	897	2,665	2,201	7,493

- not applicable

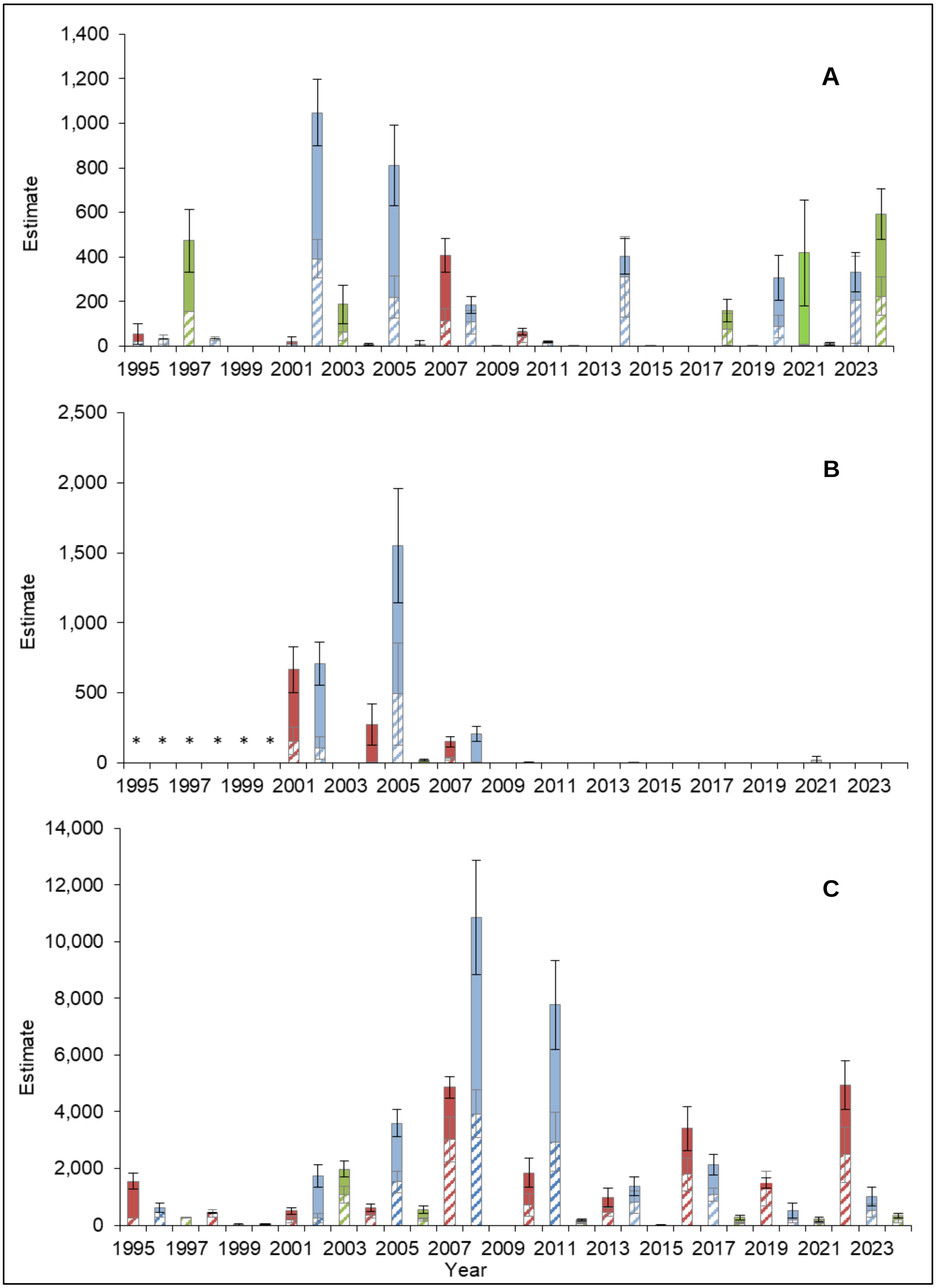

Figure 1. Histograms of Smith River HPA summer juvenile coho population estimates with confidence intervals for deep pools (diagonal striped bars) and shallow units (solid bars) at SF Winchuck River (A), SF Rowdy/Savoy Creeks (B), and Wilson Creek (C) sampled by GDRCo. Colors indicate three distinct cohorts of coho and an asterisk (*) indicates year(s) when sampling was not conducted. Scale on y-axes vary among histograms.

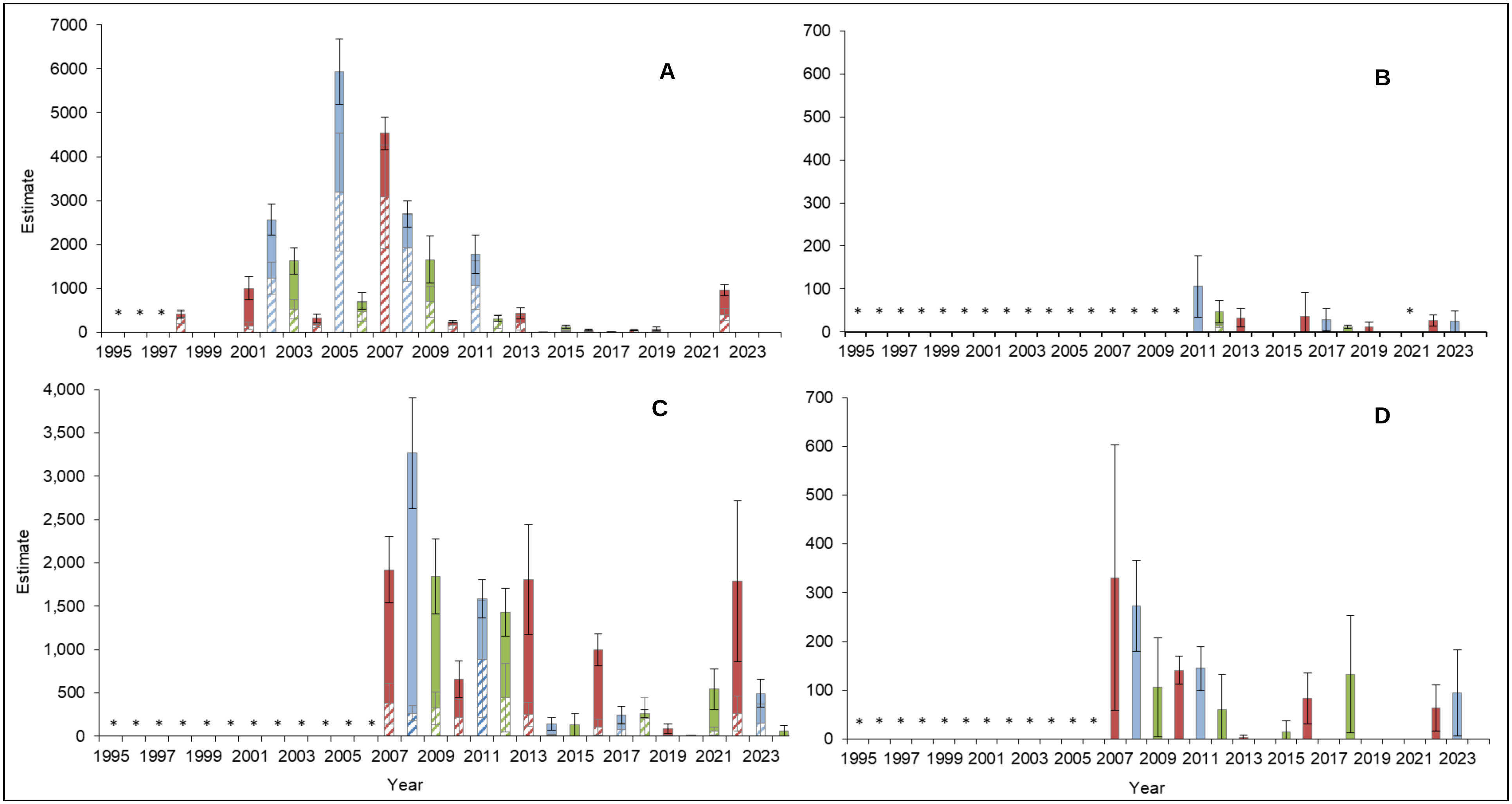

Figure 2. Histograms of Coastal Klamath HPA summer juvenile coho population estimates with confidence intervals for deep pools (diagonal striped bars) and shallow units (solid bars) at Hunter Creek (A), Little Surpur Creek (B), Ah Pah Creek (C), and SF Ah Pah Creek (D) sampled by GDRCo. Colors indicate three distinct cohorts of coho and an asterisk (*) indicates year(s) when sampling was not conducted. Scale on y-axes vary among histograms.

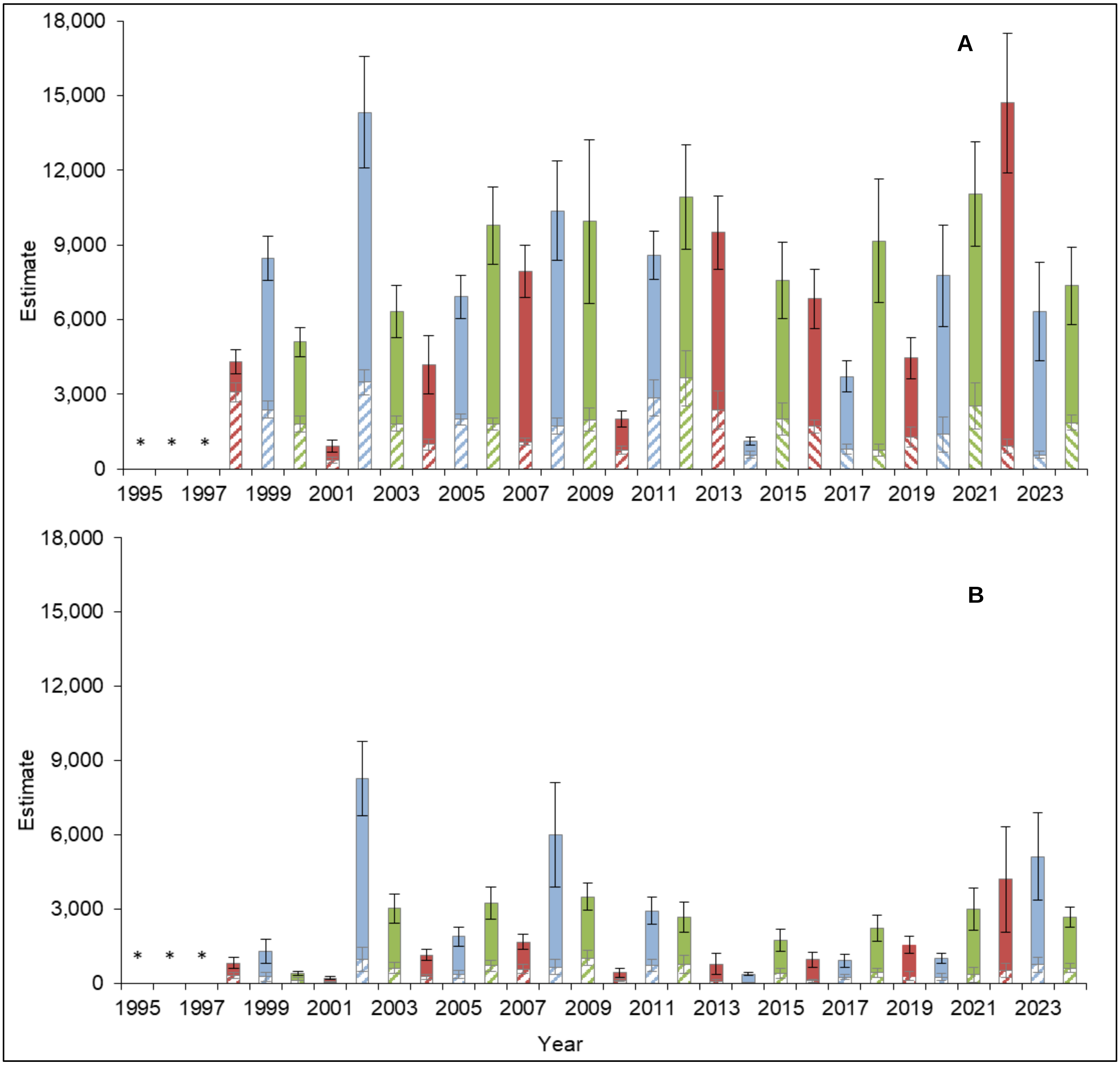

Figure 3. Histograms of Little River HPA summer juvenile coho population estimates with confidence intervals for deep pools (diagonal striped bars) and shallow units (solid bars) at Lower SF Little River (A), and Upper SF Little River (B) sampled by GDRCo. Colors indicate three distinct cohorts of coho and an asterisk (*) indicates year(s) when sampling was not conducted.

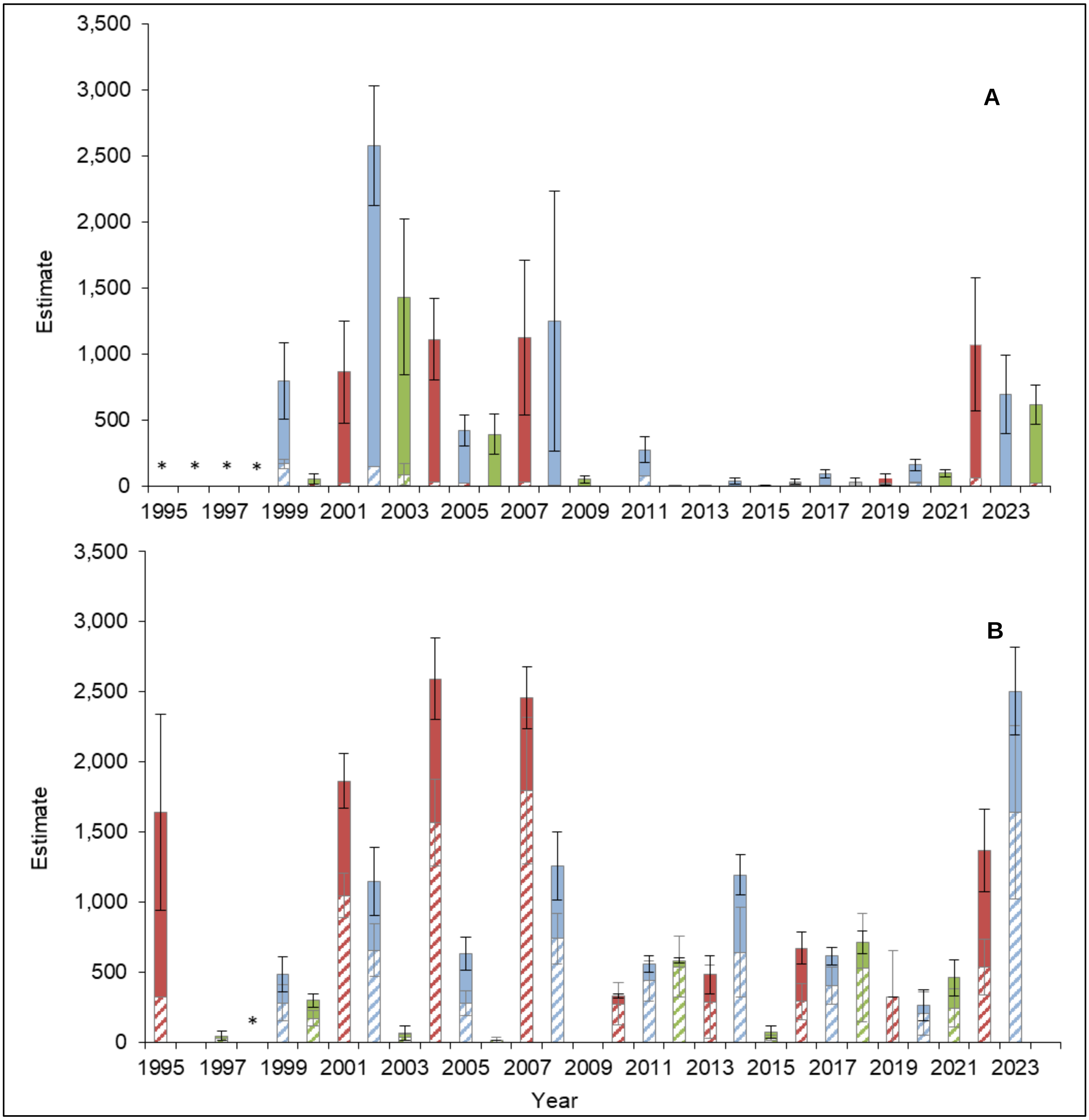

Figure 4. Histograms of Mad River and North Fork Mad River HPAs summer juvenile coho population estimates with confidence intervals for deep pools (diagonal striped bars) and shallow units (solid bars) at Sullivan Gulch (A) and Cañon Creek (B) sampled by GDRCo. Colors indicate three distinct cohorts of coho and an asterisk (*) indicates year(s) when sampling was not conducted.

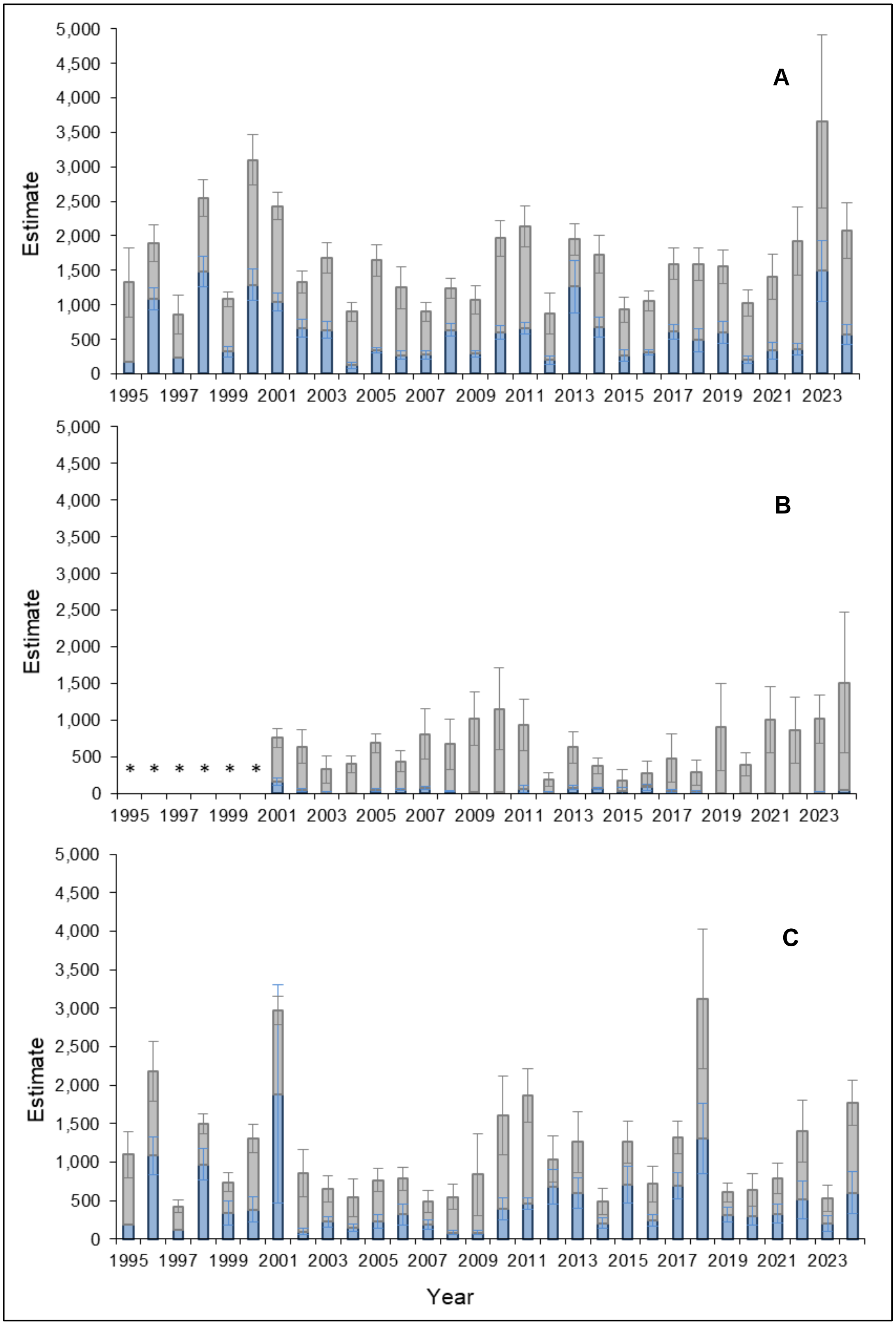

Figure 5. Histograms of Smith River HPA summer juvenile steelhead population estimates with confidence intervals for deep pools (blue) and shallow units (gray) at SF Winchuck River (A), SF Rowdy/Savoy Creeks (B), and Wilson Creek (C) sampled by GDRCo. An asterisk (*) indicates year(s) when sampling was not conducted.

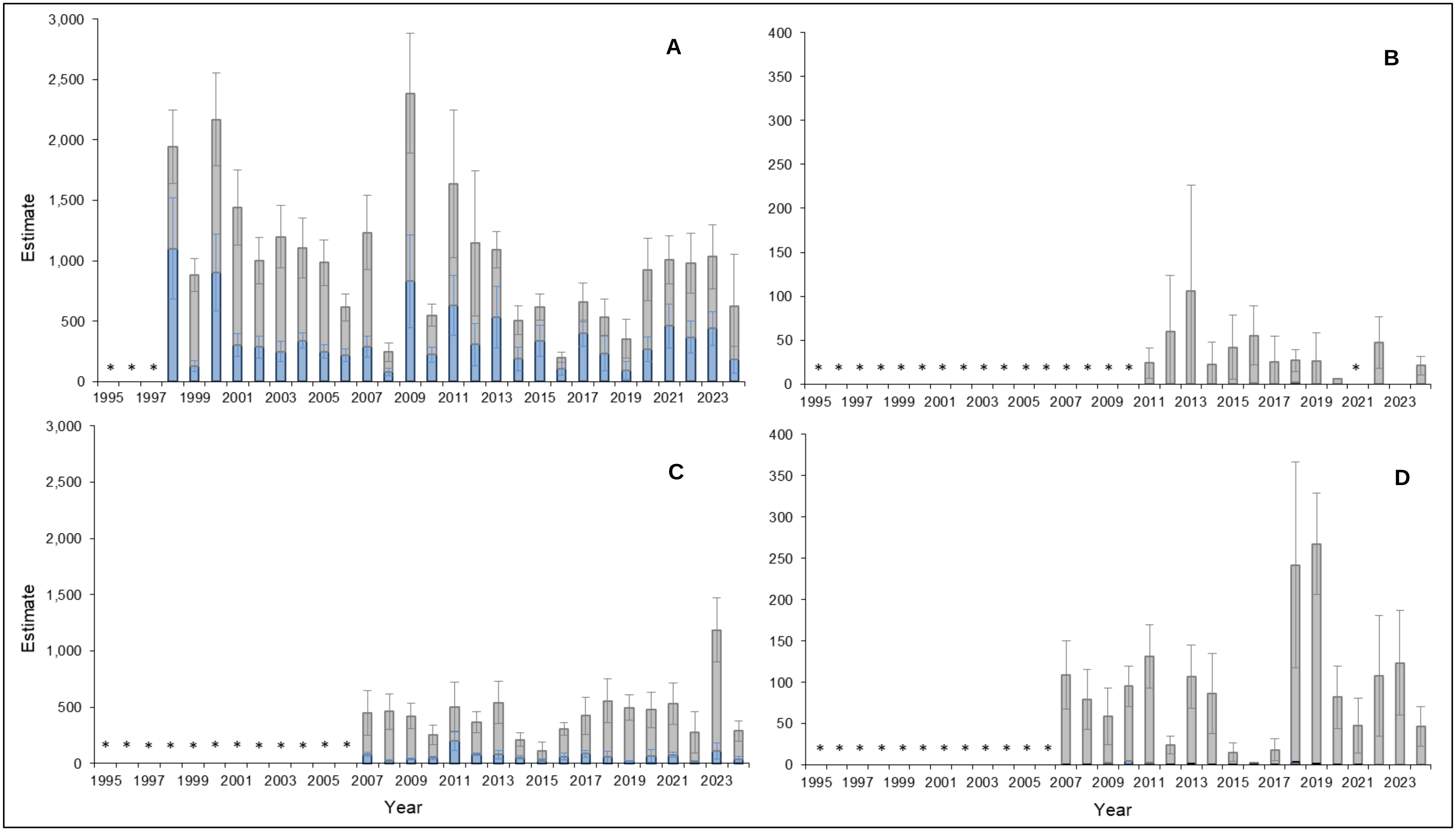

Figure 6. Histograms of Coastal Klamath HPA summer juvenile steelhead population estimates with confidence intervals for deep pool units (blue) shallow units (gray) at Hunter Creek (A), Little Surpur Creek (B), Ah Pah Creek (C), and SF Ah Pah Creek (D) sampled by GDRCo. An asterisk (*) indicates year(s) when sampling was not conducted. Scale on y-axes vary among histograms.

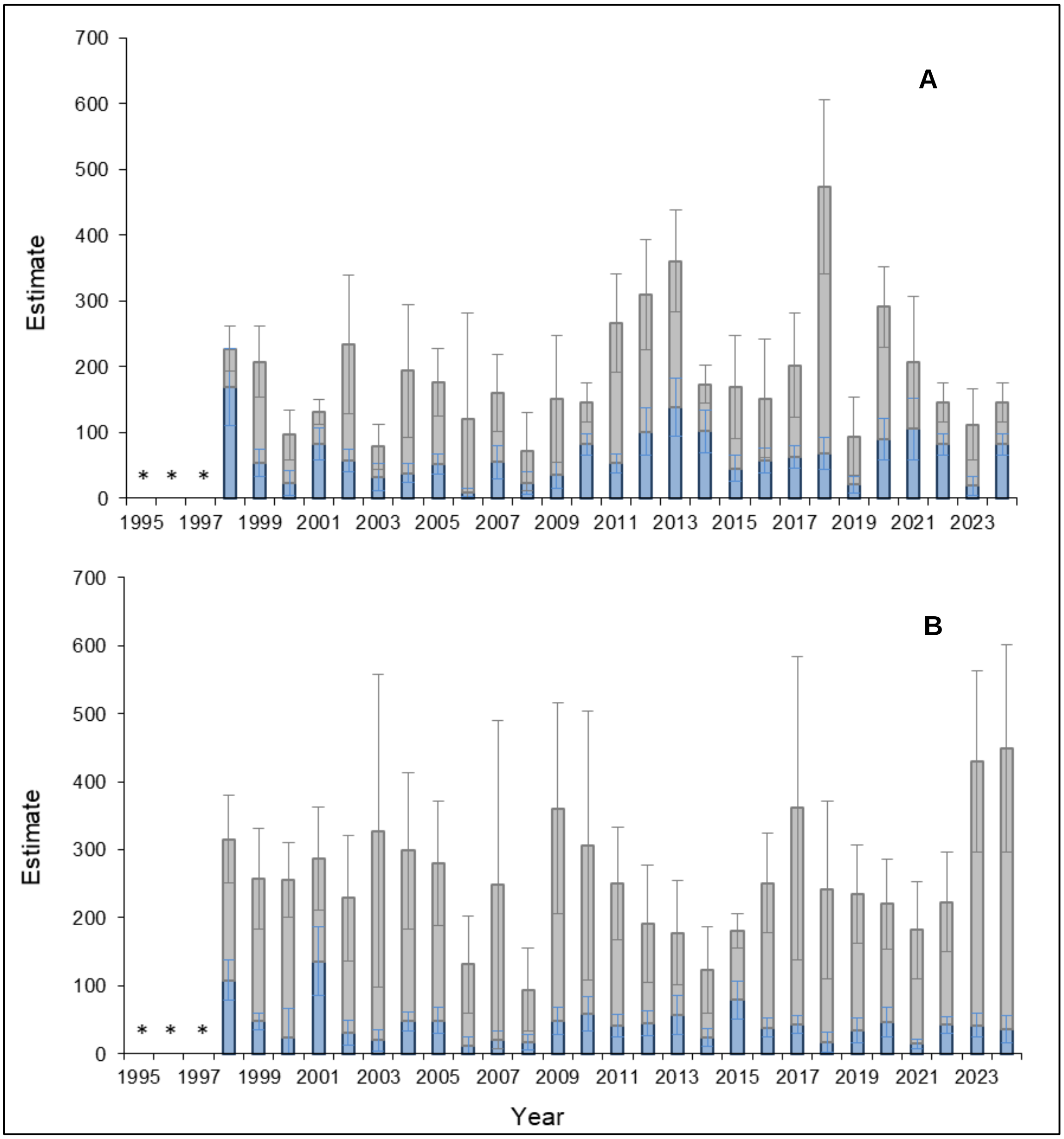

Figure 7. Histograms of Little River HPA summer juvenile steelhead population estimates with confidence intervals for deep pool units (blue) and shallow units (gray) at Lower SF Little River (A), and Upper SF Little River (B) sampled by GDRCo. An asterisk (*) indicates year(s) when sampling was not conducted.

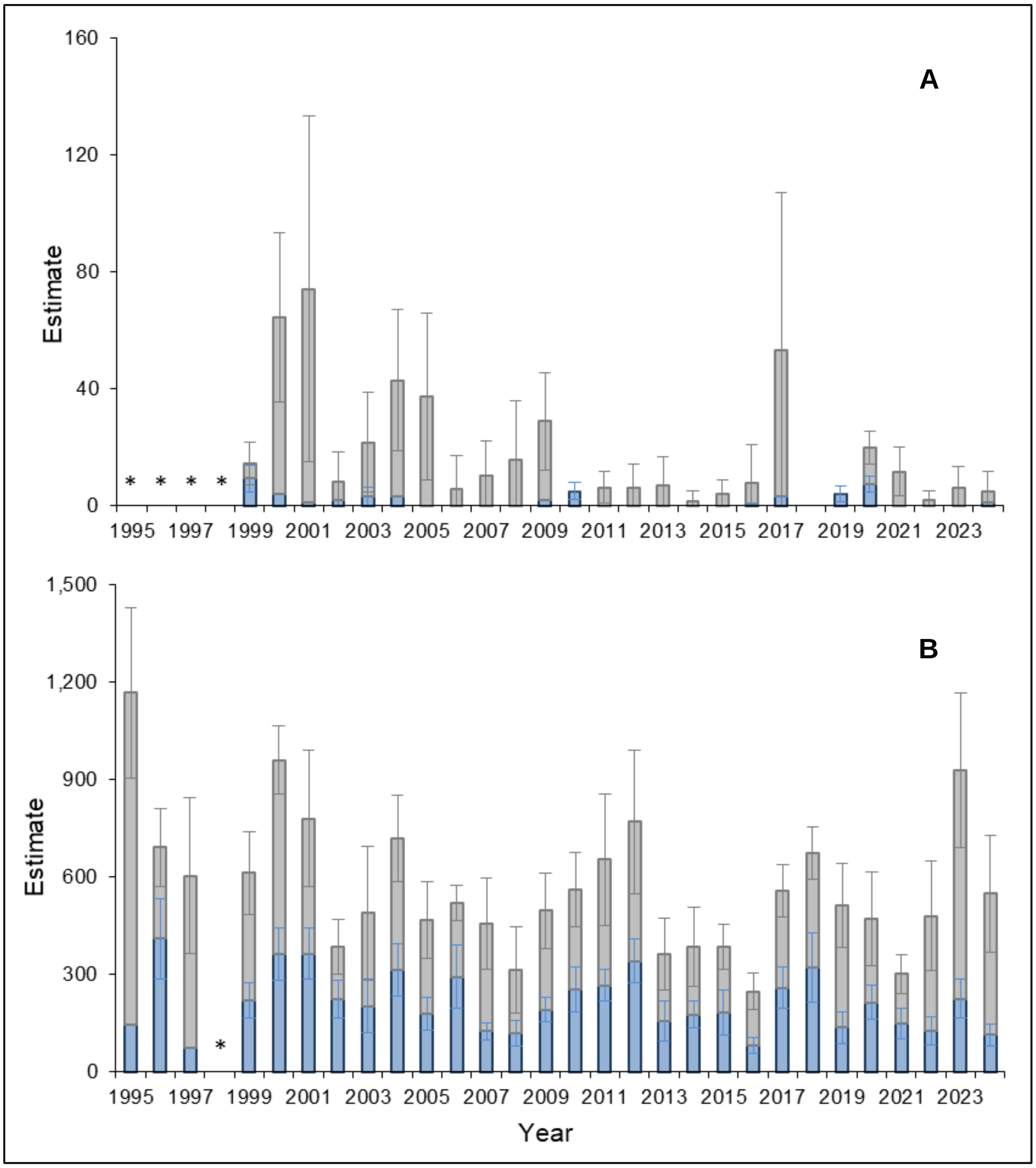

Figure 8. Histograms of Mad River and North Fork Mad River HPAs summer juvenile steelhead population estimates with confidence intervals for deep pool units (blue) and shallow units (gray) at Sullivan Gulch (A) and Cañon Creek (B) sampled by GDRCo. An asterisk (*) indicates year(s) when sampling was not conducted. Scale on y-axes vary among histograms.

DISCUSSION

Population Estimates

There was a lot of variability from north to south in summer juvenile population estimates for coho among the sites monitored in 2024. In the Smith River HPA, this year's cohort at SF Winchuck continues to be the most resilient population (estimate=592). It has been on a steady increase since it had four separate estimates in a row that were less than 10 (2006, 2009, 2012 and 2015). Coho estimates in SF Winchuck have been showing positive signs of increasing over the last seven years and it will be interesting if that trend continues. There were no coho detected in South Fork Rowdy/Savoy in 2024 despite the 2021 coho estimate (21) that ended a six-year streak of no coho detections. Coho at South Fork Rowdy/Savoy over the last 15 years have been low or not detected. This past summer the Rowdy Creek fish hatchery infrastructure was retrofitted to address adult and juvenile fish passage issues that have plagued the watershed for decades. It will be interesting to see if coho estimates increase in this watershed during the years following restoration implementation.

GDRCo has operated a turbidity threshold sampling station in lower SF Winchuck since 2008 and the watershed has consistently produced some of the lowest suspended sediment values observed across our California timberlands. The reason for the lack of coho in the SF Winchuck basin is unclear but water quality does not appear to be a major contributing factor. Wilson Creek is our most southern watershed in the Smith River HPA. The 2024 coho estimate (340) in Wilson Creek is part of the weakest strength cohort; however, the estimates have slowly increased overtime since 2009 when the coho estimate was 0.

Population estimates calculated in the Coastal Klamath HPA continued to be variable at the monitoring sites in 2024. This weakest strength cohort only had detections in one of the four sites. Hunter Creek estimates over the last 10 years have been low and despite having an increased estimate in 2022 (956), the 2024 coho estimate was zero for the second time in a row for this cohort. There have been extensive habitat restoration projects implemented in Hunter Creek over the last 15 years and 2022 was the first apparent increase in population since the projects were implemented. We will continue to watch these populations closely to see if population estimates increase in Hunter Creek in the coming years as a potential response to restoration efforts. Little Surpur Creek was surveyed in 2024 and no coho were observed. The 2024 coho estimate (62) for Ah Pah Creek was the lowest estimate on record for this cohort. There were no coho observed in SF Ah Pah Creek in 2024, which was the second time in a row for this cohort. A multi-year large-scale restoration project began the implementation process near the confluence of Ah Pah Creek and SF Ah Pah Creek and will continue downstream to the confluence with NF Ah Pah. Hopefully this work will support recovery of coho populations in the future.

In January of 2024, there was a major winter storm that moved through Humboldt County. Streams with USGS gauges recorded significant levels of discharges and stage heights. January 13th was the most significant rainfall event with some areas such as the Mad River basin receiving over 3 inches in a 24-hour period. The timing of that event coincided with recent observations of chinook salmon and coho salmon spawning in the Mad River and Ah Pah Creek. Cañon Creek was significantly impacted by the high flow event and had major changes to the channel morphology and LWD distribution.

The Mad River and North Fork Mad River HPAs have been a relatively stable producer of coho in recent years with most cohorts displaying positive trends. Despite the large winter storm, Sullivan Gulch had a coho estimate of 619, which is a significant increase for this cohort. The Cañon Creek coho estimate was 0 in 2024 for this weakest strength cohort. With the lack of coho observations in 2024, it is possible that Cañon Creek had low coho egg to fry survival after the January storm based on the timing of spawning and the degree of bedload movement.

The Little River HPA continues to be the most stable producer of coho juveniles on GDRCo ownership. The 2024 Lower SF Little River coho estimate (7,358) was just below average for this site (7,393). The 2024 Upper SF Little River coho estimate (2,679) was above average for this site (2,255).

In 2024, the coho estimate of all sampled reaches was 11,649. The last time this cohort was estimated was in 2021 with an estimate of 15,790 for all sampled reaches (13,018 in 2018 and 9,648 in 2015). The Little River HPA averages about 67% (range 18% in 2001 to 96% in 2015) of the combined coho estimate for all sample reaches each year.

The cause(s) of the observed coho juvenile population dynamics is unclear but they are presumably a result of multiple factors, including climate, ocean conditions, predator-prey dynamics, spawning and rearing habitat availability, and anthropogenic disturbances, acting synergistically. A detailed analysis is planned for the future and will possibly explain which of these factors are associated with the observed changes and confirm the existence of a pattern in summer juvenile coho salmon population estimates.

Steelhead juvenile estimates for 2024 were also variable among sites monitored. Comparing the 2024 estimates to the long-term averages shows that 5 out of the 11 sites were above their respective long-term averages. Sites with the most consistent and largest population estimates over time continue to be in the northernmost HPA's. There is no clear explanation for the observed changes in 2024 or the dynamics in steelhead juveniles documented over the term of this monitoring project. The cause(s) are likely the result of similar factors as mentioned above for coho salmon. Again, a detailed analysis is planned which should explore if some of these factors are associated with the observed changes in summer juvenile steelhead trout population estimates.

Mortalities

The efforts by GDRCo fisheries staff to minimize take of listed species were effective in 2024. Of the 6,426 salmonids captured during 34 hours (120,640 seconds) of electrofishing, there were thirteen trout 0+ mortalities and two coho 0+ mortalities. The overall mortality rate for electroshocked salmonids in 2024 was 0.23% (15 out of 6,426; Table 4). The overall mortality rate for possible ESA listed electroshocked salmonids in 2024 was 0.41% (14 of 3,439; Table 5). These fish were likely overexposed to electrical shock which resulted in direct mortality. Two of the fourteen listed salmonid mortalities (1 coho 0+ and 1 trout 0+) were found stuck in a pocket of the mesh in-stream holding pen used for fish recovery. The new holding pens had a different design with an unforeseen hazard and were modified immediately following this incident to prevent this from happening again. There were no other mortalities associated with this piece of equipment. This exceptionally low mortality is believed to be a direct result of the dedicated efforts from a consistent staff of well-trained and experienced fisheries professionals employed at GDRCo.

Electrofishing is a valuable sampling technique but poses a risk to fish health (Snyder, 2003). Green Diamond followed strict protocol and ensured proper training of field crews to alleviate this potential risk. The crew monitored stream temperature and conductivity prior to and during electrofishing to confirm that temperatures were less than or equal to 18°C and/or water conductivity was less than or equal to 350 μS/cm. Finally, efforts were made to keep holding time of fish to a minimum, and when necessary, in-stream mesh holding pens were used to ensure that fish were retained in cold, well-oxygenated water.

With the high abundance of coho observed in 2022, a new technique of holding fish was developed and was used again in 2024. This technique involved using a block net draped across or along the wetted channel in an adjacent habitat unit such that part of the net would be submerged but the sides of the net would remain above the water (Figure 9). This allowed for a much larger area to hold fish while keeping them contained so that they could be released into the sampled unit when complete. We found this technique very easy to set up and less stressful to the captured fish. We would highly recommend this technique in scenarios where standard holding pens may get crowded.

Figure 9. Photo of temporary fish holding technique utilized by GDRCo in 2024 to increase volume of holding area. This one was used for 0+ fish and the blue hamper in the background was used for the three 1+ fish that were captured in the sampled unit.

Coordinating Research Efforts

Green Diamond maintains an open dialogue with various federal, state, and tribal agencies to avoid sampling redundancy whenever possible.

Acknowledgments

Several people contributed to the implementation and continued success of this monitoring project and are worthy of acknowledgement and recognition. First, thank you to the following individuals for their hard work, long hours and dedicated efforts conducting the field work: Erin Phillips, Jordan Spence, Eli Martineau and Dominick Davis. Thank you to Neil Cheatum for his continued efforts and technical support in maintaining and enhancing our data management system. Last, but not least, thank you to both Matt Nannizzi and Pat Righter for their technical expertise, thoughtful input, and guidance during project implementation and review of this report.

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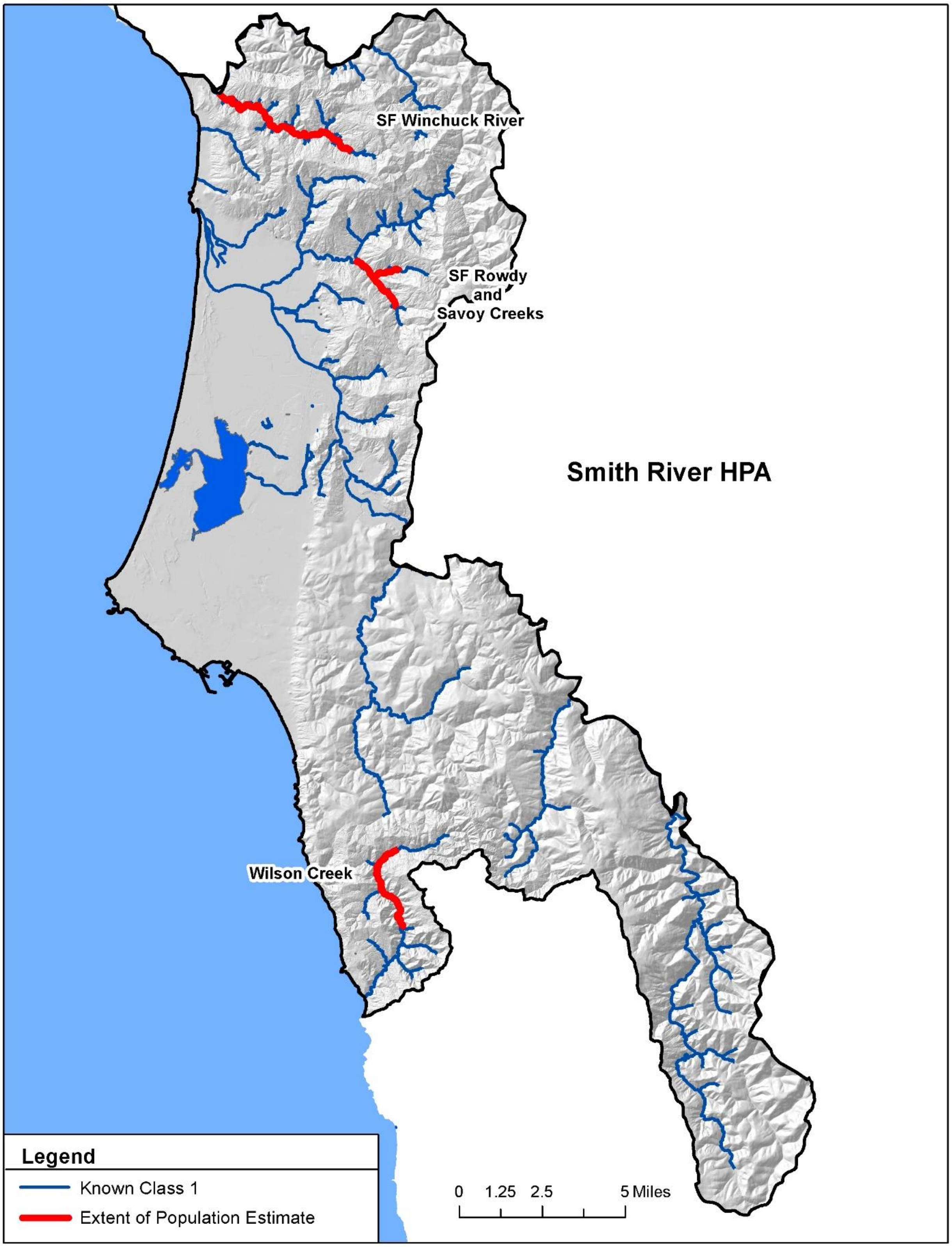
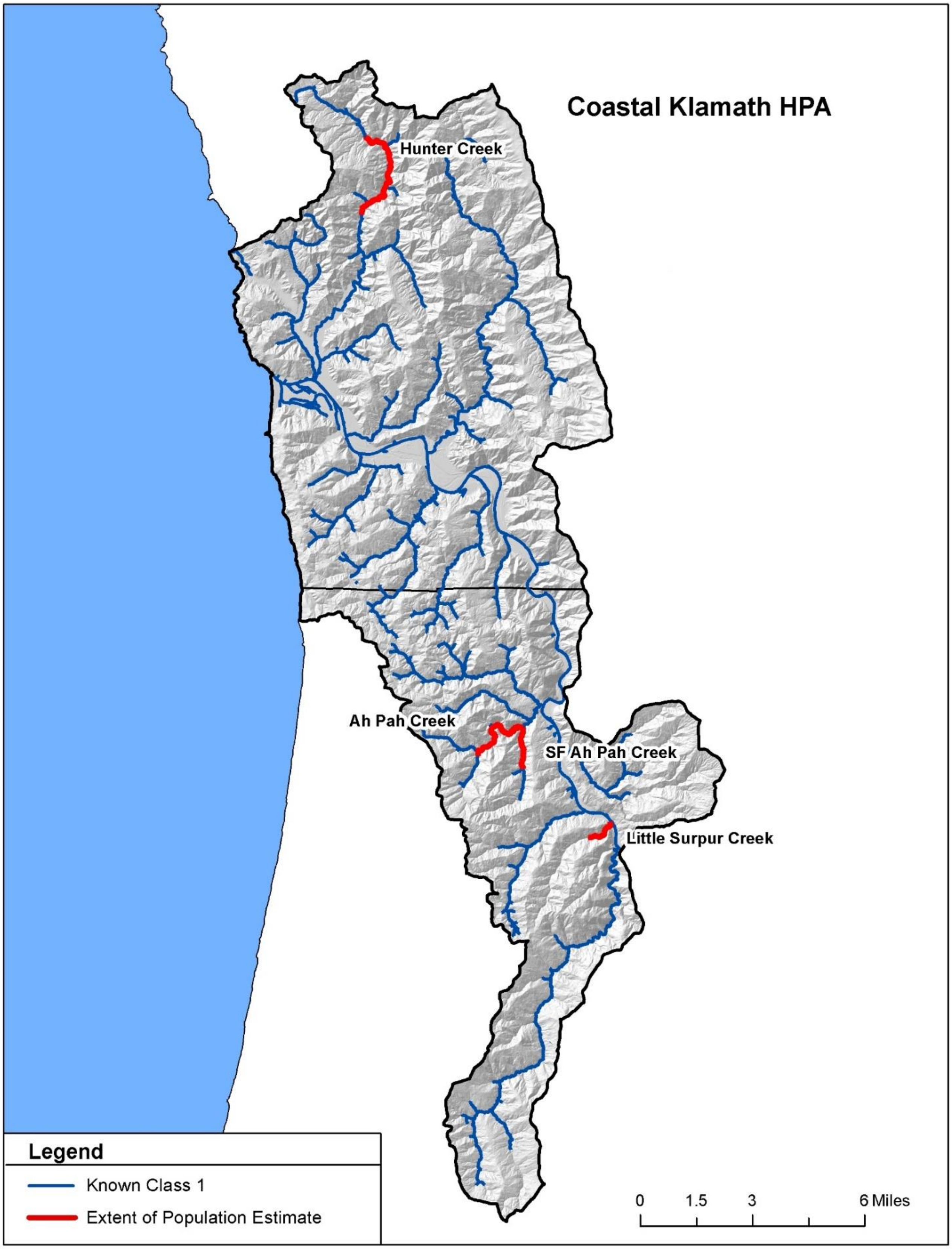
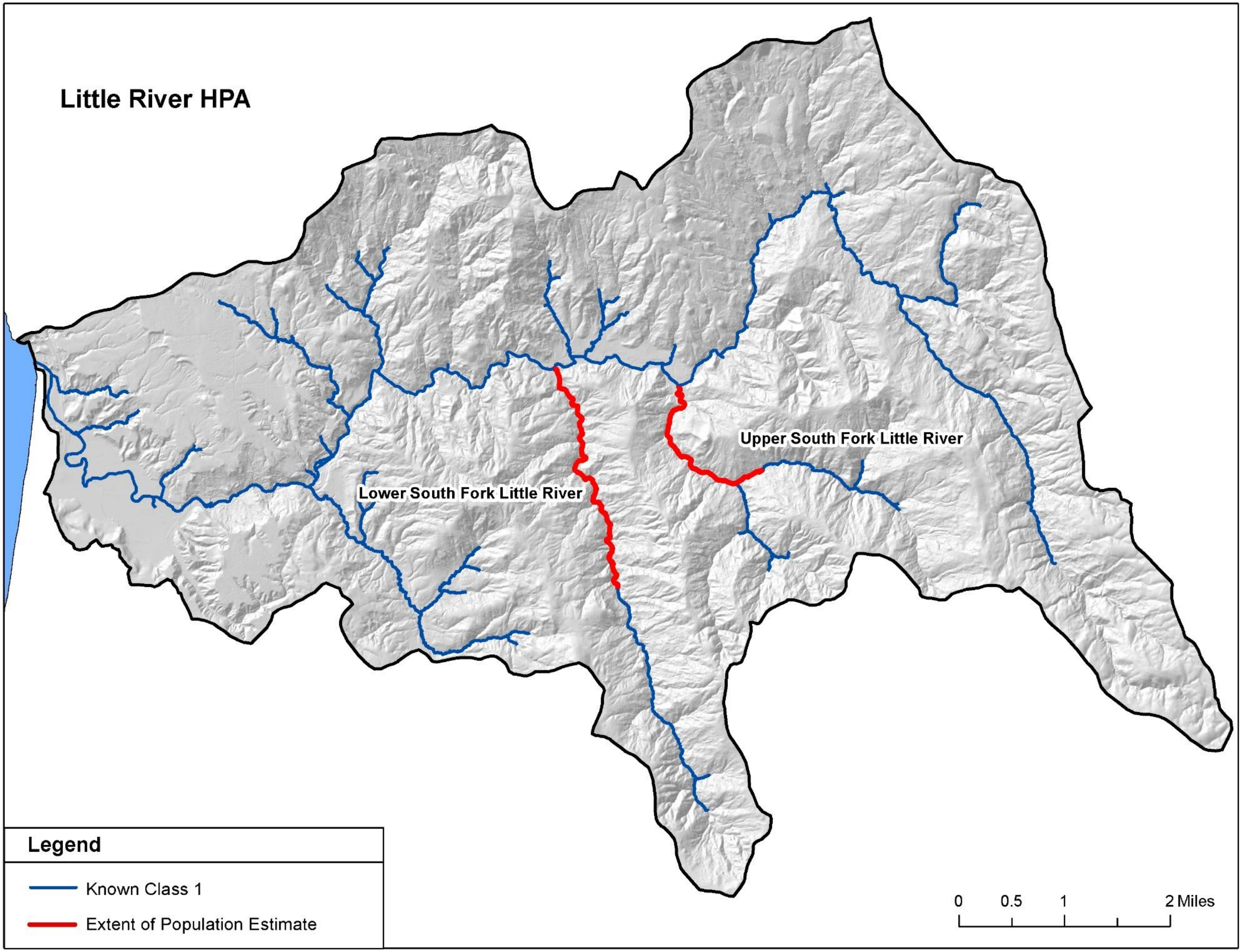
Appendices

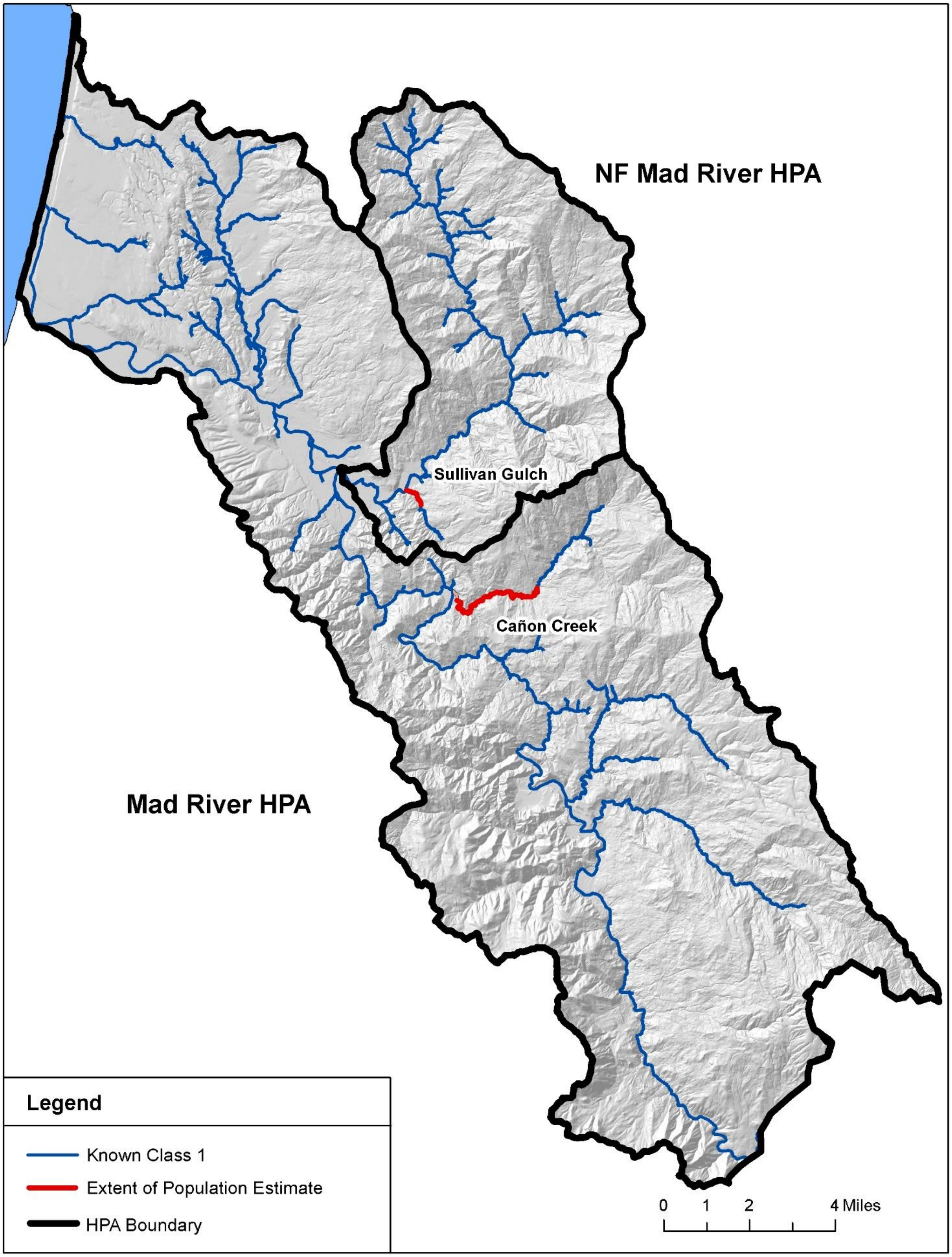
Appendix 1. Maps showing the locations and extents of the sites monitored in 2024 to calculate summer juvenile salmonid population estimates. Sites were grouped by hydrographic planning area (HPA) and were ordered from north to south. The extent of each site was determined by evidence of coho anadromy and can vary in length from year to year.




Coastal Klamath HPA
Hunter Creek
Ah Pah Creek
SF Ah Pah Creek
Little Surpur Creek
Legend
Known Class 1
Extent of Population Estimate
0 1.5 3 6 Miles



Little River HPA
Lower South Fork Little River
Upper South Fork Little River
Legend
Known Class 1
Extent of Population Estimate
0 0.5 1 2 Miles


NF Mad River HPA
Sullivan Gulch
Cañon Creek
Mad River HPA
Legend
Known Class 1
Extent of Population Estimate
HPA Boundary
0 1 2 4 Miles

Appendix 2. Electrofishing equipment used by GDRCo fisheries staff during the 2024 summer juvenile population monitoring surveys.

During 2024, the GDRCo fisheries staff used two electrofishing units. Both electrofishers used were Smith-Root (Smith-Root Inc., Vancouver, WA) model LR-20B (serial #s: B24947 and B671241). The electrical input and output of these units as operated by GDRCo were as follows:

The Model LR-20B is a 400-watt electrofisher. It is capable of an output voltage of 50 to 990 volts. It was operated using DC current and 200 volts. The input from the 24-volt lithium-ion battery system at up to 5 amps is capable of an output of up to 200 watts. Electrofishing with this model is conducted to keep the wattage output at approximately 100 watts or less. This was accomplished by monitoring the audible output voltage indicator (beeper). The rate of beeping is scaled to the wattage output, and if the rate increased indicating the 100-watt threshold was being broken, steps were taken to eliminate this from happening.

As mentioned above, sampling occurred with the use of straight DC current. The switch from pulsed DC to straight DC follows the NMFS recommended “decision tree”. This method of sampling coupled with our experienced fisheries staff reduced the chances of causing fish mortality. GDRCo has adopted the Hankin and Mohr (2001) salmonid population estimate sample design as a means of estimating coho populations and minimizes the use of electrofishing equipment. This protocol relies heavily on making multiple dive passes on Phase II shallow pools with low density population ($\leq$20 target species) rather than electrofishing every Phase II shallow pool. Only selected riffles and Phase II shallow pools with high density population (>20 target species) are sampled by electrofishing.

Appendix 3. Summary of summer juvenile salmonid population estimates, and confidence intervals (CI) separated by habitat type for each monitoring site sampled from 1995-2024.

		Coho Salmon				Cutthroat Trout				Steelhead Trout			
		Deep Pools		Shallow Units		Deep Pools		Shallow Units		Deep Pools		Shallow Units	
Site Name	Year	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Ah Pah Creek	2007	378	238	1,542	380	22	6	217	106	80	22	367	201
	2008	265	90	3,001	642	5	4	212	111	17	15	443	157
	2009	323	186	1,525	433	5	5	501	310	40	8	380	112
	2010	218	210	440	212	43	27	645	409	49	14	202	87
	2011	890	675	696	223	50	28	371	275	200	85	302	220
	2012	447	393	983	274	64	40	292	122	80	14	284	94
	2013	250	139	1,557	634	66	16	583	217	77	38	462	188
	2014	14	13	125	74	135	77	571	249	53	15	158	57
	2015	0	0	135	126	8	0	436	148	22	8	91	76
	2016	107	94	889	186	41	13	285	121	61	33	245	53
	2017	76	72	168	99	9	9	100	86	84	30	338	165
	2018	204	244	54	46	18	22	222	100	56	53	500	198
	2019	6	8	81	51	4	3	151	57	20	6	475	111
	2020	2	4	0	0	113	130	279	110	63	56	412	155
	2021	56	46	490	235	63	22	234	120	75	24	456	184
	2022	260	205	1,530	927	42	34	318	133	12	10	260	183
	2023	154	220	341	162	10	15	376	366	108	72	1,078	286
	2024	0	0	62	58	36	25	355	177	33	24	254	91

* Hard count, not estimate.

^ Combination of estimates and hard count.

- Data unavailable.

† Calculated from the product of available variances.

Appendix 3. Continued.

		Coho Salmon				Cutthroat Trout				Steelhead Trout			
		Deep Pools		Shallow Units		Deep Pools		Shallow Units		Deep Pools		Shallow Units	
Site Name	Year	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Cañon Creek	1995	319*	-	1,322	699	0	-	0	0	146*	-	1,019	263
	1996	0	0	0	0	12	12	0	0	409	123	281^	119†
	1997	23*	0	21	35	0	-	0	0	72*	-	531^	239†
	1999	279	129	203	122	0	0	0	0	219	53	392	128
	2000	170	55	126	45	16	12	13	21	361	79	598	106
	2001	1,046	161	816	195	0	0	0	0	362	79	416	209
	2002	655	187	490	246	4	6	0	0	222	58	163	84
	2003	34	23	31	51	0	0	0	0	199	80	289	204
	2004	1,567	308	1,025	289	0	0	0	0	312	80	405	131
	2005	277	88	354	117	0	0	0	0	177	50	289	117
	2006	15	16	0	0	0	0	0	0	291	97	227	54
	2007	1,796	521	660	219	0	0	0	0	124	27	330	140
	2008	740	180	515	245	3	3	0	0	119	40	194	135
	2009	0	0	0	0	0	0	0	0	191	38	305	115
	2010	271	151	58	12	0	0	0	0	252	69	309	114
	2011	436	142	121	57	0	0	0	0	265	49	387	202
	2012	538	214	45	19	21	17	22	11	340	67	430	221
	2013	286	262	195	135	0	0	0	0	155	61	207	111
	2014	640	319	551	144	0	0	0	0	175	41	210	122
	2015	30	16	44	43	0	0	0	0	182	69	201	69
	2016	288	128	379	114	0	0	0	0	80	24	167	55
	2017	403	134	210	63	0	0	0	0	258	62	298	82
	2018	529	386	183	80	0	0	0	0	320	107	352	80
	2019	324	326	0	0	0	0	0	0	136	49	375	128
	2020	201	156	62	107	0	0	0	0	212	53	257	144
	2021	244	134	214	132	0	0	0	0	148	48	152	61
	2022	533	197	833	297	0	0	0	0	124	44	355	167
	2023	1,638	617	865	315	0	0	0	0	225	60	703	238
	2024	0	0	1*	-	0	0	0	0	113	33	435	181

* Hard count, not estimate.

^ Combination of estimates and hard count.

\- Data unavailable.

† Calculated from the product of available variances.

Appendix 3. Continued.

		Coho Salmon				Cutthroat Trout				Steelhead Trout			
		Deep Pools		Shallow Units		Deep Pools		Shallow Units		Deep Pools		Shallow Units	
Site Name	Year	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Hunter Creek	1998	331	134	82	88	0	0	18	30	1,101	421	839	303
	1999	0	0	0	0	0	0	0	0	128	44	754	134
	2000	0	0	0	0	35	26	10	15	902	319	1,268	382
	2001	148	84	847	264	0	0	29	34	302	95	1,138	313
	2002	1,231	362	1,327	355	4	6	137	101	286	90	712	193
	2003	518	224	1,104	298	8	9	83	101	248	82	948	258
	2004	150	40	163	94	12	8	232	124	338	62	764^	248[†]
	2005	3,196	1,346	2,743	750	9	6	117	94	249	54	734	187
	2006	466	217	239	191	218	54	5	3	218	54	395	114
	2007	3,075	1,181	1,457	376	4	6	0	0	289	86	945	306
	2008	1,918	763	779	304	2	3	18	16	80	31	163	80
	2009	694	360	963	543	85	47	312	168	830	385	1,555	496
	2010	152	86	84	22	23	14	54	46	223	63	327	89
	2011	1,074	556	702	431	154	96	218	102	628	249	1,006	611
	2012	243	156	67	68	12	7	75	51	306	172	839	602
	2013	218	161	213	121	20	13	159	81	533	255	561	149
	2014	2	3	0	0	6	6	23	13	189	98	316	119
	2015	35	22	79	38	23	12	42	20	337	127	281	110
	2016	24	18	26	24	10	8	8	9	106	50	94	41
	2017	11	9	0	0	26	18	8	10	402	109	256	160
	2018	34	38	8	10	85	40	110	57	233	143	298	149
	2019	29	16	41	43	25	26	78	53	93	74	262	158
	2020	0	0	0	0	27	10	155	148	266	103	659	257
	2021	0	0	0	0	176	101	310	157	460	182	545	200
	2022	400	133	556	124	15	15	164	179	368	133	610	250
	2023	0	0	0	0	149	44	151	44	439	137	594	264
	2024	0	0	0	0	88	41	155	126	180	110	442	434

* Hard count, not estimate.
^ Combination of estimates and hard count.
\- Data unavailable.
[†] Calculated from the product of available variances.

Appendix 3. Continued.

		Coho Salmon				Cutthroat Trout				Steelhead Trout			
		Deep Pools		Shallow Units		Deep Pools		Shallow Units		Deep Pools		Shallow Units	
Site Name	Year	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Lower SF Little River	1998	3,086	395	1,224	502	0	0	0	0	169	59	58	35
	1999	2,390	356	6,066	880	0	0	74	63	54	21	154	54
	2000	1,819	325	3,284	591	4	7	21	18	23	20	74	38
	2001	339	123	589	239	6	7	0	0	83	25	48	19
	2002	3,484	511	10,838	2,234	10	9	132	89	57	17	177	106
	2003	1,816	309	4,504	1,060	0	0	74	46	32	20	47	34
	2004	986	213	3,186	1,171	14	9	11	19	38	15	155	101
	2005	1,996	211	4,916	866	13	11	57	44	51	15	125	51
	2006	1,796	245	7,989	1,546	0	0	47	27	8	6	113	160
	2007	1,097	139	6,846	1,043	0	0	42	28	55	25	104	59
	2008	1,720	317	8,650	1,993	0	0	31	21	23	17	48	60
	2009	1,983	452	7,954	3,292	8	9	96	94	36	20	116	96
	2010	766	169	1,244	319	31	10	43	33	82	17	64	30
	2011	2,851	726	5,741	979	47	20	190	71	53	15	213	75
	2012	3,656	1,108	7,260	2,086	37	18	177	99	101	36	208	85
	2013	2,378	765	7,118	1,462	65	28	151	69	138	45	223	78
	2014	575	138	557	165	69	26	226	150	102	33	72	28
	2015	2,002	639	5,560	1,532	18	13	95	59	46	20	123	79
	2016	1,715	257	5,128	1,189	28	12	110	65	57	19	95	89
	2017	805	205	2,901	625	26	8	94	52	63	17	139	79
	2018	747	248	8,417	2,488	26	19	103	55	68	24	406	132
	2019	1,276	409	3,176	842	26	17	95	53	21	12	73	59
	2020	1,389	712	6,370	2,026	24	18	15	19	90	32	201	61
	2021	2,522	923	8,516	2,101	15	13	37	30	105	48	101	101
	2022	930	280	13,772	2,799	42	21	758	520	70	31	91	64
	2023	570	133	5,757	1,986	9	8	188	185	19	15	93	54
	2024	1,852	305	5,506	1,543	52	13	204	110	62	16	99	35

* Hard count, not estimate.

^ Combination of estimates and hard count.

- Data unavailable.

† Calculated from the product of available variances.

Appendix 3. Continued.

		Coho Salmon				Cutthroat Trout				Steelhead Trout			
		Deep Pools		Shallow Units		Deep Pools		Shallow Units		Deep Pools		Shallow Units	
Site Name	Year	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Little Surpur Creek	2011	-	-	105	72	-	-	136	45	-	-	24	17
	2012	13	4	34	26	0	0	87	86	0	0	60	64
	2013	0	-	33	21	0	0	66	45	0	-	106	121
	2014	0	0	0	0	2	0	162	100	0	0	23	25
	2015	-	-	0	0	-	-	104	116	-	-	42	36
	2016	0	0	35	56	3	2	19	35	1	0	54	33
	2017	0	0	28	26	2	0	129	30	0	0	25	30
	2018	0	0	12	4	1	0	231	403	2	0	25	13
	2019	0	-	11	11	3	-	118	100	0	-	26	32
	2020	-	-	0	0	-	-	33	13	-	-	6	0
	2021	-	-	-	-	-	-	-	-	-	-	-	-
	2022	-	-	27	14	-	-	107	101	-	-	48	29
	2023	-	-	25	25	-	-	57	29	-	-	0	0
	2024	-	-	0	0	-	-	22	9	-	-	21	10

* Hard count, not estimate.
^ Combination of estimates and hard count.
- Data unavailable.
† Calculated from the product of available variances.

Appendix 3. Continued.

		Coho Salmon				Cutthroat Trout				Steelhead Trout			
		Deep Pools		Shallow Units		Deep Pools		Shallow Units		Deep Pools		Shallow Units	
Site Name	Year	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
SF Ah Pah Creek	2007	-	-	331	272	-	-	39	31	-	-	109	41
	2008	0	-	273	93	6	-	39	17	0	-	79	36
	2009	0	-	106	102	0	-	178	142	3	-	56	34
	2010	0	-	141	29	0	-	134	98	5	-	90	24
	2011	0	-	145	45	2	-	125	177	6	-	128	38
	2012	0	-	61	71	1	-	290	234	0	-	24	11
	2013	0	-	4	4	1	-	159	91	2	-	105	38
	2014	-	-	0	-	-	-	148	205	-	-	86	49
	2015	-	-	15^	23†	-	-	120	81	-	-	15	11
	2016	0	-	84	53	0	-	67	72	1	-	2*	-
	2017	0	-	0	0	2	-	175	77	0	-	18	13
	2018	0	-	133	121	0	-	107	97	4	-	238	125
	2019	0	-	0	0	1	-	105	200	2	-	266	61
	2020	-	-	0	0	-	-	144	87	-	-	82	38
	2021	-	-	0	0	-	-	128	32	-	-	48	33
	2022	-	-	64	47	-	-	87	70	-	-	108	73
	2023	-	-	94	88	-	-	87	133	-	-	123	63
	2024	0	0	0	0	3	0	163	68	0	0	46	24

* Hard count, not estimate.

^ Combination of estimates and hard count.

- Data unavailable.

† Calculated from the product of available variances.

Appendix 3. Continued.

Site Name	Year	Coho Salmon				Cutthroat Trout				Steelhead Trout			
		Deep Pools		Shallow Units		Deep Pools		Shallow Units		Deep Pools		Shallow Units	
		Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
SF Rowdy / Savoy Creeks	2001	156	95	510	166	13	10	110	68	163	51	598	129
	2002	105	79	603	153	12	11	245	117	43	17	593	226
	2003	0	0	0	0	0	0	52	50	7	11	323	187
	2004	4	-	267	147	4	-	143	83	10	-	393	121
	2005	492	363	1,058	408	11	11	108	51	41	21	645	125
	2006	0	0	18	8	13	13	75	45	52	14	387	144
	2007	30	9	120	37	22	9	41	45	73	17	732	344
	2008	3	4	205	55	10	0	136	101	31	4	640	348
	2009	0	-	0	0	2	-	330	150	25	-	1,004	365
	2010	0	-	2	4	4	-	105	75	24	-	1,138	560
	2011	0	0	0	0	15	9	121	73	59	55	875	351
	2012	0	0	0	0	12	10	103	59	9	15	177	89
	2013	0	0	0	0	23	8	98	76	79	25	549	215
	2014	3	4	0	0	12	7	100	76	67	14	304	107
	2015	0	0	0	0	7	6	0	0	38	39	135	150
	2016	0	0	0	0	5	3	4	4	84	42	194	163
	2017	0	0	0	0	0	0	34	54	35	19	445	327
	2018	0	0	0	0	8	6	46	23	21	16	261	176
	2019	-	-	0	0	-	-	64	69	0	0	908	595
	2020	-	-	0	0	-	-	2	4	-	-	394	155
	2021	-	-	21	29	-	-	212	178	-	-	1,002	452
	2022	-	-	0	0	-	-	190	141	-	-	864	454
	2023	0	-	0	0	8	-	133	95	23	-	991	333
	2024	0	0	0	0	5	5	210	226	43	24	1,468	959

* Hard count, not estimate.
^ Combination of estimates and hard count.
- Data unavailable.
† Calculated from the product of available variances.

Appendix 3. Continued.

		Coho Salmon				Cutthroat Trout				Steelhead Trout			
		Deep Pools		Shallow Units		Deep Pools		Shallow Units		Deep Pools		Shallow Units	
Site Name	Year	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
SF Winchuck River	1995	23*	-	32	47	29*	-	188	115	178*	-	1,149	501
	1996	28	21	4*	-	276	54	184	102	1,085	156	803	266
	1997	156*	-	317	140	56*	-	133	92	237*	-	619	280
	1998	33	7	0	0	261	71	191	92	1,480	224	1,067	260
	1999	0	0	0	0	110	32	255	65	325	76	756	102
	2000	0	0	0	0	154	50	479	214	1,291	232	1,809	361
	2001	7	8	13	23	257	50	378	90	1,041	135	1,392	200
	2002	392	87	656	148	136	39	328	142	660	136	677	160
	2003	62	38	126	87	208	36	435	91	637	115	1,042	222
	2004	2	3	8	4	62	21	309	74	121	39	777	136
	2005	220	95	589	181	123	50	597	163	344	42	1,300	229
	2006	2	2	8	14	171	41	474	180	272	58	976	298
	2007	115	54	294	76	149	38	284	77	280	60	622	135
	2008	107	51	77	38	212	35	395	182	636	95	600	142
	2009	2	3	0	0	195	48	388	183	292	42	776	206
	2010	41	26	22	15	251	47	624	176	603	95	1,363	259
	2011	13	14	5	3	195	24	673	273	664	88	1,476	298
	2012	2	3	0	0	189	31	314	156	199	61	676	303
	2013	0	0	0	0	307	106	288	213	1,263	386	687	227
	2014	311	179	92	81	297	47	460	192	680	148	1,051	272
	2015	2	2	0	0	84	21	292	100	264	78	663	185
	2016	0	0	0	0	83	34	186	98	311	35	748	142
	2017	0	0	0	0	156	29	308	80	611	104	983	230
	2018	76	72	84	52	151	45	368	107	490	169	1,099	242
	2019	2	2	0	0	67	20	170	98	602	161	951	240
	2020	88	50	220	100	67	24	283	119	199	51	830	191
	2021	3	5	415	239	42	18	209	121	335	127	1,072	328
	2022	8	9	2	4	68	18	316	133	360	87	1,561	494
	2023	208	197	124	88	209	50	520	264	1,492	440	2,160	1,256
	2024	224	86	368	113	188	35	746	426	564	144	1,513	409

* Hard count, not estimate.

^ Combination of estimates and hard count.

\- Data unavailable.

† Calculated from the product of available variances.

Appendix 3. Continued.

		Coho Salmon				Cutthroat Trout				Steelhead Trout			
		Deep Pools		Shallow Units		Deep Pools		Shallow Units		Deep Pools		Shallow Units	
Site Name	Year	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Sullivan Gulch	1999	168	37	627	287	0	0	0	0	9	4	5	7
	2000	13	-	42	40	0	-	0	0	4	-	60	29
	2001	23	-	843	387	0	-	0	0	2	-	73	59
	2002	151	-	2,429	454	0	-	0	0	4	-	6	10
	2003	88	84	1,343	590	0	0	0	0	3	3	19	17
	2004	28	-	1,084	309	0	-	0	0	3	-	40	24
	2005	26	-	394	114	0	-	0	0	0	-	37	29
	2006	-	-	393	154	-	-	0	0	-	-	6	11
	2007	27	-	1,100	587	0	-	0	0	0	-	10	12
	2008	6	-	1,246	985	0	-	0	0	0	-	16	20
	2009	0	-	50	29	0	-	0	0	2	-	27	17
	2010	0	0	0	0	0	0	0	0	5	3	0	0
	2011	77	-	198	98	0	-	0	0	0	-	6	5
	2012	2	-	0	0	0	-	0	0	0	-	6	8
	2013	2	-	0	0	0	-	0	0	0	-	7	10
	2014	0	-	39	22	0	-	0	0	0	-	2	3
	2015	0	-	4	4	0	-	0	0	0	-	4	5
	2016	12	2	21	20	0	0	0	0	1	0	7	13
	2017	5	-	89	32	0	-	0	0	3	-	50	54
	2018	2	-	27	29	0	-	0	0	0	-	0	0
	2019	22	4	28	43	0	0	0	0	4	3	0	0
	2020	29	4	133	42	0	0	0	0	7	3	12	5
	2021	0	0	97	26	0	0	0	0	0	0	12	8
	2022	65	-	1,005	504	0	0	0	0	0	0	2	3
	2023	-	-	697	296	-	-	0	0	-	-	6	7
	2024	25	0	594	147	0	0	0	0	1	0	4	7

* Hard count, not estimate.

^ Combination of estimates and hard count.

- Data unavailable.

† Calculated from the product of available variances.

Appendix 3. Continued.

		Coho Salmon				Cutthroat Trout				Steelhead Trout			
		Deep Pools		Shallow Units		Deep Pools		Shallow Units		Deep Pools		Shallow Units	
Site Name	Year	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Upper SF Little River	1998	303	117	517	230	21	29	4	5	108	30	208	64
	1999	257	193	1022^	489†	0	0	91	74	47	12	210^	73†
	2000	106	134	283	86	0	0	13	13	24	43	232	54
	2001	40	42	157	59	2	2	0	0	136	50	150	76
	2002	973	498	7,302	1,510	0	0	37	37	31	18	198	92
	2003	613	230	2,405	592	4	6	92	79	20	15	308	230
	2004	257	107	881	218	0	0	24	33	48	14	251	115
	2005	359	157	1,523	370	10	4	52	35	49	19	231	91
	2006	711	222	2,534	640	8	7	54	49	12	12	119	72
	2007	574	197	1,086	308	0	0	4	8	20	13	229	241
	2008	657	290	5,330	2,101	0	0	54	53	17	12	78	61
	2009	1,019	311	2,482	541	2	2	68	103	48	19	312	155
	2010	128	72	289	191	53	15	168	87	59	26	247	198
	2011	720	241	2,194	546	20	9	185	99	42	16	209	83
	2012	748	362	1,925	605	47	23	221	75	44	19	147	86
	2013	73	86	695	422	42	19	205	74	57	29	121	77
	2014	19	21	356	79	45	27	155	54	24	12	99	64
	2015	402	195	1,328	432	18	12	66	69	79	27	102	25
	2016	103	61	854	308	42	21	185	138	38	14	213	73
	2017	245	97	660	274	30	12	126	103	43	12	318	223
	2018	433	186	1,803	531	13	11	143	88	17	15	224	131
	2019	291	176	1,250	340	23	32	118	53	34	19	201	73
	2020	241	141	755	195	21	9	21	11	47	22	174	66
	2021	346	294	2,657	842	13	8	34	38	14	8	167	71
	2022	502	283	3,689	2,138	33	19	298	204	42	12	181	74
	2023	749	314	4,369	1,773	20	9	268	155	42	17	388	133
	2024	615	188	2,064	408	12	8	182	68	36	20	413	153

* Hard count, not estimate.
^ Combination of estimates and hard count.
\- Data unavailable.
† Calculated from the product of available variances.

Appendix 3. Continued.

		Coho Salmon				Cutthroat Trout				Steelhead Trout			
		Deep Pools		Shallow Units		Deep Pools		Shallow Units		Deep Pools		Shallow Units	
Site Name	Year	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Wilson Creek	1995	237*	-	1,310	288	0	-	0	0	187*	-	908	302
	1996	442	159	173	158	136	57	6	19	1,086	247	1,093	383
	1997	248*	-	27*	-	0	-	0	0	125*	-	300^	76†
	1998	404	133	28	26	52	80	3	4	971	207	530	128
	1999	0	0	21	34	0	0	0	0	337	160	399	121
	2000	21	18	21	22	15	15	0	0	380	164	927	180
	2001	188	117	315	111	2	2	12	17	1,882	1,419	1,086	189
	2002	247	170	1,489	408	17	16	17	23	96	44	758	312
	2003	1,077	287	904	292	15	13	0	0	228	68	426	173
	2004	359	122	253	130	0	0	0	0	147	48	390	242
	2005	1,524	369	2,077	492	0	0	2*	-	230	86	535	152
	2006	204	55	347	136	4	6	0	0	318	136	465	148
	2007	3,023	783	1,836	385	5	4	0	0	184	63	306	140
	2008	3,928	851	6,918	2,008	0	0	4	7	85	27	463	163
	2009	0	0	0	0	13	7	17	19	82	30	758	533
	2010	705	389	1,138	516	11	10	0	0	390	141	1,210	512
	2011	2,938	1,035	4,835	1,565	30	15	31	16	465	75	1,397	347
	2012	72	32	108	24	50	22	26	11	678	222	358	303
	2013	457	156	519	329	31	15	40	28	600	194	660	395
	2014	797	396	571	338	15	16	15	21	202	69	288	173
	2015	17	17	0	0	11	13	0	0	708	238	552	270
	2016	1,792	582	1,616	785	7	7	0	0	239	77	474	237
	2017	1,075	225	1,042	364	36	17	4*	-	689	169	634	210
	2018	82	45	191	74	43	19	11	12	1,306	461	1,808	908
	2019	1,288	597	198	182	14	12	10	11	314	99	294	123
	2020	169	82	349	267	40	23	8	9	300	124	338	211
	2021	92	55	118	87	41	21	42	46	326	122	461	202
	2022	2,490	972	2,447	861	12	13	24	30	508	243	897	404
	2023	504	236	502	326	0	0	0	0	202	107	324	173
	2024	180	98	160	74	25	23	22	19	603	273	1,163	294

* Hard count, not estimate.

^ Combination of estimates and hard count.

- Data unavailable.

† Calculated from the product of available variances.

Appendix D

Juvenile Salmonid Outmigrant Trapping Program

Little River Annual Report

2024

Green Diamond Resource Company's Annual Report

To

National Marine Fisheries Service

For

Permit 17351-2R

Juvenile Salmonid Outmigrant Trapping Program

Little River

2024

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Submitted January 2025

Introduction

In 2024, Green Diamond Resource Company (GDRCo) conducted its tenth year of outmigrant smolt monitoring in mainstem Little River, under a National Marine Fisheries Service (NMFS) Section 10 Permit (17351-2R). The outmigrant smolt monitoring project has been conducted in the Little River watershed since 1999 and in 2007 became part of the Effectiveness Monitoring Program under an approved Aquatic Habitat Conservation Plan (AHCP, (GDRCo 2006)). The purpose of the Effectiveness Monitoring Program is to track the success of the AHCP conservation program in relation to the biological goals and objectives and provide a basis for adaptive management.

The Little River watershed is in Humboldt County, California and provides habitat for ESA listed salmonids from the Southern Oregon/North Coastal California (SONCC) coho salmon evolutionarily significant unit (ESU), California Coastal Chinook salmon ESU, and Northern California steelhead distinct population segment (DPS). The objectives of the outmigrant trapping project in the Little River watershed are to monitor the abundance, size and timing of emigrating salmonid smolts for these species and coastal cutthroat trout. Juvenile outmigrant trapping helps to identify factors affecting outmigration timing and establishes a baseline and long-term trend data on the abundance of juvenile salmonid populations.

From 1999-2022, GDRCo conducted outmigrant trapping in three to four major tributaries of Little River: Upper South Fork (USFLR), Lower South Fork (LSFLR), Railroad Creek (RRC) and Carson Creek (CC). In 2014, GDRCo, with approval from the U.S. Fish and Wildlife Service and NMFS (Services), discontinued trapping at the Railroad Creek site. From 2015-2024, GDRCo has conducted outmigrant trapping at the mainstem Little River site (MSLR). In 2024, GDRCo proposed to the Services to discontinue trapping in the three remaining tributary sites in Little River. This was based on the belief that the estimates were not a reliable source of tributary smolt production. After 23 years of tributary trapping there was not a clear relationship between young of the year estimates and the following year's smolt estimates. This is likely related primarily to early emigration from and carrying capacity of the tributaries. The Services agreed that the discontinuation of tributary trapping in Little River would be beneficial for the species. GDRCo plans to continue outmigrant trapping at MSLR to estimate smolt production within Little River.

Outmigrant trapping was conducted at MSLR from March 19th through June 28th, 2024. This document reports findings for the 2024 season and makes comparisons to past monitoring in Little River.

Methods

Study Site

Outmigrant trapping was conducted using a rotary screw trap at one site on the Mainstem of Little River (MSLR, ≈ 40.35 mi^2) (Figure 1). There is approximately 21.4 miles of mainstem and 8.5 miles of tributary coho habitat above this site. However, the amount of habitat above this monitoring site varies from year to year, as a result of dynamic stream processes. MSLR was established in 2015 at approximately river mile three. This site is located within the Little River hydrographic planning area (HPA, (GDRCo 2006)) which is predominantly owned by GDRCo.

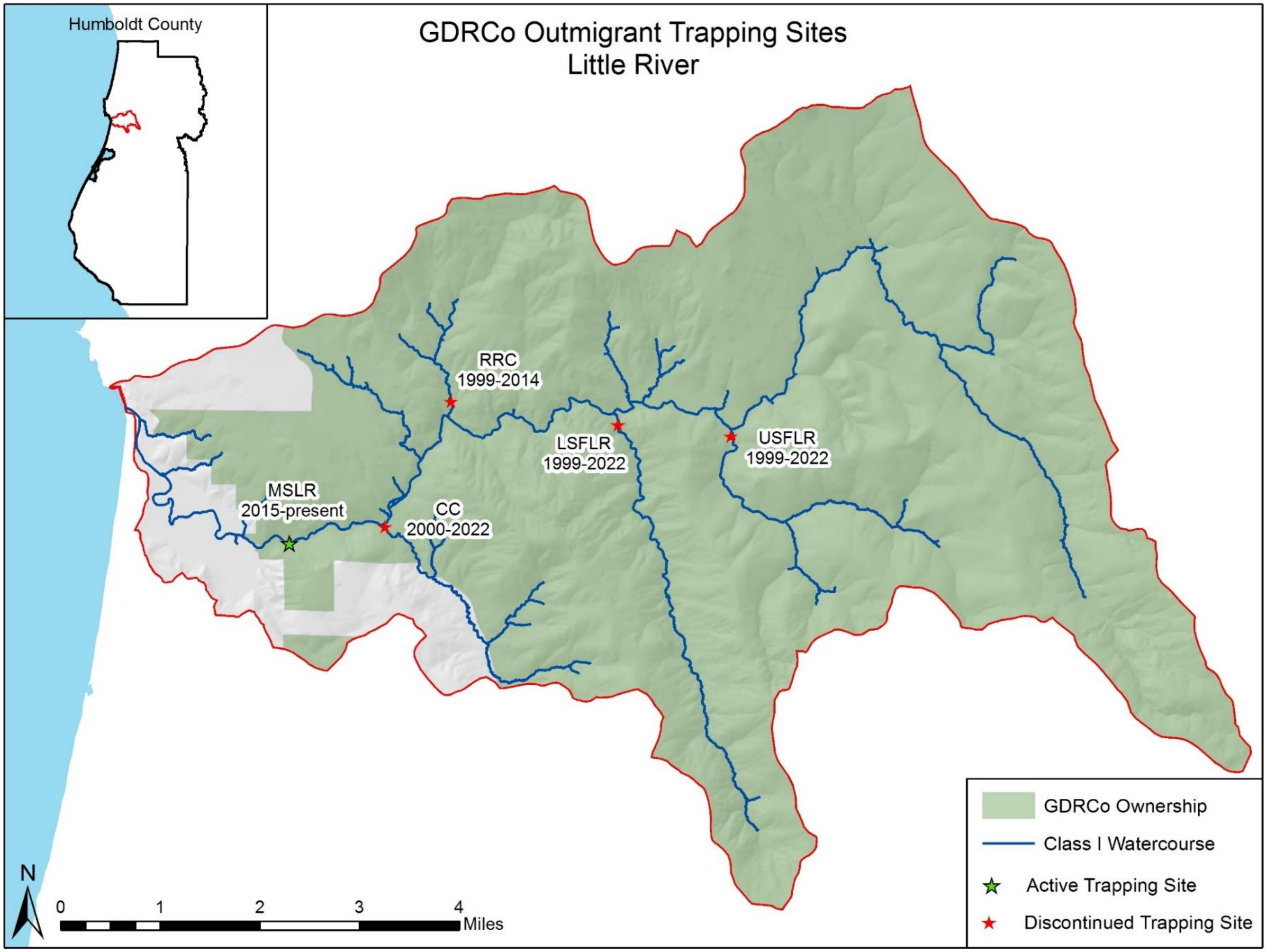

Figure 1. Location of current and discontinued outmigrant trapping sites in the Little River Hydrographic Planning Area, Humboldt County, California.

Outmigrant Trapping

A rotary screw trap (RST) was the only method of outmigrant trapping used for monitoring in Little River during 2024. The RST (cone diameter = 1.5 m) is made up of six general components; a screened cone, two pontoons, cross members, two live-boxes, an A-frame and rails. The trap was positioned in the creek with the opening of the cone facing upstream and was located at the head of a pool, utilizing the upstream riffle to spin the cone. Under low flows, sandbags and rocks were installed upstream (Figure 2) from the trap opening to help guide out-migrating fish into the trap and capture more water to increase cone rotation. Rotations per minute (RPM) were calculated and recorded during site visits. Fish entering the cone were guided by an auger inside the cone into the front live-box (dimensions = 56" L X 40" W X 20" D) at the rear of the cone. An additional back live-box (dimensions = 36" L X 40" W X 20" D) was added to increase the capacity of the trap. Screened openings (mesh opening size =1/2", set diagonally) were provided in the sides or back of the live-boxes to minimize the predation potential by allowing smaller fish to exit the live-boxes. Artificial cover was placed in both live-boxes to help minimize predation potential of young of year (YOY) fish. The cover consisted of artificial plants anchored in a concrete base and positioned in the corners of the trap boxes and were used to provide refuge for juveniles.

The outmigrant trap was operated 24 hours a day, 7 days a week during suitable flow conditions and checked at least daily. During larger storm events (> approximately 500 cfs), trapping was suspended to prevent fish mortality and equipment damage. Juvenile salmonid mortality has been associated with large capture numbers and debris loading in the trap-box during periods of high winds and high flows (GDRCo 2011). Therefore, during periods when significant numbers of outmigrants were captured or when accumulations of debris were likely (e.g. during moderate-high winds), the trap was checked more than once per day, as necessary.

The data collecting and handling procedures for captured fish varied depending on species and age class. Each day, all captured fish were at least identified, aged, and enumerated. Due to the similarities between YOY steelhead and YOY cutthroat trout (fork length <90 mm), proper identification is problematic (Baumsteiger et al. 2005, Voight et al. 2008) therefore, these species were categorized as "trout". All "trout" were categorized as YOY fish. Steelhead and cutthroat trout in the 1+ or older age classes are more readily distinguishable and were categorized to species. Adult cutthroat were defined as fish >200 mm with little to no signs of smoltification. Each species of YOY salmonids was counted each day. Among the 1+ fish and adult cutthroat captured each day, the first 5 fish of each species were measured and weighed at each site. Adult cutthroat were measured when feasible but not weighed. After processing and handling, unmarked fish were released approximately 150 meters downstream from the trap site, below three riffles and a split channel to minimize recapture. Each day a sub-sample of smolts were marked and released upstream of the trap to estimate trapping efficiency (see below for details). Prior to marking, fish were identified, anesthetized with Alka-Seltzer Gold®, weighed, and measured. After recovery, marked fish were released 4 pools upstream, approximately 330 meters, to allow for equal mixing with the unmarked population to assist with more accurate estimates of capture probability. Adult steelhead were enumerated, sexed and released immediately at the trap site.

Figure 2. Photo showing the trapping method, RST used for outmigrant trapping in Little River, Humboldt County, California.

Trap Efficiency

Trap efficiency was calculated only for species that were actively leaving the watershed on their seaward migration (i.e., smolts). Smolts were identified using distinct morphological characteristics including; fading parr marks, scale color transition towards silver, and fins turning clear with dark tips. At MSLR, four different caudal fin clips were used as marks throughout the trapping effort on a seven-day rotating period: upper horizontal, upper vertical, lower vertical, and lower horizontal. After the first twenty-eight days, the same sequence of clips was repeated. Up to 20 smolts of each species were marked every day for trap efficiency quantification.

Marked fish were allowed to recover in a perforated live-box which was located four pool habitats upstream of the trap site. The live-box had an automatic release device which was programmed to release fish 10 hours following capture. This delayed release allowed fish ample recovery time and provided cover (i.e., darkness) during their release to minimize predation. Recaptured fish were released downstream (~150 meters) from the trap site to avoid pseudoreplication in calculations of capture probabilities.

Population Estimates

All outmigrant salmonid smolt population estimates were calculated using the Darroch Analysis with Rank Reduction (DARR 2.0.1 software) for analysis of stratified mark-recapture data (Bjorkstedt 2005).

While all historical data have been audited for accuracy and consistency as for this report, GDRCo maintains and periodically updates a data quality routine that may detect previously unidentified errors. Estimates presented in this report that differ from previously reported figures should be considered the most accurate.

Stream Temperature

Water temperature was monitored at the trap site during the 2024 trapping season and the data was used to document the water temperatures trapped fish were exposed to during the monitoring season (Figures 9 and 10). Water temperature was measured using HOBO® Water Temp Pro v^2 data logger (Onset Computer Corporation, Bourne, MA). On the rotary screw trap, the data logger was attached directly to the frame of the live-box. The logger recorded water temperature (ºC) on a 72-minute interval.

Results

Trapping Effort

The 2024 trapping effort was summarized and compiled with all other years to allow for comparison over the history of outmigrant trapping at the mainstem Little River site (Table 1). In 2024, the outmigrant trap was in operation for 89% of the trapping season. The overall mean of operable days across all years at the MSLR site is 95.2%. For the mainstem RST, the initiation of trapping on March 19th was 3 days earlier than the mean initiation date of March 22nd. Cone revolutions per minute (rpms) of the RST were counted for 100% of trapping days (average = 6.6 rpm, range = 5-11).

Table 1. Summary of the 2015 – 2024 outmigrant trapping (OMT) seasons conducted by GDRCo at MSLR in the Little River watershed, Humboldt County, California.

	Year											
OMT parameter	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**Mean**	**Total**
Initiation date	28-Mar	2-Apr	22-Apr	31-Mar	14-Mar	28-Feb	16-Mar	23-Feb	6-Apr	19-Mar	22-Mar	-
Completion date	19-Jun	24-Jun	30-Jun	29-Jun	5-Jul	26-Jun	25-Jun	1-Jul	14-Jul	28-Jun	29-Jun	-
Season days	84	84	70	91	114	120	102	129	100	102	99.6	996
Operable days	82	84	69	80	106	114	102	118	99	91	94.5	945
Operable %	98%	100%	99%	88%	93%	95%	100%	91%	99%	89%	95.2%	-
Inoperable days	2	0	1	11	8	9	0	10	1	11	5.3	53
Inoperable %	2%	0%	1%	12%	7%	8%	0%	8%	1%	11%	5.0%	-

Trap Efficiency

Trapping efficiencies (i.e., capture probability) were calculated for all smolts at MSLR and varied throughout the season. The changes in trapping efficiency for coho are represented in Figure 3. The overall mean trap efficiency for coho smolts during the 2024 trapping season was 51% (Range = 23-77%). Compared to past years, average trap efficiency in 2024 was within the range previously documented (41 − 55%) in Little River.

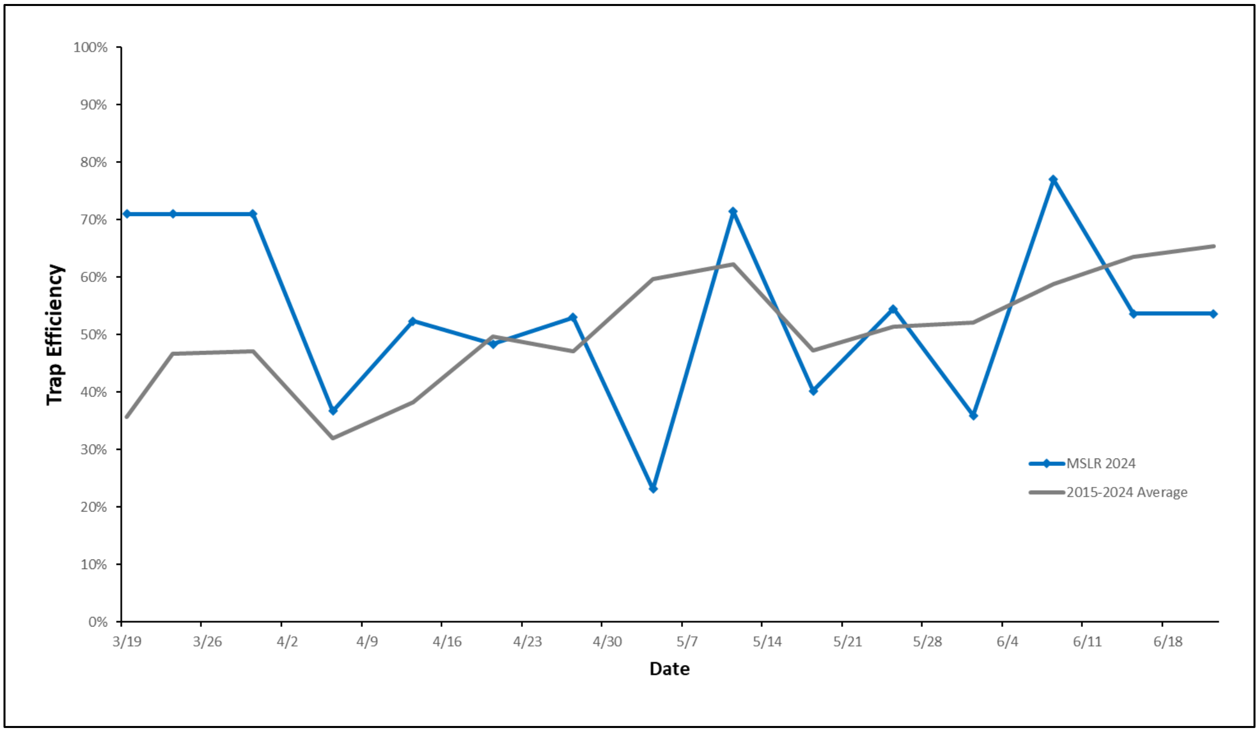

Figure 3. Summary of trap efficiencies for coho smolts during 2024 outmigrant trapping and the averages for 2015-2024 in Little River, Humboldt County, California.

Population Estimates

During the 2024 outmigrant trapping season, a total of 6,063 salmonid smolts were captured. The number of total captures including unmarked, marked and recaptured fish for each species were summarized (Table 2). Coho accounted for 94% of the total smolt captures. Among the individual salmonid smolts captured, excluding recaptures, 31% were marked; 28% of the coho smolts, 96% of the steelhead smolts and 100% of the cutthroat smolts. The relatively high proportion of marked steelhead and cutthroat resulted from small sample sizes. In 2024, smolt population estimates were calculated for all salmonids at MSLR (Table 3) and compared to the previous years' estimates (Figures 4-6).

Table 2. Summary of smolt captures including unmarked, marked and recaptured smolts during the 2024 outmigrant trapping season at the MSLR site in Little River, Humboldt County, California.

Species	Unmarked	Marked	Recaptured	Total Captured
Coho	3,604	1,377	698	5,679
Steelhead	9	246	87	342
Cutthroat	0	29	13	42

The 2024 coho estimate at MSLR was the fourth time this cohort (i.e., Figure 4, blue bar) was estimated. Compared to 2021, coho smolt estimates increased by approximately 65.7%. The 2024 coho estimate was above average for MSLR (mean = 9,193) and the 4th highest coho estimate on record.

Table 3. Smolt population estimates and confidence intervals (UCI = upper and LCI = lower) at MSLR from 2015 to 2024 in the Little River watershed, Humboldt County, California. Note, when UCI and LCI are not equal, the LCI is the hard count of observations*.

Species	Year	Estimate	95% UCI	95% LCI
Coho	2015	2,557	90	90
	2016	5,036	266	266
	2017	8,195	859	859
	2018	5,056	692	692
	2019	9,609	1,161	1,161
	2020	13,441	1,456	1,456
	2021	6,164	445	445
	2022	17,843	1,325	1,325
	2023	13,813	907	907
	2024	10,216	757	757
Steelhead	2015	1,129	123	123
	2016	723	183	183
	2017	338	249	249
	2018	868	202	202
	2019	1,249	396	396
	2020	1,065	357	357
	2021	824	369	369
	2022	1,364	573	573
	2023	234	66	66
	2024	1,332	882	882
Cutthroat	2015	46	35	35
	2016	65	30	30
	2017	20	33	15*
	2018	52	49	39*
	2019	93	55	55
	2020	8	7	4*
	2021	4	5	2*
	2022	74	64	55*
	2023	120	96	93*
	2024	65	24	24

Table 4. Summary of unmarked salmonids captured during the 2024 trapping season in the Little River watershed, Humboldt County, California.

Adult		YOY			1+	
Steelhead	Cutthroat	Coho	Chinook	Trout	Steelhead	Cutthroat
7	62	1	4	10	5,161	1,104

The estimate for steelhead smolts was the 2nd highest on record in 2024 (1,332) and was above the average for MSLR (mean = 913) (Figure 5). The estimate for cutthroat smolts was the 4th highest on record in 2024 (65) and was above the average for MSLR (mean = 55) (Figure 6).

Excluding smolts, a total of 6,349 salmonids were captured at MSLR during the 2024 trapping season. These captures were summarized by species and age class (Table 4). The numbers in this table are counts and not estimates. A majority (98.7%) of the captures were 1+ fish, followed by adults (1.1%) and 0+ fish (0.2%).

Counts of cutthroat 1+ and steelhead 1+ moving through the outmigrant trap from 2015-2024 are presented below (Figure 7). Trap efficiencies were not calculated for cutthroat 1+ and steelhead 1+. During the 2024 trapping season, a total of 1,104 cutthroat 1+ and 5,161 steelhead 1+ were captured at MSLR.

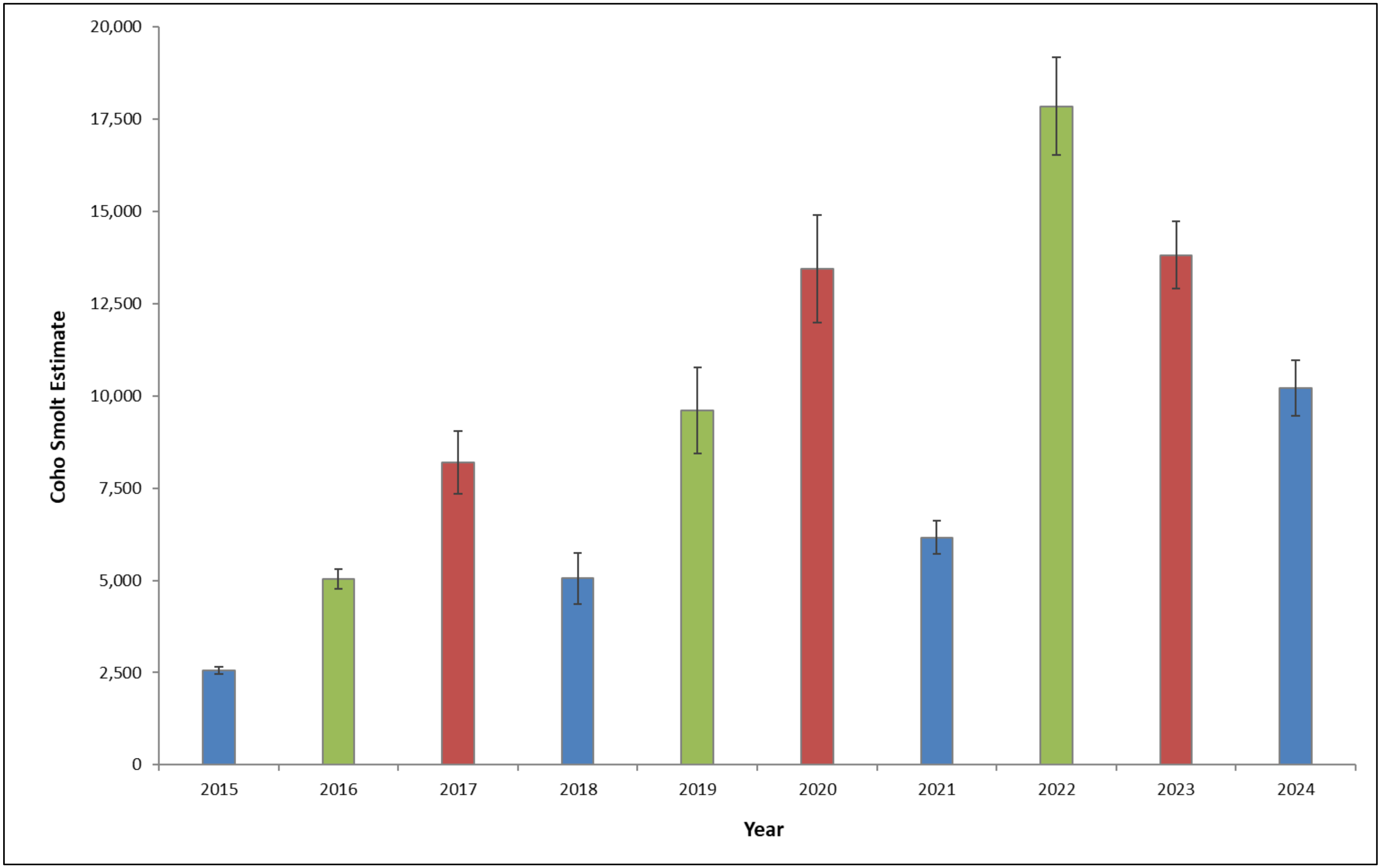

Figure 4. Outmigrant smolt estimates (with 95% CI) for coho salmon at Mainstem Little River, 2015-2024. Colored bars indicate three distinct cohorts.

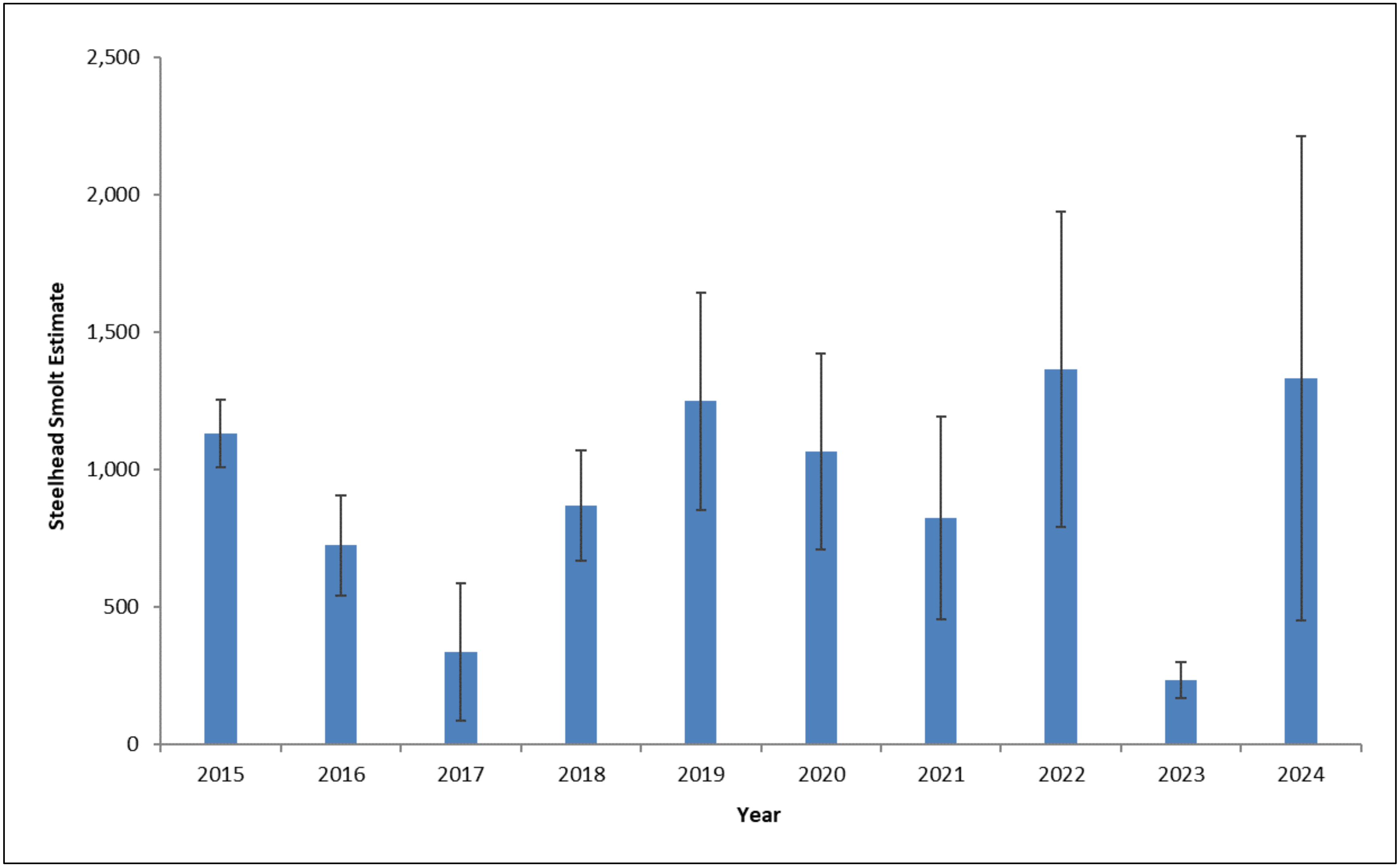

Figure 5. Outmigrant smolt estimates (with 95% CI) for steelhead trout at Mainstem Little River, 2015-2024. Note, 2017 and 2023 were the latest trap initiation dates of April 22nd and April 6th, respectively.

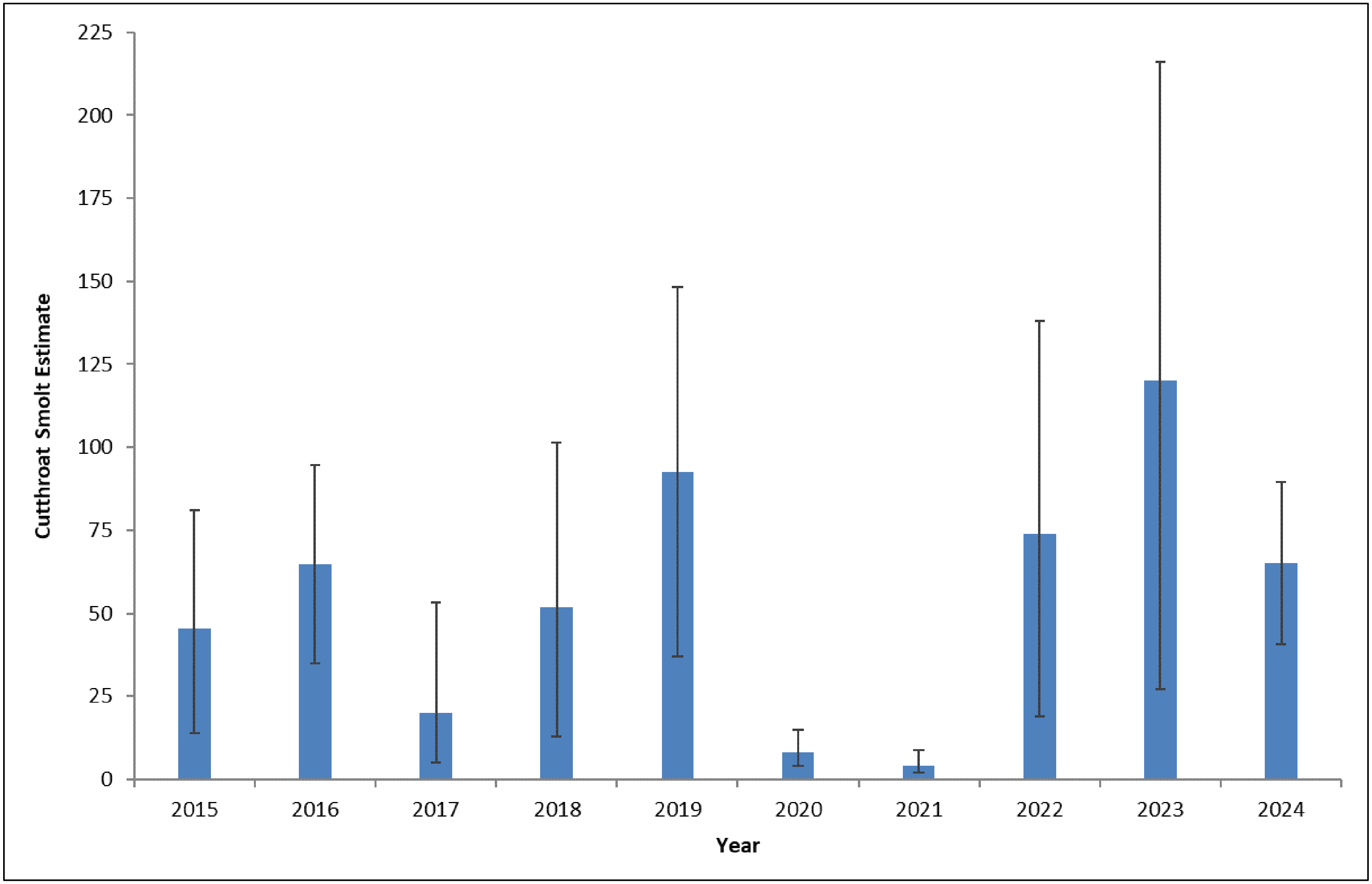

Figure 6. Outmigrant smolt estimates (with 95% CI) for cutthroat trout at Mainstem Little River, 2015-2024.

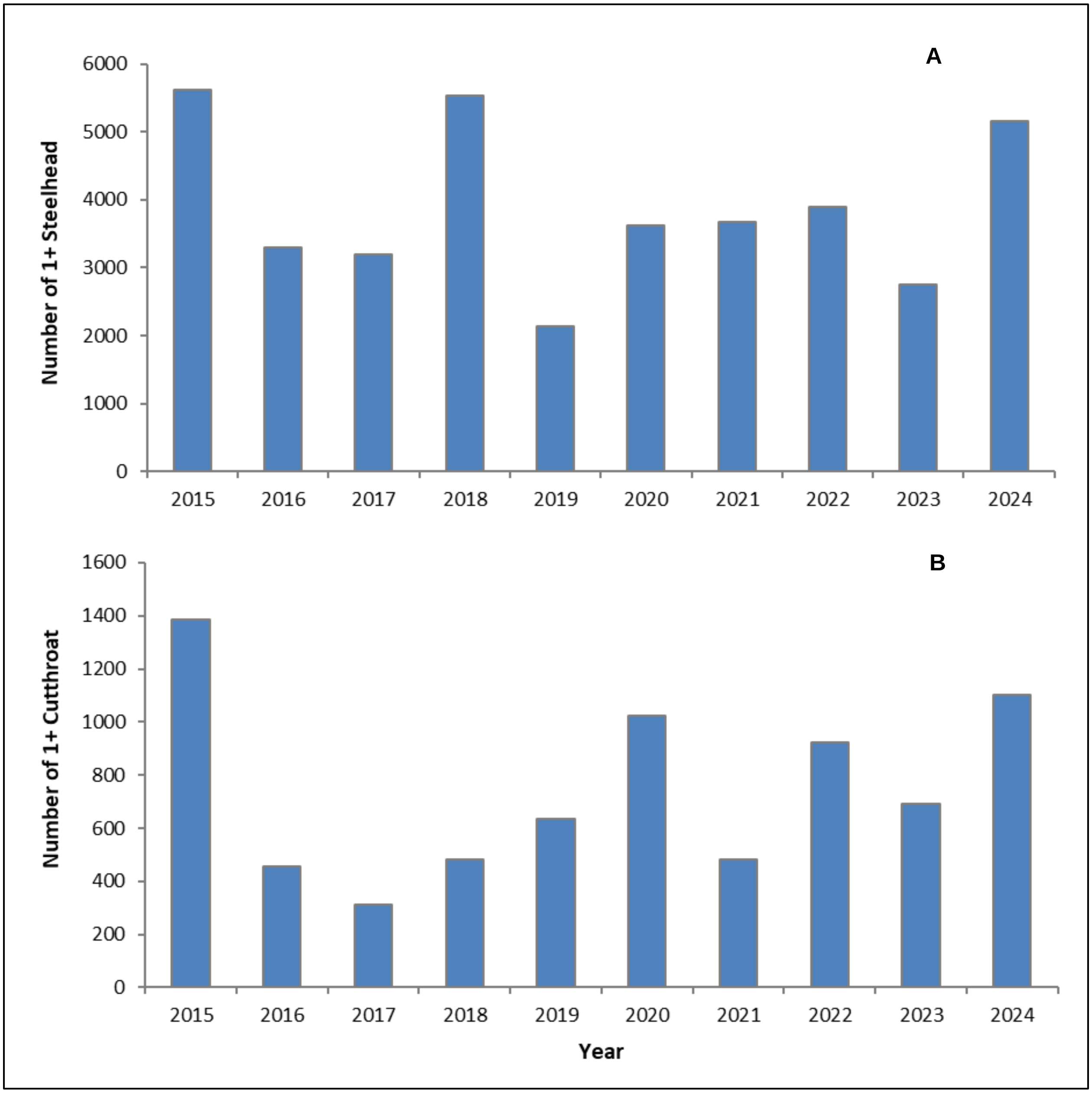

Figure 7. Frequency histogram of steelhead 1+ (A) and cutthroat 1+ (B) counted during outmigrant trapping from 2015-2024 in Little River, Humboldt County, California. Note the difference in the y-axis.

Size and Condition

A total of 2,536 fish were measured and weighed during the 2024 outmigrant trapping season. A summary of the measurements collected was compiled and statistics were calculated for each salmonid species and life history stage at MSLR (Table 5).

Based on a visual assessment of the 12,412 salmonids handled, the majority (99%) appeared to be in good condition and health. A total of 798 of those fish were handled a second time because they were recaptured smolts. One hundred and thirty-one fish (1%) were recorded as mortalities, injured or unhealthy. Among these fish, 10 were mortalities (Table 6), 104 had injuries (e.g., bruised, scraped, damaged tail or fins, bite marks), 7 were affected by black spot disease, 3 were affected by exopthalmia disease, 7 had a body deformity (2 in the spine, 3 in fin shape and 2 with a short operculum). Among the 104 fish that had injuries, 14 of those fish had bite scars that appeared to be from an adult lamprey.

The trapping season in 2024 was the second consecutive year where wounds from lamprey were observed. In 2023, there were 76 records of salmonids with lamprey wounds which were some of the first on record at MSLR. Efforts to reduce this type of predation were taken in 2024 with the implementation of artificial cover inside the live boxes. Artificial plants were attached to a small concrete base and were placed in the corners of the live boxes to reduce this type of predation (Figure 8). Captured adult lamprey were also taken to the downstream release site that is approximately 150 meters downstream. The total number of lamprey bite records was reduced from 76 in 2023 to 14 in 2024. The fish that sustained these types of injuries were coho smolts, steelhead 1+ and a steelhead smolt. On each of the days where a fish was recorded as injured from a lamprey, there was at least one adult lamprey also caught in the trap. It is uncertain if the reduction in lamprey bites was a direct result of the measures taken in 2024; however, GDRCo will continue to investigate solutions moving forward.

Figure 8. Photo of the artificial cover used in the live boxes during the 2024 trapping season in Little River, Humboldt County, California.

Table 5. Summary of length and weight for salmonids captured (N = sample size) during the 2024 outmigrant trapping season in Little River, Humboldt County, California.

			Fork Length (mm)		Weight (g)	
Species	**Age Class**	**N**	**Range**	**Mean**	**Range**	**Mean**
Coho	Smolt	1377	71-147	104	4.0-33.1	12.6
Steelhead	Smolt	246	139-230	166	23.4-116.5	42.5
Steelhead	1+	438	74-174	108	4.2-83.7	14.7
Cutthroat	Adult	61	200-350	257	N/A	N/A
Cutthroat	Smolt	29	159-248	188	35.7-144	64.4
Cutthroat	1+	385	95-198	147	9.5-120	32.7

Mortality

Overall, of the 12,412 captures of salmonids (including recaptures), the mortality rate was 0.08% (Table 6). A total of 6 dead coho were documented during the 2024 outmigrant trapping season at MSLR (Table 6). Those resulting from unknown causes or monitoring activities (n = 5) were reported as mortalities and those clearly from predation (n = 1) were reported separately. Mortalities were also observed for steelhead 1+ (n = 2), cutthroat 1+ (n = 1), trout 0+ (n = 1), pacific lamprey adult (n = 1) and sculpin (n = 3). Predation was observed for coho and steelhead 1+. More details on the cause(s) of the observed mortalities and efforts to minimize them are described in the discussion section.

Table 6. Summary of salmonid mortality during 2024 outmigrant trapping in Little River, Humboldt County, California.

			Mortality							
			Handling		Unknown*		Predation		Total	
Species	**Age Class**	**Captured (#)**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Coho	Smolt	5,679	0	0.00%	5	0.09%	1	0.02%	6	0.11%
Coho	YOY	1	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Coho	Adult	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Chinook	YOY	4	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Cutthroat	Adult	62	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Cutthroat	Smolt	42	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Cutthroat	1+	1,104	0	0.00%	1	0.09%	0	0.00%	1	0.09%
Steelhead	Adult	7	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Steelhead	Smolt	342	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Steelhead	1+	5,161	0	0.00%	1	0.02%	1	0.02%	2	0.04%
Trout	0+	10	0	0.00%	1	0.00%	0	0.00%	1	0.00%
Totals:		12,412	0	0.00%	8	0.06%	2	0.02%	10	0.08%

*mortality resulting from uknown causes (i.e., not predation)

Migration Timing

A frequency histogram was created using daily smolt captures (i.e., not estimates) to summarize the timing of coho smolt migration (Figure 9) and steelhead smolt migration (Figure 10) at MSLR. The outmigrant trap appeared to have been installed before the peak of the coho smolt outmigration. MSLR was initiated approximately three days earlier than the mean initiation date. MSLR coho smolt migration had two distinct peaks, the first peak was on May 15th and the second peak was on May 29th. The bulk of steelhead smolt captures occurred during April, peaking on April 15th. There were significant steelhead smolt captures within the first few days of trapping that could indicate the steelhead smolt migration commenced before trap initiation.

Stream Temperature

Water temperature was monitored for 102 days (March 19th- June 28th) at the MSLR trap site, during which a total of 2,040 measurements were collected. This monitoring period accounted for 100% of the 2024 outmigrant trapping season at MSLR. The minimum temperature recorded was 7.44 ºC and the maximum was 16.03 ºC with an average of 11.49 ºC. Mean daily water temperature was calculated and a temperature profile was created (Figure 8). Water temperatures all increased throughout the season as expected, and temperatures stayed within the thermal tolerances for captured species.

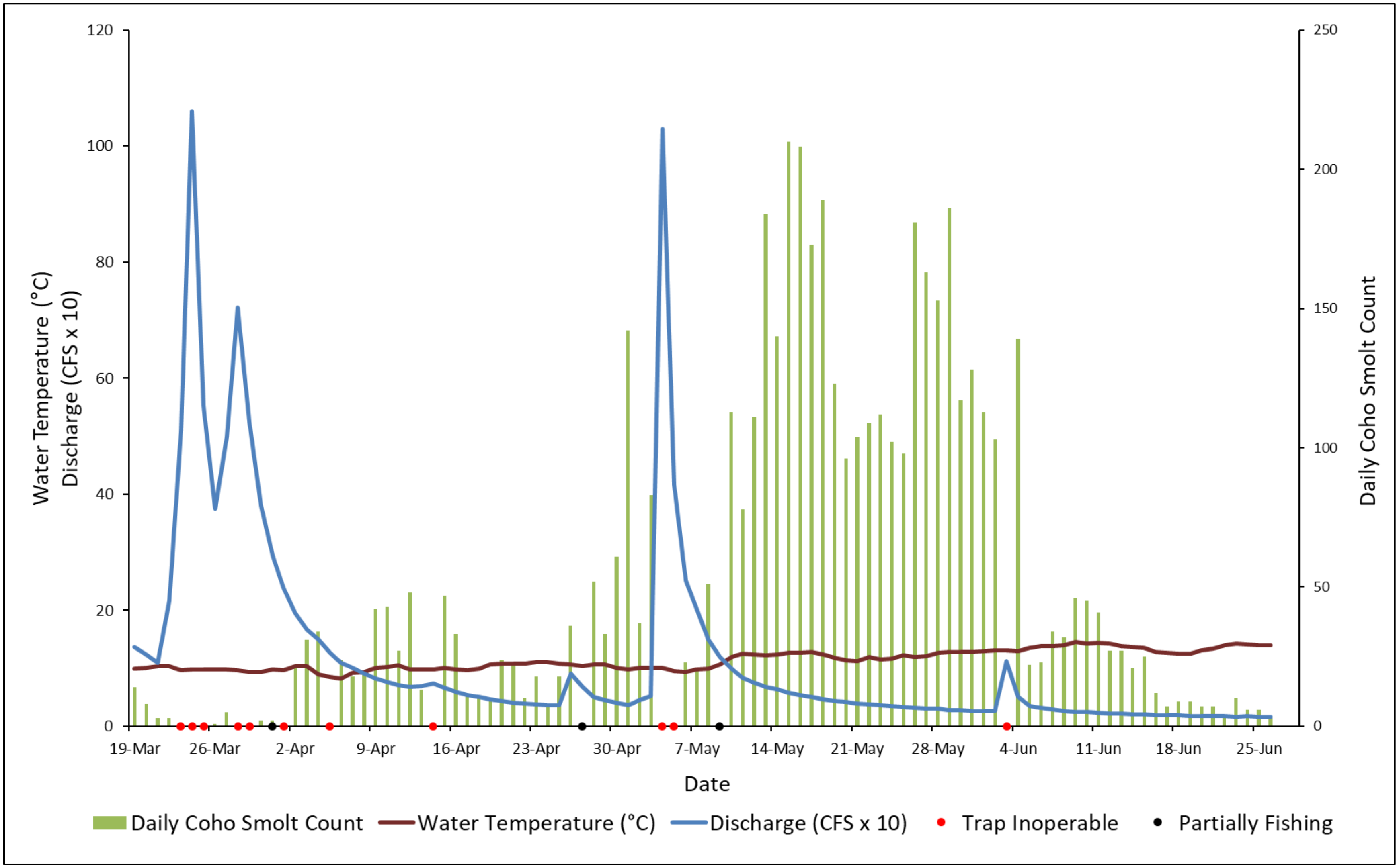

Figure 9. Histogram of coho smolt captures (vertical green bars), stream discharge (blue line), water temperature (maroon line), trap inoperable days (red dot) and trap partially fishing days (black dot) during the 2024 trapping season in Little River, Humboldt County, California.

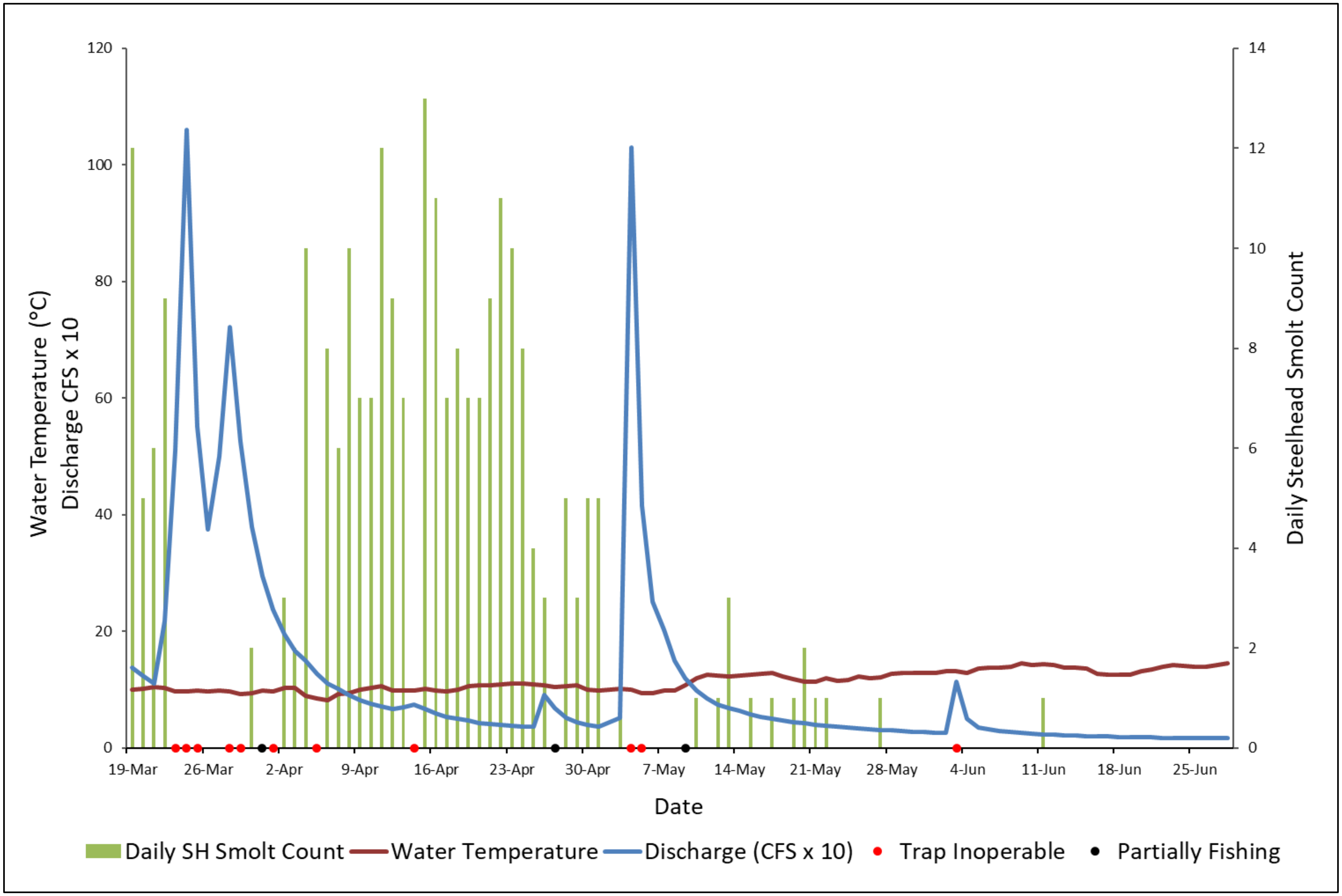

Figure 10. Histogram of steelhead (SH) smolt captures (green bars), stream discharge (blue line), water temperature (maroon line), trap inoperable days (red dot) and trap partially fishing days (purple dot) during the 2024 trapping season in Little River, Humboldt County, California.

Species Composition and Abundance

Ten species (8 fish and 2 amphibian) were captured in the outmigrant traps during the 2024 season at MSLR (Table 7). Fifty percent of the fish species (97% of all captures) were in the genus *Oncorhynchus*. The remainder of species were incidental captures of non-target species, primarily sculpin, three spined stickleback, lamprey and amphibians.

Table 7. Summary of species captured during 2015-2024 outmigrant trapping in the Little River, Humboldt County, California.

		Year									
Common Name	**Scientific Name**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Coho Salmon	*Oncorhynchus kisutch*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Chinook Salmon	*Oncorhynchus tshawytscha*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Steelhead	*Oncorhynchus mykiss*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Coastal Cutthroat Trout	*Oncorhynchus clarki clarki*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Eulachon	*Thaleichthys pacificus*	N	N	N	N	N	Y	N	Y	N	N
Pacific Lamprey	*Entosphenus tridentatus*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Western Brook Lamprey	*Lampetra richardsoni*	Y	N	Y	N	N	N	N	Y	Y	Y
Pacific Giant Salamander	*Dicamptodon tenebrosus*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Tailed Frog	*Ascaphus truei*	N	N	Y	N	Y	N	N	Y	N	N
Red-legged Frog	*Rana aurora*	N	N	N	Y	Y	N	Y	Y	N	Y
Rough-skinned Newt	*Taricha granulosa*	N	N	N	N	N	N	Y	N	N	N
Northwestern Salamander	*Ambystoma gracile*	N	N	N	N	N	N	N	N	Y	N
Prickly Sculpin	*Cottus asper*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Humboldt Sucker	*Catostomus occidentalis humboldtianus*	Y	N	N	N	N	N	N	N	N	N
Three-Spined Stickleback	*Gasterosteus aculeatus*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Discussion

Population Estimates

Based on the three-year life history of coho (Murphy and Meehan 1991), the 2024 population estimates in mainstem Little River was the fourth time this cohort was estimated (Figure 4). The 2024 coho smolt estimate (10,216) documented this year at MSLR suggests that this low strength cohort increased significantly (65.7%) since the last time it was monitored in 2021 (6,164).

This year was the tenth year of outmigrant trapping on the lower mainstem of Little River at MSLR. This year's population was the largest estimate for this particular cohort (10,216) and the fourth largest estimate for any cohort since MSLR was established in 2015. The 2024 estimate suggests that this low strength cohort has experienced a steady increase in coho smolts since the first time we observed it in 2015. In general, all three cohorts are displaying positive trends in estimate size. The MSLR estimate should be interpreted as a basin-wide estimate for Little River. Having the RST located in the lower river has allowed GDRCo monitoring efforts to better capture the overall annual production in Little River. The MSLR rotary screw trap is easier to install while spring flows are elevated and allows for the capture of early emigrants that have potentially begun their downstream migration out of the tributaries. However, undoubtedly, some coho smolts are emigrating downstream below our mainstem monitoring site during winter and early spring prior to the installation of the mainstem trap.

The DARR 2.0 software calculated a 71% capture probability for coho smolts during the first three periods of trapping in 2024. The average trap efficiency for all other nine years during that time frame is around 43%. This relatively high trap efficiency was likely due to a small sample size from inconsistent trapping during high flows with a significant portion of inoperable days (Bjorkstedt 2005).

The observed dynamics of coho smolt production within the Little River watershed are presumably a result of multiple factors, including climate, ocean conditions, predator-prey dynamics, spawning and rearing habitat availability, and anthropogenic disturbances, all acting synergistically. A comprehensive analysis is needed to better understand what is truly associated with the observed dynamics of coho smolt populations in Little River.

The steelhead smolt estimate in 2024 was the second highest on record (1,332) for MSLR. This was a significant increase from 2023 (234) which was the lowest steelhead estimate on record. In Blue Creek, tributary to the Klamath River, peak steelhead smolt emigration occurred from mid-March through mid-April (Gale 2003); earlier than the initiation date for several of the historical outmigrant trapping seasons in Little River. The fluctuations in steelhead smolt estimates observed at MSLR could be a product of the timing of trapping initiation. Out of the ten years of trapping MSLR, the three lowest estimates for steelhead smolts occurred in years when trapping began on April 2nd or later. In 2024, trapping was initiated on March 19th which is about average and appears it was early enough to capture a significant portion of the steelhead smolt migration that peaked around April 15th. However, there were significant steelhead smolt captures on the first couple days of trapping which may have been the end of an initial peak.

Cutthroat smolts were also detected at MSLR in 2024 and the population estimate was 65. The population estimates of cutthroat smolts at MSLR overtime are relatively low compared to steelhead and coho, which is likely due to several different factors. First, similar to steelhead, the average low number observed may be at least partially an artifact from the timing of the trapping season. Second, both species are iteroparous and have variable fresh water rearing times (steelhead = 1-3 years and cutthroat = 2-5 years) and ocean rearing times (steelhead = 1-4 years and cutthroat = 1-2 years) (Moyle 2002), making it difficult to assess population trends using juvenile estimates alone. Lastly, the morphologic criteria used to categorize steelhead and cutthroat as smolts is subjective and has varied over time among the different crew members. In general, categorizing trout as smolts (as compared to 1+ or greater steelhead or cutthroat) has become more conservative over time which may partially explain the observed numbers for these species. Starting in 2024, we are taking photos of all steelhead and cutthroat smolts to help better understand the morphological distinctions that the field crew is using to differentiate smolts from 1+ fish.

Due to the difficulties in estimating steelhead and cutthroat smolt populations mentioned above, it seems appropriate to at least consider the observed numbers of steelhead 1+ and cutthroat trout 1+ to gain a better understanding of the population status for these two species in the Little River basin (Figure 7). The observed numbers of steelhead 1+ at the MSLR site from 2015-2024, suggests that the population of this species is relatively stable and in 2024 there was an increase in observations. The observed numbers of cutthroat trout 1+ at the MSLR site from 2015-2024 suggest that the population size is variable overtime and similar to steelhead 1+ there was an increase in observations in 2024.

Size and Condition

The sizes and weights documented for salmonids in Little River during the 2024 outmigrant trapping season were similar to those reported in years past. The lack of any obvious change in fish size and condition suggests that there have been no significant changes to the availability and quality of rearing habitat in Little River. Salmonid growth increases at varying rates depending on the abundance of aquatic insects and plant life during critical rearing periods (Murphy and Meehan 1991). Size can also be influenced by density related competition (Imre et al. 2005). The seemingly consistent size and length among salmonids captured at the trap sites suggests that these factors are relatively constant in the Little River watershed.

Migration Timing

The migration phenology for coho smolts at MSLR over time shows that all years have at least one significant peak in migration around the first or second week in May with the average peak for all years on May 15^{th}. In 2024, there were two notable peaks in migration, the larger of the two peaks occurring on May 15^{th} (210) and the second occurring on May 29^{th} (186). The May 15^{th} peak was initiated on May 10^{th} which corresponds to the last day that water temperature remained above 10^{o}C and the discharge remained below 120 cfs.

On January 13^{th}, the USGS gauging station on Little River recorded a stage height of 15.6 feet (2^{nd} highest on record) with a discharge of 8760 cfs. Several other winter storm systems persisted throughout January and February keeping flows elevated into early March. The initiation of trapping was on March 19^{th} when stream flows receded enough to install the screw trap. During high flow events, the trap is typically removed or the cone is raised to prevent equipment damage or loss, and during these inoperable times fish are not captured. In 2024, once the trap was installed the flows in Little River continued to be unstable and that resulted in eleven inoperable days at MSLR. As flows progressively receded during the spring and into early summer, trap adjustments and modifications were made to accommodate the reduction in flows. Some of these modifications included adding rock and sandbags in front of the RST to collect more water to maintain adequate RPM's. The RST was also repositioned periodically as flows changed to achieve optimal performance. Smolt capture rates often increased in the days following trap adjustments.

The exact reasoning for the observed migration timing is likely due to a number of factors including the size of the fish, flow conditions, water temperature, dissolved oxygen levels, length of day, and availability of food (Shapovalov and Taft 1954). These factors presumably contributed to the 2024 outmigrant phenology observed in Little River.

Mortalities

The overall mortality rate observed during the 2024 trapping season was 0.08%. Several factors contributed to the mortalities observed during the 2024 outmigrant season in Little River. Predation is clearly one factor. Some of the other potential reasons for fish mortality while operating the outmigrant traps may include improper handling, trapping injury, debris loading in the trap box, and employee inexperience. Below we considered the potential role of each of these factors in the observed mortality in 2024.

It is unlikely that employee training and experience negatively contributed to the observed mortality in 2024. All crew members involved in conducting outmigrant trapping in Little River received training and three of the five members had multiple years of direct experience following the field protocols and two of the members had at least one year of the same experience. This factor is easiest to control with proper training and supervision of field crews in fish handling techniques, and the company's emphasis on the importance of this issue. Of the 12,412 salmonids handled by the field crew in 2024, there were zero mortalities related to handling.

There were a total of 8 undetermined mortalities during the 2024 trapping season. Five of those fish mortalities (2 coho smolts, 1 steelhead 1+, 1 cutthroat 1+ and 1 trout 0+) occurred on the same day during a debris loading event. A large redwood branch had floated into the trap overnight which prevented the cone from rotating and allowed debris to accumulate inside the cone. The five fish were found dead inside the cone while cleaning out the debris and fishing out the trap. The debris screen upstream of the trap was not installed due to elevated flows at that time. GDRCo will continue to explore methods to reduce this type of event from occurring in the future.

The other four undetermined fish mortalities, 3 coho smolts and 1 sculpin, occurred throughout the season and field observations did not attribute routine or excessive debris accumulation in the trap boxes as the cause. These four individuals were found inside the trap box upon checking the trap and did not have obvious signs of predation wounds.

Predation in the trap box is difficult to prevent and caused some of the observed mortality in 2024, despite efforts to minimize predation once the fish had been trapped. To comply with a reduction in authorized take for Chinook YOY, capture of this age class for all salmonids was intentionally minimized. This was achieved by using larger mesh openings (mesh size opening = 1/2", diagonally set) on the RST live boxes. Therefore, most YOY fish that entered a trap could freely escape. A second live box was added to the back of the front live-box to increase space and allow smaller fish an increased chance of avoiding predation by larger fish. Interestingly, upon checking the RST, most larger steelhead and cutthroat trout are found in the back box and do not seem to travel back and forth between the front and back boxes. Despite these efforts we did observe five predation mortalities during the 2024 trapping season. Predation mortalities were observed for a coho smolt, a steelhead 1+, an adult Pacific Lamprey and sculpin. The coho smolt was stuck in a cutthroat's mouth until it was fully regurgitated into the bucket. The steelhead 1+ was found dead in the trap but it had obvious teeth marks on its body indicating predation. The adult Pacific Lamprey was bright but was found dead in the trap box with an obvious bite mark on top of its head, possibly from an otter or a bird. It was assumed that the lamprey was killed outside of the trap and floated into the cone. The two sculpin were found inside the box and had been regurgitated by an unknown species. It is not certain when most of the predation observations occur but it is assumed that it happens while in the live box.

While the mortalities observed in 2024 were low, both in percent of fish handled and relative to the take limits provided in our Section 10(a)(1)(A) permit and CDFW Entity SCP, GDRCo continues to make efforts to further reduce mortality associated with the monitoring efforts. For example, the trapping equipment will be inspected for potential fish hazards and repaired as needed prior to deployment in 2025. Also, the trap and trap site are kept clean of debris and hazards daily. Additional training will be supplied to current and existing employees. Furthermore, we will continue to develop and implement new improvements in the trap design and handling procedures as part of our ongoing efforts. GDRCo will continue to strive towards low mortality associated with future trapping efforts.

Potential Research Improvements

GDRCo continues to research and explore options that would improve our methods and data. One improved methodology would be to apply PIT tags to smolts instead of fin clips and install PIT tag antennae at the mouth of the tributaries and in mainstem. PIT tags could also be applied to 0+ coho in the tributaries during late summer and early fall while conducting Juvenile Summer Abundance Estimate surveys while these fish are being captured for other purposes. Having PIT tag antennae at different locations and multiple life stages of PIT tagged coho would allow for a better understanding of migration patterns that occur within and outside of the trapping season. Budgeting, logistics and permitting need to be assessed and approved prior to these efforts.

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