Conservation Prospects for the North Coast

Salmon Creek Watershed, Mendocino County, California,

A Review and Analysis of Existing Conservation Plans, Land Use Trends and Strategies for Conservation on the North Coast of California

Report Prepared by The Conservation Fund
Project Funding and Support by California State Coastal Conservancy
August 2005

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Overview of Study Method and Purpose

California's North Coast is one of the richest, and rarest, ecoregions in the world. This southern extension of the temperate rain forests of the Pacific Northwest harbors rich coastal ecosystems such as coastal terrace prairies, dunes, estuaries, salt marshes, and redwood and Douglas fir–tan oak forests. Inland, the ecoregion is dominated by Douglas fir–tan oak forests, oak woodlands, annual grasslands, and mixed evergreen forests. It is home to keystone species such as the northern spotted owl, marbled murrelet, mountain lion, salmon, and steelhead, as well as the iconic coastal redwood forests. Stunning natural beauty and abundant recreational opportunities make it a destination for visitors from around the world.

It is not surprising, then, that more than 150 plans or studies have been prepared in recent years that have evaluated some aspect of the natural resources and conservation opportunities on the North Coast (see Figure 1, "Study Area"). *Many of these plans have developed thoughtful, well-reasoned recommendations for conservation action within their respective study areas. Taken together they present a trove of information about the natural, scenic and recreational resources of this remarkable region.*

At the same time, the size of the region and the number and variety of plans make it difficult to see the "big picture"—to understand from a regional perspective what the high-priority natural resources are, what factors are affecting their future viability, and what can be done to conserve them at a meaningful scale. *The purpose of this study is to build on these myriad plans to develop a regional perspective and provide a basis for implementing comprehensive conservation programs that address the many complex and compelling conservation opportunities on the North Coast.*

We present this regional perspective in three parts. Part 1—"Catalogue of Existing Plans"—provides a tool for accessing the wealth of information presented in the many natural resource plans or studies of the region. Part 2—"Synthesis of Existing Plans" presents the "big picture," using certain of the existing conservation plans to represent the major features of the region's natural diversity. Finally, in Part 3—"Assessment of the Political, Economic and Social Factors Affecting the Region, and Recommendations for Action"—we present our analysis of the forces bringing change to the region, and we make recommendations for conservation strategies and actions that respond to these forces in a comprehensive way. These three Parts are described in more detail below.

Part 1. Catalogue of Existing Conservation Plans: This part is a detailed Catalogue of the plans that we identified, during the course of our study, as useful to understanding the conditions for conservation within some portion (or all) of the study area. This Catalogue, attached as Appendix 1, lists 154 plans or studies. *The Catalogue is detailed and should be useful to conservationists and others looking for specific information about their geography or subject area of interest. Think of it as a bibliography of conservation plans for the North Coast.*

Part 2. Synthesis of Selected Conservation Plans: This Part is a review and "synthesis" of certain of these existing plans. We selected plans which, in our judgment, were sufficiently similar in scope, quality and currency that they could be integrated into a comprehensive overview of the conservation priorities, opportunities and constraints for some portion of the region. The results

of this synthesis are presented as summaries for each of the major regional watersheds, or "Hydrologic Units,"[1] within the study area. These summaries (HU Summaries), as well as an associated Synthesis Map (Figure 8), provide a survey of the region's important natural resources, threats to those resources, and priorities for conservation—as identified in the selected conservation plans. Each summary draws directly from the plans used for the synthesis for that particular unit. We did not add information that was not contained in the selected plans, nor did we determine the accuracy of their findings and recommendations. *These summaries should be useful for gaining an overview of what other conservation planners have learned about, and identified as important within, each of the watersheds within the study area.*

Part 3. Assessment of the Political, Economic and Social Factors Affecting the Region, and Recommendations for Action: Not surprisingly, the conservation priorities summarized in Part 2 reflect the dominant features of the region: temperate rain forests and associated fisheries, rich coastal estuaries and dune systems, and productive agricultural lands.[2] At the same time, they highlight major factors of change in the North Coast: how the legacy of industrial logging has affected (and continues to affect) aquatic and terrestrial resources in coastal watersheds; and, more recently, how increased pressures to convert forests, grasslands and farmlands to more intensive rural residential and agricultural uses represent a relatively new but perhaps more permanent threat to coastal conservation on the North Coast. *Part 3 of the study provides a broad perspective on the changes and trends affecting the important conservation resources of the region and recommends conservation strategies.*

Part 3 is divided into four subparts, as follows:

Part 3A looks in some detail at the political, social and economic conditions in the region to gain an understanding of what drives the land uses and human activities that threaten high-priority coastal resources identified in Part 2. Various factors, including land cover, land use, employment, housing, and key demographic data are summarized and analyzed. An examination of these conditions reveals certain factors that drive the dramatic socio-economic changes now occurring and that lie ahead for the region.

Part 3B consists of two sections. The first section—"Key Findings"—identifies the political, social and economic conditions that we believe have the greatest consequence for conservation of coastal resources. The second section—"Conclusions Informing Development of Conservation Strategies"—presents our general conclusions about how to respond most effectively to the conditions presented in the "Key Findings." These conclusions provide the basis for the conservation strategy recommendations that follow in Part 3C.

Part 3C presents general recommendations for conservation strategies that, together, provide an integrated program for achieving conservation of coastal resources as identified in the selected conservation plans. Specific examples of each of the strategies are provided, and opportunities to develop new projects are identified. These general recommendations are to:

- Move quickly to establish "working landscape" conservation management on large, strategically located forest and agricultural properties[3] in resource-rich watersheds in Humboldt, Mendocino and Del Norte counties.

- Focus other fee or easement acquisitions on unique resources that are essential to conserving high-priority coastal resources, such as coastal estuaries, old-growth redwood forest stands, coho salmon refugia, floodplains, and California Coastal Trail segments.
- Develop and support local conservation groups and programs that are committed to well planned and strategic long-term efforts to protect areas with high coastal resource values.

Part 3D describes an innovative project that presents an extraordinary opportunity to prevent forest fragmentation; enhance water quality, fisheries and wildlife habitat; and preserve local jobs in more than seven high-priority watersheds in one of the most vulnerable parts of the North Coast. Much as the 20th-century establishment of the redwood parks marked a stunning and historic advance in protecting the region's most unique and productive natural features, this project will conserve a vast array of public benefits for generations to come.

Part 1:
Catalogue of Existing Conservation Plans

A. Methodology

Existing conservation plans for the North Coast region were identified by staff and consultants of the California State Coastal Conservancy (Coastal Conservancy), The Conservation Fund, Save-the-Redwoods League, The Nature Conservancy (TNC), and GreenInfo Network. Other individuals contacted from throughout the region for review of and contributions to the Catalogue included staff of the Department of Fish and Game (DFG) and other state agencies, and representatives of local land trusts, community action groups, watershed councils and restoration groups. The Catalogue was expanded by a library search at the Coastal Conservancy, as well as an extensive Internet search.[4]

Once identified, conservation plans were searched to gather and confirm the following information: plan description, theme, and date; web address; location/watershed; availability of spatial data; and contact information. With the exception of works in progress noted above, all identified plans and database resources are included in the Catalogue.

In addition to these conservation plans, the Catalogue includes references to sources of raw conservation data for the North Coast. These include state agency databases such as The California Digital Conservation Atlas, North Coast Watershed Assessment Program, and the California Natural Diversity Database (CNDDB), federal databases such as the Environmental Conservation Online System; and other sources such as the Klamath Resources Information System and UC Davis' Information Center for the Environment.[5]

B. Description of Catalogue

The Catalogue identifies a total of 124 North Coast planning efforts, plus the 30 conservation data resources described above, for a total of 154 records. Eighteen of the conservation plans focus statewide, 17 focus on the entire region or study area, 17 focus sub-regionally, seven are county plans, and 65 are local or watershed-based planning efforts.

Descriptions of these primary types of resources are as follows:

National and international conservation plans

These general assessments rarely identify resources with the level of specificity needed for this study but do provide national or global context. North Coast resources are high priorities in plans developed by the World Wildlife Fund, Conservation International, TNC, and the North American Bird Conservation Initiative.

Regional science-based assessments focusing on a variety of natural resource values, threats, and opportunities.

These assessments are usually GIS- and watershed-based analyses that use relatively small-scale digital data sources. They often incorporate current theory in conservation biology and use proxy measures to estimate local resource values. They are particularly useful in providing broad, consistent treatment of entire regions, and they can be limited by data sources (gaps in coverage or scale problems) or by analytical assumptions that mask some of the complexity of the study area. Examples of these assessments include Save-the-Redwoods League's *A GIS-Based Model for Assessing Conservation Focal Areas for the Redwood Ecoregion and TNC's California North Coast Ecoregional Plan.*

Sub-regional conservation assessments

These assessments also usually incorporate GIS, and they often use scoring rubrics[6] to prioritize diverse scenic, natural, historic, and recreational resources. They usually focus on identifying discrete priority areas for particular conservation efforts. Advantages of these assessments include integration of local knowledge with regional data analysis. Limitations can include data gaps or problems of scale, and simplicity of rubrics. Examples of these types of plans include: Mendocino Land Trust *(MLT)'s Mendocino County Coastal Conservation Plan;* Sonoma Land Trust's *Sonoma County Coastal Parcel Study;* and Sonoma County Agricultural and Open Space District's *Acquisition Plan 2000.*

Regional professional judgments / Interest area assessments

These assessments are often workshop-based or collaborative, involving experts brought together to identify important resources. An advantage of these assessments is inclusion of various experts. Limitations can come from combining expertise rather than implementing a consistent strategy. Examples of these assessments include The California Resource Agency's California Rivers Assessment database system and its report from the "North Coast Spotlight on Conservation" workshop.

Official agency or government resource plans

Usually mandated by particular legal or political processes, these resource plans are often highly technical and data-rich, and include extensive public input. Advantages include the broad range of resources included and the adoption of these plans as policy by agencies. Limitations of these plans can include inadequate synthesis; prioritization or implementation of recommendations based on political priorities; and an emphasis on research rather than action. Examples of these plans include: Total Maximum Daily Loads (TMDL); the North Coast Watershed Assessment Program; the *Northwest Forest Plan*; National Park management plans; and State Water Resources Control Board basin plans.

Community / County General Plans

Usually updated every ten years or so, these plans are critical for guiding development in counties and communities. Mandated by law, they vary in levels of detail (or effort), public input, and expertise. These plans are very important, because they guide land use planning decisions for their respective local agencies. Unfortunately, many are now quite dated. Examples of these types of plans include County General Plans and associated Local Coastal Plans.

Local watershed plans / Collaborative local resource plans

Community watershed plans are similar to other plans but deserve their own category due to their recent popularity. Usually intensely local and community-based, these plans involve collaborative processes with diverse local stakeholders to identify key resources and resolve resource conflicts (which are often the impetus for the development of these plans). Advantages of these plans include high potential for local community input and buy-in; limitations can include lack of local scientific or policy expertise, inconsistency between plans, and lack of effectiveness in addressing politically charged issues. An example of these plans is the Tomales Bay Watershed Council's *Tomales Bay Watershed Stewardship Plan: A Framework for Action.*

Property-specific management or implementation plans

The most detailed type of planning, these plans are often prepared by agencies or groups involved in public–private collaboration on specific conservation projects. Advantages and disadvantages lie in a site-specific focus. They are not usually a good resource for regional synthesis, but they can provide useful examples of effective conservation action. Examples of these plans include Save-the-Redwoods League's *Mill Creek Property Interim Management Recommendations;* and the State Water Resources Control Board Basin TMDL and implementation plan for the Garcia River.

Part 2:
Synthesis of Selected Conservation Plans

The Catalogue presented in Part 1 attests to the wealth of recent plans and studies that have been prepared for the North Coast. Yet, given the sheer number of these plans and their varying geographic or topical emphases, it is difficult to get a sense of the whole—to discern what these plans tell us about the entire region. One still wants to know: where are the priority coastal resources? What are the principal threats to those resources? And, finally, are there some themes that run through these plans that can inform the development and implementation of conservation strategies and actions for the region?

To attempt to answer these and other questions, we selected certain of these plans that are similar in scope, quality, and currency, such that they could be integrated into a comprehensive overview of the conservation priorities, threats, and opportunities for conservation action for some portion of the region. The criteria and methods for selecting the plans we used for this "synthesis" are described in Part 2A. The results of the syntheses themselves are presented in Part 2B, as summaries for each of the Hydrologic Units ("HUs") within the study area. These summaries should be useful for gaining a quick understanding of what other conservation planners have learned about, and identified as important within, each of the Hydrologic units within the study area.[7] Finally, in Part 2C we present a "Synthesis Map" of certain of the plans (Figure 8). The Synthesis Map reveals the relationship between priority conservation areas and the underlying land use and land ownership.The HU Summaries and the Synthesis Map provide an important foundation for the analysis and development of conservation strategies presented in Part 3.

Part 2A.
Plan Selection

As described in Part 1 (Catalogue of Existing Conservation Plans), 154 North Coast conservation studies or data sources were identified at scales ranging from statewide to property-specific. This range, along with the great diversity of plan purposes, resources addressed, and plan methodologies presented challenges to the process of combining or synthesizing plans.

To reach a manageable, yet meaningful, number of plans to inform the synthesis, a selection process was developed that emphasized regional conservation plans with science-based, spacially oriented prioritizations of conservation resources. To that end, plans meeting the majority or all of the following criteria were included in the synthesis:

- Plan is a **priority-based conservation assessment,** reflecting actual or potential project priorities for currently active agencies and/or conservation organizations.
- Plan uses **spatially explicit data** that delineate specific priority areas or depict relative conservation values in the region.

- Plan is **current.**
- Plan utilizes **sound principles of conservation biology** to identify resources.
- Plan identifies **conservation resources** for the region.
- Plan comprehensively **captures target area** and resources.
- Plan **scale and data are compatible with sixth-order watershed level** (eliminating coarse-scale national plans or fine-scaled site-specific plans, e.g.).[8]

Plans that met many of these criteria but were not included in the final selection were omitted due to redundancy, lack of significant overlap with the study area, or mismatches in the format or type of their GIS data.

Based on those criteria, the following plans were selected for the synthesis:

- *California North Coast Ecoregion Aquatic Conservation Strategy Recommendations* (Aquatic Recommendations), The Nature Conservancy of California, Fall 2003
- *California North Coast Ecoregional Plan* (Ecoregional Plan), The Nature Conservancy of California, June 2001
- *Completing the California Coastal Trail* (Coastal Trail), California State Coastal Conservancy, January 2003
- *Mendocino County Coastal Conservation Plan* (Coastal Plan), Mendocino Land Trust, April 2003
- *A GIS-Based Model for Assessing Conservation Focal Areas for the Redwood Ecoregion* (Focal Areas), Conservation Biology Institute and Save-the-Redwoods League, 1999
- *Recovery Strategy for California Coho Salmon* (Recovery Strategy), California Department of Fish and Game, 2004
- *Strategic Plan Update* (Strategic Plan), Pacific Coast Joint Venture, 2004

Part 2B.

Hydrologic Unit Summaries

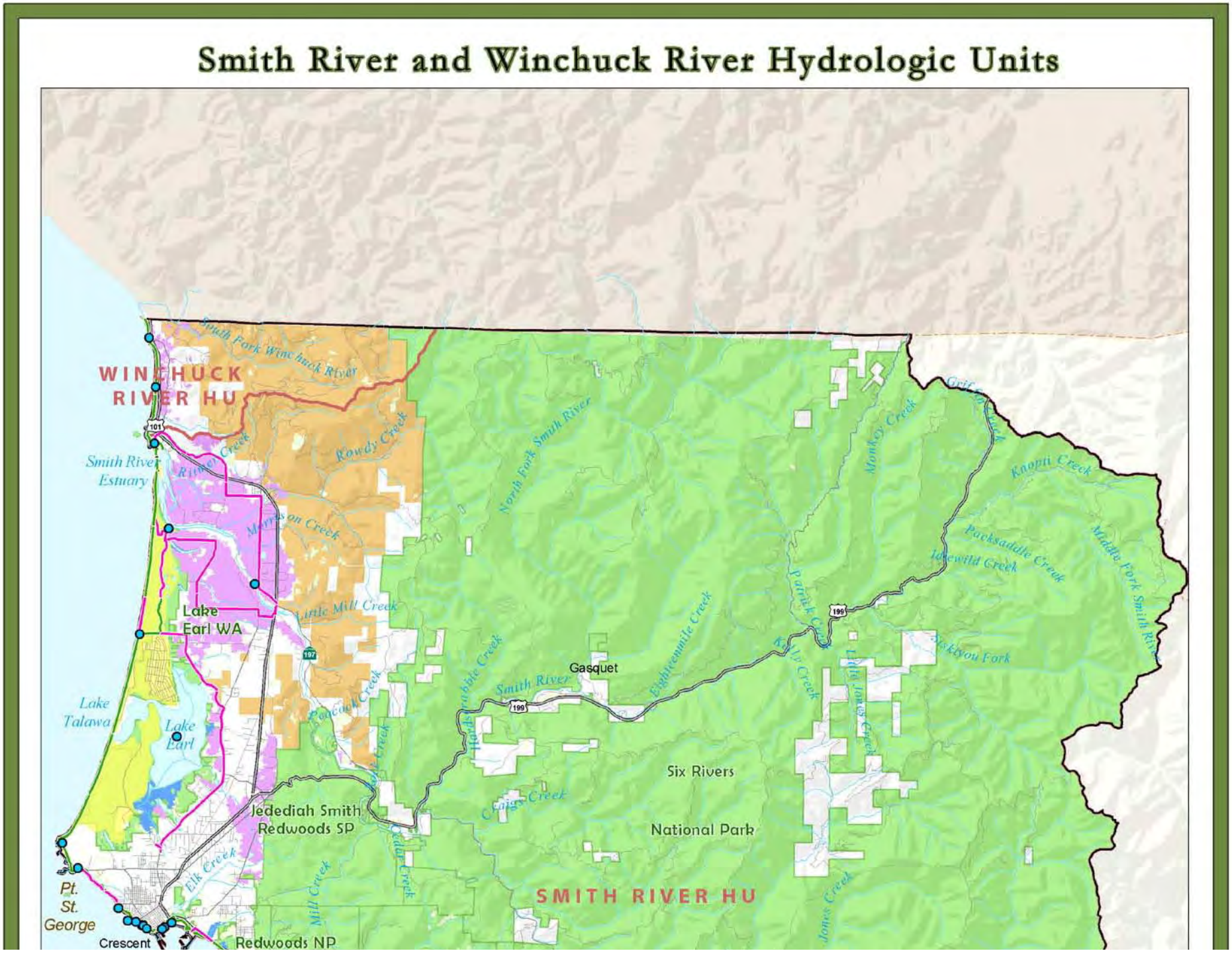
For the purposes of analysis and discussion, the North Coast region was divided into the following 13 Calwater 2.2 Hydrologic Units,[9] selected due to their standard use in geographic analyses within California:

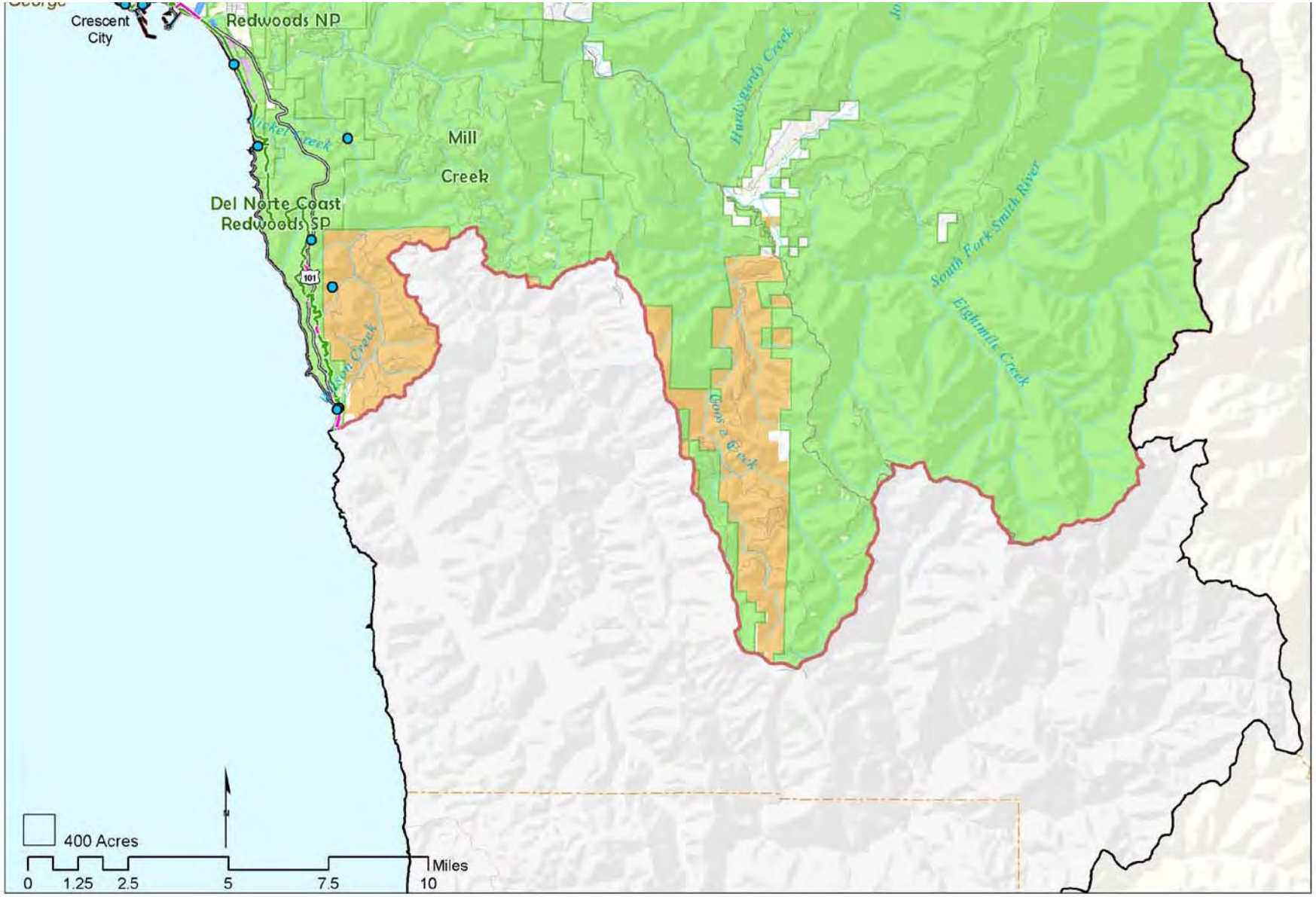
- Smith River and Winchuck River[10]
- Lower Klamath River
- Redwood Creek
- Trinidad
- Mad River
- Eureka Plain
- Eel River
- Cape Mendocino
- Mendocino Coast
- Russian River
- Bodega
- Marin Coastal

For each HU summary, planning information from the selected regional plans is detailed; additional relevant information from sub-regional plans regarding key resources and threats was included and is referenced where available. Local planning resources for each HU, not included in the synthesis due to their fine scale, are listed as additional resources.

Each summary begins with a brief introduction to the HU, including its geographic extent, ownership, population center(s), and transportation routes. Sections follow describing the HU's key resources, threats to those resources, and concentrations of priority resources as identified by the selected plans. Particular HU-specific and site-specific recommendations from selected plans are also included. Finally, a listing of planning resources for each HU is included, additional information about which may be found in the Catalogue (Appendix 1).

Figure 2: Smith River and Winchuck River Hydrologic Units Map




Crescent City
Redwoods NP
Mill Creek
Del Norte Coast Redwoods SP
101
Hurdygurdy Creek
South Fork Smith River
Eighteenmile Creek
Cous e Creek
400 Acres
0 1.25 2.5 5 7.5 Miles 10
Study Area
Hydrologic Unit (HU)
Large Forestland Ownership
Public Land
Coastal Access
Priority Potential Coastal Trail Segments, SCC
Completed Coastal Trail Segments, SCC
Grasslands
Agricultural Lands
Coastal Wetlands
Dunes (Cooper 1967)
Interstate or Highway
Major Road
County Line
River, stream or creek
Prepared by The Conservation Fund.
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Smith River and Winchuck River Hydrologic Units

Smith River Estuary *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Setting

As California's fourth largest coastal river and its longest national wild and scenic river, the Smith is often heralded as one of the finest stretches of undammed river in the country.[11] With a watershed of approximately 450,477 acres (704 mi^2), the Smith River's three main tributaries flow from the corrugated, forested highlands of the Coast Ranges toward a broad agricultural floodplain and complex tidal estuary just south of the Oregon border. The South Fork of the Winchuck River covers a much smaller drainage in California, covering only 8,721 acres (14 mi^2).

Over 80 percent of the Smith watershed is in public ownership, most of it managed as the Smith River National Recreation Area and Siskiyou Wilderness by the Six Rivers National Forest. Other major public landholdings in this watershed include Jedediah Smith Redwoods and Del Norte Coast Redwoods state parks, Talawa Dunes State Park, Lake Earl Wildlife Refuge, and a portion of Redwood National Park. The great majority (75 percent) of the Winchuck river drainage is under industrial timber management, with less than five percent in public ownership.

The area's major population center is Crescent City, with approximately 8,800 residents; its major transit routes consist of Highway 101 along the coast and Highway 199 leading from the coast northeast to Oregon.

Resources

- The Smith River HU exhibits an extraordinary diversity of North Coast ecotypes, including: redwood forest, Douglas fir–grand fir forest, ultramafic mixed conifer forest, Port Orford cedar forest, coastal prairie, mixed serpentine chaparral, montane meadow, fen, and coastal brackish marsh.[12]
- The Winchuck River HU, a relatively small watershed draining 72 square miles of coastal forests, straddles the divide between Oregon and California. The California section includes a small portion of coastal plain in the South Fork, Middle Winchuck mainstem, and Bear Creek drainages. The majority of the California portion is in agricultural use, with the remaining portion of forest lands in Green Diamond Resource Company timberland ownership.[13]
- A variety of special status wildlife species occur in the watershed, including: Del Norte and southern torrent salamanders; northern red-legged, tailed and foothill yellow-legged frogs; marbled murrelet; northern spotted owl; and black swift. Rare plants include Mcdonald's watercress, western bog violet, cobra lily, and Mt. Eddy draba.[14]
- Eleven miles of dune communities stretch between the Smith River's mouth and Point St. George to the south, in some places extending nearly two miles inland. Although a great deal of the open dune communities have been stabilized by introduced beachgrass, small pockets of dune mat and habitat for endangered dune phacelia *(Phacelia argenta)* exist. The northern dunes tend to be more stabilized and forested, with the most active dune system south of Lake Talawa.[15]
- Just inshore from the dunes are two of the largest wetland and migratory bird habitats in the North Coast, the brackish Lake Talawa and nearly fresh Lake Earl. This wetland complex is habitat for a variety of special-status species, including: Oregon silverspot butterfly; tidewater goby; brown pelican; western snowy plover; bank swallow; and western lily.[16]
- Over 60,000 migrating Aleutian Canada geese, until recently federally endangered and still of primary management concern, migrate to the 45,000-acre Smith River floodplain each year. The upper Smith River basin has some of the highest concentrations of endemic plants in North America. The National Forest includes four botanical areas, with the North Fork Smith River Botanical Area, harboring more than over 40 rare and endangered plant species.[17]
- The Smith has the healthiest combination of anadromous fish runs in the state, with important populations of Chinook and coho salmon, as well as steelhead and cutthroat trout. As a result, TNC regards the Smith as its highest aquatic priority for the North Coast region, along with the Eel, noting its primary importance for the Southern Oregon / Northern California Coast Ecologically Significant Units (ESUs) of coho salmon, Chinook and cutthroat. DFG's Recovery Strategy also ranks the entire Smith river drainage highly in terms of restoration and management potential for coho salmon.
- Forest resources within the Smith River watershed unit are largely found on public land and consist mostly of second- and third-growth forest.[18] Most of this is protected as late-successional reserve, with silvicultural guidelines that focus primarily on fuel load reduction and salvage. The

major private timber owner in the watershed is Green Diamond Resource Company, with holdings in two main tracts, one in the hills of lower Rowdy Creek and another south of Mill Creek and east of Del Norte Coast Redwoods State Park. Green Diamond Resource Company is currently working on completion of an aquatic Habitat Conservation Plan (HCP) to complement its terrestrial planning. The ancient redwood forests of Jedediah Smith Redwoods and Del Norte Coast Redwoods state parks are among the largest stands remaining in the world and represent a biologically rich example of temperate rain forest.

Threats

- Problems facing salmonids in the Smith River include amount of available habitat, degraded condition of riparian vegetation, poor large woody debris (LWD) recruitment, an altered estuarine environment, excess sediment, compacted stream gravels, and barriers to fish passage. Potential problems for coho salmon recovery in the Winchuck River HU include inadequate pool structure due to insufficient existing and recruitable conifer LWD and excessive fine sediments.[19]
- Timber harvest practices that do not allow for full ecological function of coastal forests remain among the most significant threats to species on private timberlands.[20]
- Sediment is a concern in the Winchuck watershed, with highly erosive soil types, steep inner gorge features, and active land use. In 1986, a large slide in the Wheeler Creek sub-watershed contributed huge amounts of sediment to the system, and is still delivering fine materials. The Middle Winchuck mainstem is ranked moderate density for road crossings and moderate density for roads on steep slopes. Bear Creek is ranked moderate density for roads on steep slopes.[21]
- A hydrologic assessment of the Winchuck watershed rated the Lower and Middle Winchuck sub-watersheds as moderate for risk of peak flow enhancement (increased stream power) due to agricultural use. The South Fork Winchuck rated moderate risk due to rural roads. All sub-watersheds rated low risk for peak flow enhancement due to timber harvest and forest roads.[22]
- The mixture of migrating geese and agricultural operations on the floodplain has raised concern over maintaining wetland and riparian habitat on private lands, and local activists have raised concerns over managing toxic releases by the agricultural industry.[23]
- Coastal agriculture is threatened by urban encroachment from Crescent City northward along the floodplain.
- Despite the absence of dams in the Smith River watershed, the latest version of the Calfish Passage Assessment Database (included in earlier versions within the Recovery Strategy and the Coastal Conservancy's *Assessment of Barriers to Fish Passage in California's Coastal Watersheds*) lists 1,118 potential barriers on the Smith River, as well as nine within the Winchuck River HU.[24] Despite concern over the impact of high sediment loads on fish, the Smith is not currently considered impaired under Section 303d (federal Clean Water Act) standards and is not on the State Water Quality Control Board's (SWQCB) list for Total Maximum Daily Load (TMDL) development and implementation.

- The Mill Creek watershed has been identified by DFG and others as priority coho salmon refugia. Although now almost entirely in public ownership, the aquatic system is threatened by sediment production from legacy logging roads in the upper watershed.

Priority Conservation Sites from Selected Plans

The selected conservation plans agree on the overarching importance of the Smith River watershed unit. The entire watershed is identified as a high priority in the Recovery Strategy and TNC's Aquatic Recommendations; it is marked a "Key Watershed" by the Forest Service; and over 77 percent of the watershed falls within TNC's portfolio conservation areas (i.e., areas identified by TNC as having high-quality, viable examples of natural diversity representative of the relevant ecoregion). This follows largely from the watershed's mix of high resource values and relatively manageable impacts (the latter including relatively less disconnected aquatic habitat, high percentages of forestland in protected areas, high habitat linkage potential, and relatively unimpaired water quality).

In particular, a coincidence of identified regional priorities occurs on public and Green Diamond Resource Company lands in upper Rowdy Creek, as well as along the Highway 199 corridor between Jedediah Smith Redwoods State Park and the confluence of the North and Middle forks, and including the Craig's Creek drainage just to the south. This overlapping of priorities reflects a coincidence of late-seral redwood communities with the importance of the lower and middle river stretches to salmonids. These areas exhibit strong, consistent presence of salmonids; northern spotted owl, black swift, and marbled murrelet habitat, large patches of mature and old forest, and low forest fragmentation.

In addition, a significant clustering of identified wetland, coastal dune, and public access priorities occurs along the coast between the Smith River estuary and Lake Earl. There is general agreement among plans that working in this area with willing private landowners through easement and acquisition programs will be key to conserving floodplain resources on private lands, providing public access through California Coastal Trail segments, protecting local agriculture, restoring important wetlands, and resolving management issues in the environs of the Lake Earl Wildlife Refuge.

General Action Recommendations

- Recruit LWD by protecting current recruitment areas within mature coniferous riparian zones, improve creation of new debris through artificial placement and reduction of removals, and creation of adequate riparian setback zones.
- Assess and treat barriers to fish passage, restore gravel-reach spawning grounds, deep pool structure, and riparian cover.
- Treat sources of sediment input into the river system, including decommissioning, maintaining and upgrading roads, as well as replacing culverts (which also facilitates fish passage).
- Control exotic vegetation, particularly canary grass.

- Acquire easements on priority public forest inholdings, riparian forest, and within landscape linkage areas.
- Develop administrative structures and plans for managing noxious weeds, improve care of botanical areas and Darlingtonia fens, and improving fire safety.
- Work with farmers, dairy operators, and others on incentives to provide pasture for geese (e.g., land swaps and reimbursement for habitat destruction of pastures by geese).
- Implement the least disruptive gravel extraction techniques in the watershed, once identified.[25]

Site-specific Action Recommendations

Aquatic[26]

- Pursue forest restoration, road improvement, and road removal in the Mill Creek drainage.
- Assess and treat barriers to fish passage on smaller tributaries, including Clarks, Morrison, Peacock, Sultan and Little Mill creeks.
- Restore gravel-reach spawning grounds as well as deep pool structure and cover for cool-water refugia, including restoration in sloughs, especially in Yontocket, Tillas and Tryon sloughs.
- Restore channelized streams such as Lower Rowdy and Dominie creeks to natural meanders.
- Develop a short-term plan to increase LWD in the Winchuck River HU until natural recruitment can be restored, as well as a long-term plan to restore the mature coniferous riparian zone in the South Fork Winchuck River.

Terrestrial and Wetland [27]

- Prevent the development of properties in the Lake Earl floodplain and Smith River Delta through acquisition of fee or easements from willing sellers, to support natural flood and estuary processes.[28]
- Restore and enhance floodplain riparian forests in the lower Smith River delta.
- Collaborate with private landowners to protect habitat and resolve management issues at Lake Earl.
- Provide roosting for water-associated birds by acquiring forested areas adjacent to Lake Earl and Lake Talawa from willing sellers.
- Acquire and enhance wetland areas from willing sellers in the Elk Creek wetland complex, the Crescent City marshes, and south of Point St. George

Coastal Trail, Public Access and Recreation [29]

- Collaborate with private landowners to design improvements at the California–Oregon border crossing.

- Construct vertical access-ways at the mouth of the Smith River.
- Improve roadway corridor for non-motorized travel (across the Smith River delta).
- Encourage Caltrans to design improvements for pedestrians and bicycles at the crossings of the Smith River along Highway 101.
- Design and build multi-use trails across Point St. George headland, connecting Crescent City with Talawa Dunes State Park.
- Complete pedestrian and bicycle improvements cited in the Crescent City Harbor Trail Study.
- Support efforts to develop trails within the Mill Creek property that connect with the California Coastal Trail.

Data Gaps

Data gaps for the Smith River HU include:

- Complete assessment of barriers to passage for anadromous fishes.[30]
- Fish monitoring and analysis of limiting factors per the *Smith River Anadromous Fish Action Plan*.[31]
- Continued assessment of development trends and habitat values on private lands of the Smith River Delta.
- Assessment on the effects of salmon hatchery output.[32]
- Identification and prioritization of oak woodland habitat.

Local Planning Information *(see Catalogue, Appendix 1)*

- *Six Rivers National Forest Land and Resource Management Plan*—USDA Forest Service
- *Del Norte County General Plan*—Del Norte County
- *Aleutian Goose Wildlife Corridor Management Plan*—Humboldt County Resource Conservation District
- *Crescent City Marsh and Wildlife Area Management Plan*—California Department of Fish and Game
- *"Land Laying Outward Place" - Point St. George Management Plan*—Point Saint George Management Plan Steering Committee
- *Lake Earl Wildlife Area Management Plan (Draft)*—California Department of Fish and Game
- *Mill Creek Property Interim Management Recommendations*—Save-the-Redwoods League
- *Pacific Shores Subdivision Analyses*—Smith River Alliance

- *Smith River Anadromous Fish Action Plan*—Smith River Advisory Council
- *Aquatic Habitat Conservation Plan and Candidate Conservation Agreement with Assurances*—Simpson Timber Company (now Green Diamond Resource Company)

Lower Klamath River Hydrologic Unit

Klamath River Estuary *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Setting

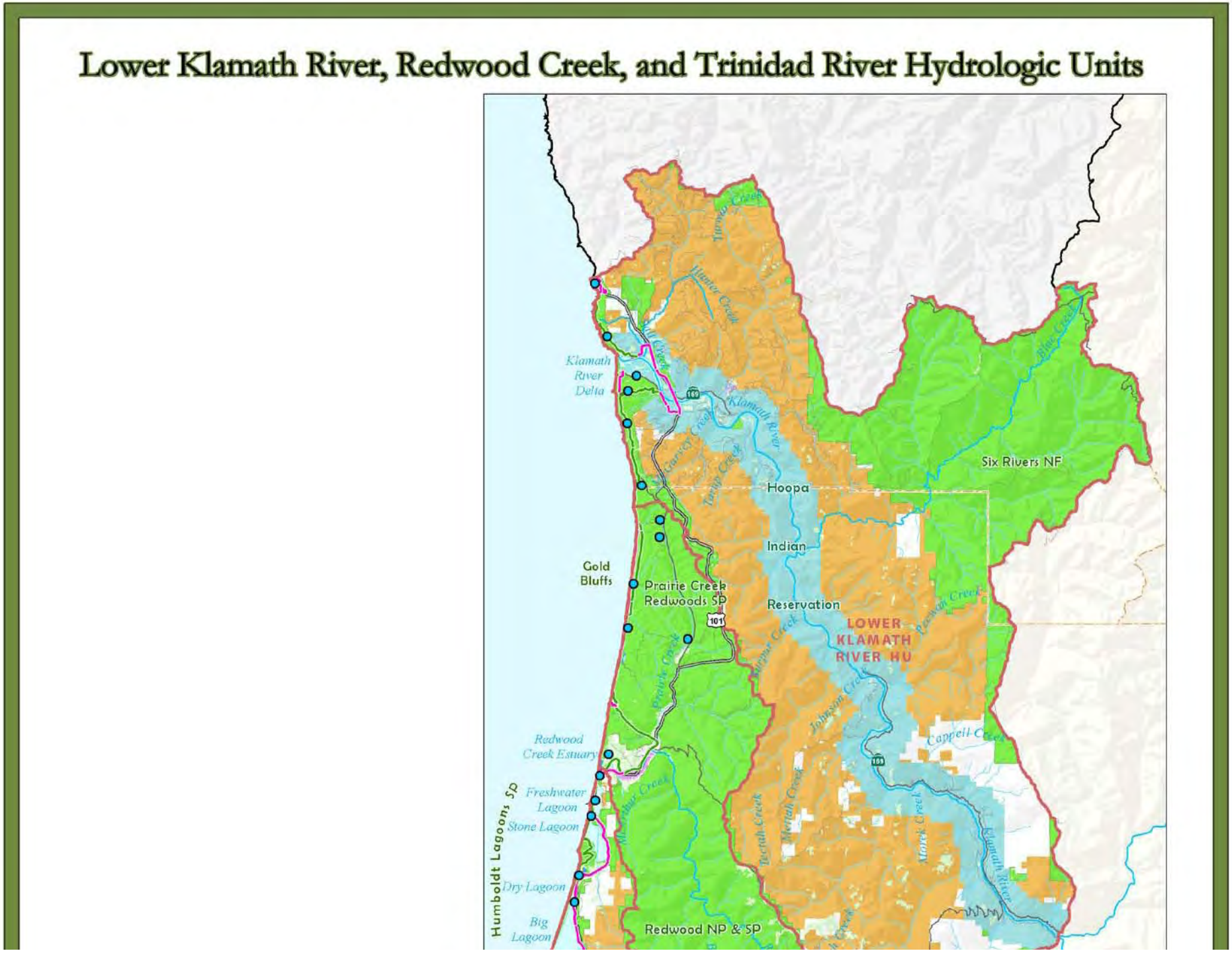
As California's second largest river, the Klamath drains a watershed of approximately 979,816 acres (1,531 mi^2) through over 1,800 miles of waterways. At its base sits the Lower Klamath River HU (318,363 acres, 497 mi^2), which stretches nearly 40 miles from the mouth of the Salmon River to the mouth of the Klamath River at the Pacific Ocean. Major tributaries above the HU include the Trinity, Salmon, Scott, and Shasta rivers.

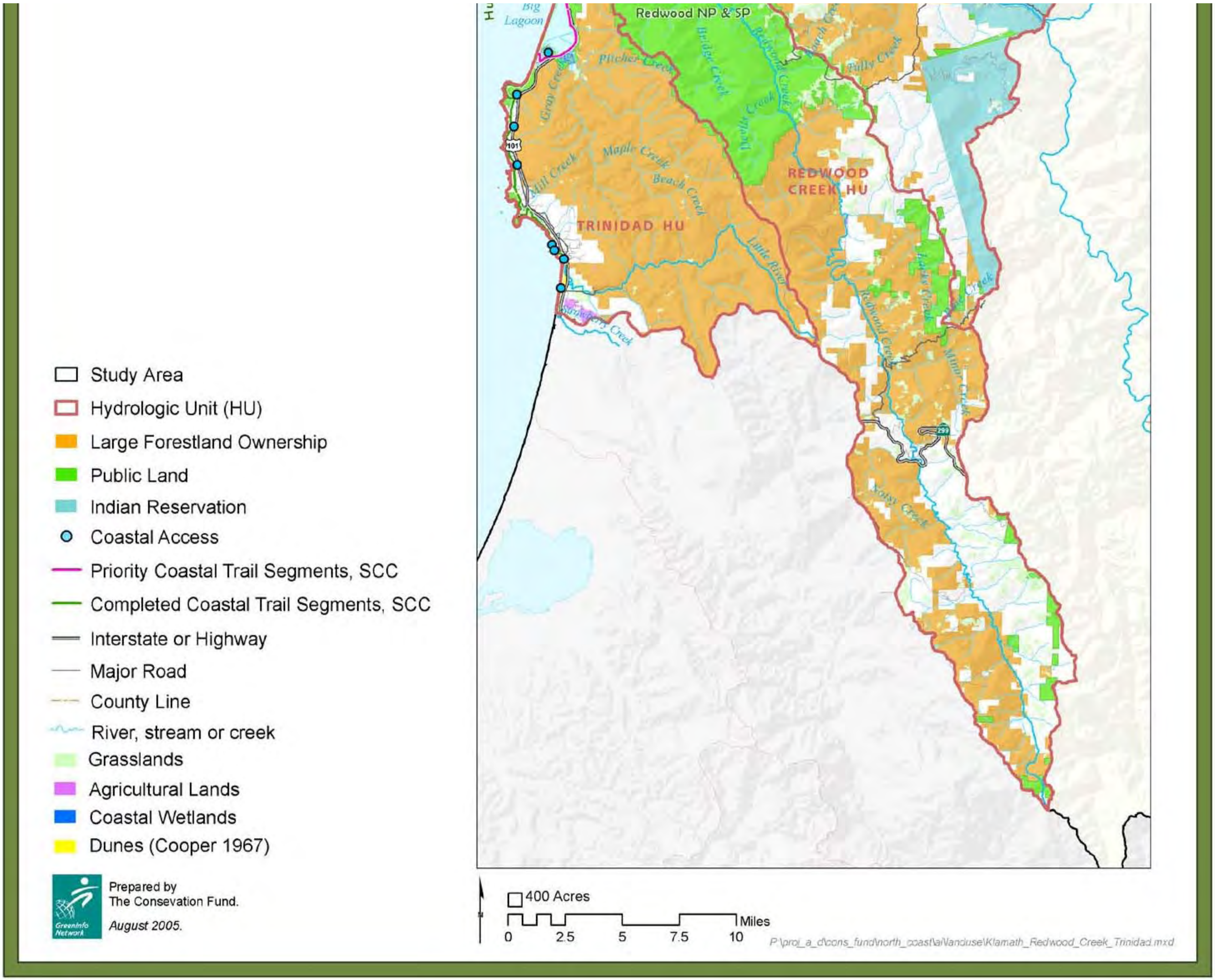
With over 53 percent of its land in industrial timber ownership, the Lower Klamath HU is one of the most timber-dominated HUs in the region. Significant public ownership occurs in the upper Blue Creek watershed, part of Six Rivers National Forest. Additionally, the Klamath River is part of the national and state wild and scenic river systems. The designated portion flows through the Yurok and Hoopa Indian reservations; these tribes mix indigenous methods of resource management with scientific natural resource management. About 1,100 Yurok living on the reservation comprise the area's major population. Highway 169 provides access from Highway 101 in the northeast and from Highway 96 in the southeast.

Resources

- The Lower Klamath HU exhibits a variety of biotic communities from the Pacific coast to interior mountains, including predominantly montane hardwood and Douglas fir communities, as

Figure 3: Lower Klamath River, Redwood Creek, and Trinidad River Hydrologic Units Map





Redwood NP & SP
Big Lagoon
Pitcher Creek
Bridge Creek
Redwood Creek
Devils Creek
Pully Creek
Gray Creek
Maple Creek
Beach Creek
Mill Creek
REDWOOD CREEK HU
TRINIDAD HU
Little River
Redwood Creek
Lacks Creek
Strawberry Creek
Minor Creek
Noisy Creek
101
299
Study Area
Hydrologic Unit (HU)
Large Forestland Ownership
Public Land
Indian Reservation
Coastal Access
Priority Coastal Trail Segments, SCC
Completed Coastal Trail Segments, SCC
Interstate or Highway
Major Road
County Line
River, stream or creek
Grasslands
Agricultural Lands
Coastal Wetlands
Dunes (Cooper 1967)
Prepared by
The Conservation Fund.
August 2005.
400 Acres
0
2.5
5
7.5
10
Miles
P:\proj_a_d\cons_fund\north_coast\ai\landuse\Klamath_Redwood_Creek_Trinidad.mxd

well as a smaller complement of redwood forest, Klamath mixed conifer, montane riparian, and coastal oak woodlands. Priority communities present include grand fir–Sitka spruce forest, ultramafic mixed conifer forest, and Port Orford cedar forest.[33]

- Protected bird species include the northern spotted owl, bald eagle, marbled murrelet, California brown pelican, and short-tailed albatross.[34] A variety of rare plants includes western lily, pink sand verbena, coastal *Trinquetrella,* and Wolf's evening primrose.
- The Klamath River delta, located near Requa, includes both floodplain and wetland complexes. The delta includes open water associated with the river and tidal areas; 110 hectares (280 acres) of fresh and brackish marsh; and 260 hectares (650 acres) of floodplain riparian forest. Shorebirds are the most numerous water-associated wildlife in the delta, and often number in the thousands.[35]
- The Klamath River is extremely important to anadromous fish, including coho salmon, Chinook salmon, and steelhead trout. Coastal cutthroat trout are present in the lower river and its local tributaries.[36] Despite impacts to the region, surveys have indicated that coho salmon are present today in much of their historic habitat.[37]
- Other key aquatic species present in the watershed include: Eulachon, green sturgeon, river and Pacific brook lampreys, southern torrent salamander, foothill yellow-legged, northern red-legged and tailed frogs.[38]

Threats

- Problems facing anadromous salmonids in the Klamath River include: high summer water temperatures; lack of access to available habitat; erosion and sedimentation; degraded condition of riparian vegetation; depleted LWD; water diversions and/or pumping; legacy impacts from historical mining; and agricultural conversion.[39]
- Threats to coho salmon in the lower Klamath include: feral cattle in lower Blue and Bear creeks impacting riparian vegetation and increasing streamside erosion; excessive sedimentation and erosion due to removal of up to 90 percent of canopy from some tributaries; low habitat diversity; loss of confluence connectivity; and reduced habitat quantity and complexity.[40]
- Timber harvest practices that do not allow for full ecological function of coastal forests remain among the most significant threats to species on private timberlands.[41]
- Feeding pressure from California sea lions and harbor seals on salmonids in the Klamath River mouth may impact the recovery of salmon and trout populations.[42]
- The August 2004 version of the Calfish Passage Assessment Database lists 736 potential barriers to fish passage on the Klamath River. The river is also listed as impaired on the federal 303(d) list under the Clean Water Act due to nutrients, temperature, and organic enrichment.

Priority Conservation Sites from Selected Plans

Overall, the Lower Klamath is a relatively lower priority among many of the North Coast plans examined here, with fewer clusters of high-priority resources than other HUs. The DFG Recovery Strategy, however, identifies the entire HU as a high priority for coho salmon due to the mixture of consistent salmon presence, high levels of disconnected habitat, and high risk of extinction. A moderate amount of the HU is captured in TNC portfolio areas (47 percent), largely in the Blue Creek and lower reaches of the Klamath, and the Lower Klamath is considered a moderate priority for salmonids in TNC's Aquatic Recommendations.

The most significant clustering of resources in the HU comes in the lower reaches of the Klamath River estuary. Here a sliver of high-value forest resources stretches along Salt and Hunter creeks and to the west of the Highway101 corridor towards the river mouth, where a series of wetland, aquatic and coastal access segments have been identified.

General Action Recommendations

- Reduce sediment from upslope sources by decommissioning roads and skid trails; upgrading roads and maintenance practices at stream/road crossings; stabilizing slopes; and minimizing the alteration of natural hill slope drainage patterns.
- Investigate temporal and spatial magnitude of tributary deltas and seasonal subsurface flow reaches, to determine effects on juvenile and adult coho salmon migration and to quantify seasonal loss of lower tributary habitat. Investigation should include: assessment of long-term delta size trends; annual variation in coho salmon access periodicity by tributary; quantification of seasonal habitat loss and fish stranding; and the relation of delta and subsurface flow formation to upslope erosion, river and tributary flow, mainstem bed load deposition, and other causative factors.
- Restore in-channel and riparian habitat in tributaries to: revegetate riparian zones with native species (e.g., conifers) to stabilize stream banks and promote a long-term supply of LWD; limit development and grazing inriparian areas; and relocate roads out of riparian areas where feasible.
- For slow-velocity habitats for coho salmon winter rearing, develop a plan to provide suitable accumulations of LWD on a short-term basis by placing wood in needed areas until natural supplies become available.
- Acquire wetland areas from willing sellers.
- Pursue cooperative management agreements among DFG, Redwood National Park, and other public agencies with respect to wetlands in public ownership.

Site-specific Action Recommendations

Aquatic[43]

- Develop a plan to restore off-channel estuarine, wetland, and slough habitat in lower Hunter and Salt creeks. Determine if key properties, conservation easements, or development rights should

be purchased from willing sellers; and encourage the installation of livestock exclusion fencing to protect restored areas.

- Develop a plan to maintain Blue Creek watershed tributaries as key thermal refugia and for their cool water contributions to the mainstem Klamath River. The plan should ensure that:: sediments from upslope activities do not impact the refugia; upslope stabilization and restoration activities (including road assessment and treatment) continue; and in-channel and riparian restoration efforts (target riparian retention efforts) continue.
- Plan for the protection and restoration of Klamath River mainstem tributaries, even those that do not support populations of coho salmon but that provide cool water and improve mainstem Klamath River water quality, particularly during warm summer months. Actions should: protect and/or restore riparian habitat; stabilize upslope areas to prevent sedimentation and aggradation at the mouth of tributaries; and reduce impacts to riparian corridors.
- Construct livestock exclusionary fencing and corresponding riparian restoration as necessary in Salt, lower High Prairie, lower Hunter, and lower Terwer creeks. Where necessary, provide funding and incentives to landowners and/or restoration groups to achieve this goal.
- Remove feral cattle from lower Blue and Bear creeks.
- Work with Humboldt County, NOAA Fisheries, and existing and future gravel-mining operators to restrict gravel-mining operations to appropriate mainstem Klamath River locations.
- Provide technical and financial support to implement riparian restoration throughout alluvial reaches in lower Blue, Terwer, Hunter and Salt creeks.

Terrestrial and Wetland [44]

- Pursue opportunities for cooperative wetland management, restoration, and enhancement projects with private landowners, especially near the Hunter Creek/Panther Creek complex.
- Restore and enhance wetland values and wildlife values, especially in floodplain riparian forests, on public-owned lands in or adjacent to the Klamath River.
- Develop a plan to restore the historic floodplain on Hoppaw Creek, in cooperation with landowners and Caltrans.[45]

Coastal Trail, Public Access and Recreation[46]

- Encourage Caltrans to design improvements for pedestrians and bicycles at the Klamath River crossing along State Highway 101.

Data Gaps

Data gaps for the Lower Klamath HU include:

- Complete investigation of temporal and spatial magnitude of tributary deltas and seasonal sub-

surface flow reaches, to determine impacts to juvenile and adult coho salmon migration and to quantify seasonal loss of lower tributary habitat. Investigation should include: assessment of long-term delta size trends; annual variation in coho salmon access periodicity by tributary; quantification of seasonal habitat loss and fish stranding; and the relation of delta and subsurface flow formation to upslope erosion, river and tributary flow, mainstem bed load deposition, and other causative factors.

- Evaluate feasibility of reestablishing adult coho salmon passages above major barriers in lower Roaches and Tully creeks and the Middle and North forks of Ah Pah Creek.
- Investigate impacts of exotic fish populations (e.g., bass and bullhead) in the abandoned mill pond in lower Richardson Creek on coho salmon in the adjoining Klamath River estuary.
- Identification and prioritization of oak woodland habitat.

Local Planning Information *(see Catalogue, Appendix 1)*

a) *Forest Management Plan*—Hoopa Valley Tribe, Tribal Forestry Department

b) *Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program*—Klamath River Basin Fisheries Task Force

c) *Lower Klamath River Sub-Basin Watershed Restoration Plan*—Lower Klamath Restoration Partnership (Yurok Tribe and Simpson Timber Company)

Redwood Creek Hydrologic Unit

Redwood Creek Estuary (*Copyright © 2002-2005 Kenneth &Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Setting

The Redwood Creek HU centers on a 40-mile salmon-bearing stream flowing from broad Douglas fir forestlands toward 41,000 acres of protected ancient coast redwood forest. Its lower stretches include a varied rocky coastline along with small amounts of pastureland and seasonal wetland, while along its eastern divide stretch the Bald Hills, a mosaic of high prairies and oak woodlands.

With a watershed of approximately 187,853 acres (294 mi^2), Redwood Creek's lower basin, as well as its Prairie Creek tributary, is public parkland managed by Redwood National and State Parks. The primary private land use activity in the upper and middle Redwood Creek watershed is timber production, comprising 35.2 percent of its area.

Highway 101 is the major transportation route in the HU, extending along the coast toward the small town of Orick (pop. 487), with Highway 299 transiting the middle reaches of Redwood Creek toward Willow Creek.

Resources

- Redwood National and State Park (RNSP) is a World Heritage Site and an International Biosphere Reserve, containing 41,000 acres of ancient coast redwood forest as well as the Little Lost Man Creek Research Natural Area.

- Land cover in the Redwood Creek HU is fairly evenly split among redwood forest, Douglas fir, and montane hardwood types, with small amounts of grassland, oak woodland, montane riparian forest, and montane chaparral.[47] Along the coast, there are scattered stands of Sitka spruce, coastal scrub, and coastal terrace prairie. Farther inland, Douglas fir dominated forests are intermixed with grasslands along the eastern ridge-tops.
- Special status birds include northern spotted owl, marbled murrelet, western snowy plover, bald eagle, brown pelican, and the recently de-listed peregrine falcon. Roosevelt elk, black bear, and mountain lion occur, and large amounts of the watershed are considered suitable for Pacific fisher.
- Redwood Creek is recognized as an important anadromous fish stream supporting coho salmon, Chinook salmon, steelhead trout, and coastal cutthroat trout. TNC's Aquatic Recommendations places the Redwood Creek watershed in its top priority category for salmonids in the region.
- Other important aquatic and riparian species include redwood juga, tidewater goby, Pacific brook lamprey, southern torrent salamander, Del Norte salamander, foothill yellow-legged frog, northern red-legged frog, and tailed frog.[48]
- The remnant Redwood Creek estuary covers about 50 hectares (125 acres) of tidal flats, river bars, and open water. The estimated 570 hectares (1,415 acres) of pasturelands through which Redwood Creek flows are similar to other coastal pastures that tends to be water-saturated and flood easily during the rainy season. Both shorebirds and waterfowl use these wet pastures. A few locally nesting mallards and cinnamon teals are present during the summer months.[49]
- 90% of the privately owned lands in the upper watershed is owned by eight landowners each of whom own at least 3,000 acres.[50]
- Coho salmon principally inhabit the Prairie Creek watershed in the northernmost section of the HU and in the tributaries of lower Redwood Creek, all within RNSP boundaries. No coho salmon were captured from the upper one-third of the Redwood Creek watershed during a downstream migrant study conducted for the years 2000, 2001, or 2002.[51] DFG's Recovery Strategy gives the lower Redwood Creek a top ranking in regard to management and restoration potential.

Threats

- Problems for coho salmon recovery in the Redwood Creek basin include: loss of critical habitat and periodic high temperatures in the estuary; elevated water temperatures in the mainstem and in tributaries due to lack of adequate canopy cover; reduction in habitat diversity by channel aggradation and lack of LWD; high fine-sediment loading; and high turbidity levels (in part from high road concentration in the watershed).[52]
- Forest fragmentation, related to road density and silvicutlural practices, can impact wildlife dispersal by altering suitable nesting, foraging and denning habitat. Continuing timber harvest and road construction on private lands upstream of park boundaries has led to concerns regarding

downstream impacts. In the past, increased erosion and sedimentation affected downstream park resources through elevated stream temperatures, disrupted aquatic habitat, and increased flood risk. Cooperative erosion control efforts are ongoing, to reduce the potential for damage in the next large flood.[53]

- The Redwood Creek estuary has been drastically affected by the construction of large flood control levees but remains an important wetland and bird habitat.
- The August 2004 version of the Calfish Passage Assessment Database lists 94 potential barriers to fish passage in the Redwood Creek watershed. Redwood Creek is listed under the federal Clean Water Act 303(d) as impaired for sediment and temperature.

Priority Conservation Sites from Selected Plans

The number of overlaps of priority areas from the selected conservation plans confirms that the lower Redwood Creek drainage—already in public ownership and management as Prairie Creek Redwoods State Park and Redwood National Park—as one of the premier natural resource areas on the North Coast. The entire lower watershed, including private agricultural areas along the Redwood Creek estuary, is marked as a top priority in the following planning documents: TNC's Aquatic Recommendations, DFG's Recovery Strategy, TNC's Ecoregional Plan, and Save-the-Redwoods League's Focal Areas. In addition, TNC has identified the headwaters of Redwood Creek as one of its portfolio areas, with special attention to Pacific fisher and northern spotted owl habitat.

General Action Recommendations

- Vigorous aquatic habitat conservation measures are recommended in many of the plans, with special attention on: streamside and riparian buffering; LWD recruitment and retention; management to promote conifer recruitment; improvement of existing riparian zones through plantings, release of small suppressed conifers, and control of alders, blackberries, and other competitors; and management incentives for private landowners.
- Encourage assessment of sediment sources and implementation measures, paying particular attention to road improvement projects and near-stream land-use planning in regard to sediment delivery.
- Protect existing LWD recruitment potential through retention of mature trees in the riparian zone, establishing adequate near-stream buffer areas protected from vegetation removal, and increasing the amount of in-channel LWD.
- Green Diamond Resource Company is the largest private landowner, which provides a stewardship opportunity to cooperate with one entity instead of a checkerboard ownership pattern.

Site-specific Action Recommendations

Aquatic[54]

- Work with landowners to restore the historic form and function of the Redwood Creek estuary andlagoon and slough channels, riparian forests, and adjacent wetlands. This includes providing for unconfined channels, natural drainage patterns from adjacent wetlands, improvement of estuarine slough and tributary conditions (in Strawberry, Dorrance and Sand Cache creeks), and restoration of riparian vegetation, tree cover, wetlands, and off-channel and rearing habitat.
- Work with the US Army Corps of Engineers, Redwood National and State Parks, and the Humboldt County Planning Department to modify levee maintenance manuals to be consistent with habitat requirements of coho salmon while maintaining flood control.
- Protect existing LWD recruitment potential through retention of mature trees in the riparian zone, establishing adequate near-stream buffer areas protected from vegetation removal, and increasing the amount of in-channel LWD.

Terrestrial and Wetland [55]

- Pursue cooperative management agreements among public agencies (especially the Corps of Engineers) for Redwood Creek estuary, leading to levee reduction and/or widening of the levees to allow for greater meander potential.
- Pursue cooperative agreements with private landowners to protect or enhance wetland and wildlife values.
- Restore and enhance floodplain riparian forests on public lands in or adjacent to Redwood Creek.

Coastal Trail, Public Access and Recreation[56]

- Improve the Highway 101 corridor for non-motorized travel (near Orick).

Data Gaps

Data gaps for the Redwood Creek HU include:

- Assessment of sediment sources and implementation measures, with particular need for attention to road improvement projects and near-stream land-use planning in regard to sediment delivery.[57]
- Identification and prioritization of oak woodland habitat.

Local Planning Information *(see Catalogue, Appendix 1)*

- *Lower Redwood Creek and Estuary Feasibility Study*—California State Coastal Conservancy
- *Redwood Creek North Coast Watershed Assessment Program (NCWAP)*—California Resources Agency, California EPA

Trinidad Hydrologic Unit

Stone Lagoon *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Setting

The Trinidad HU is home to one of the most important sets of coastal lagoons on the North Coast. Freshwater, Big, Dry, and Stone lagoons feature reinvigorated wetlands among former dairy lands within Humboldt Lagoons State Park. The HU also includes the Little River drainage and coastal streams from Strawberry Creek north to Freshwater Lagoon, whose forested upper drainages extend nearly ten miles inland and rise to over 2,500 feet in elevation.

The Trinidad HU is one of the most private and completely timber industry-dominated HUs in the North Coast, with over 79 percent of land managed for timber production. Public ownerships comprise only 6.3 percent of its 83,771 acres (104 mi^2) and include Humboldt Lagoons and Patrick's Point state parks, as well as Trinidad and Little River state beaches. The coastal lagoons and associated watersheds are managed by the DFG, California Department of Parks and Recreation (DPR), Humboldt County Parks, Green Diamond Resource Company, Big Lagoon Rancheria, Redwood Trails (a private campground), and numerous small landowners.[58]

Highway 101winds its way along the coast toward Arcata to the south, passing through the small communities of Trinidad and Westhaven.

Resources

- The Trinidad HU is dominated by redwood habitat, with small complements of montane hardwood and riparian composition. It also includes small stands of Sitka spruce, some of the northern-most stands of bishop pine, and a complement of northern coastal scrub, northern dune scrub, and northern foredune grassland, as well as sphagnum bog.[59]
- As the HU is entirely within the zone of summer fog intrusion, vegetation reflects a strong coastal influence. Special status plant species include: beach layia, pink sand-verbena, Wolf's evening-primrose, sand pea, Mendocino coast Indian paintbrush, dark-eyed gilia and deceiving sedge. Important wildlife species include tidewater goby and western snowy plover.[60]
- Freshwater Lagoon, located just north of Stone Lagoon, is the only continually fresh lagoon in the Unit; a water control structure, placed to regulate water flow, prevents saltwater intrusion. Significant numbers of waterfowl and other water-associated birds use the lagoon from August through April; a 1990-91 survey documented more than 370,000 annual bird-use days.[61] Blocked by the water control device, anadromous fish can no longer enter Freshwater Lagoon.[62]
- Stone Lagoon is formed by a barrier dune that is periodically breached, allowing water levels to drop considerably. Only one perennial stream (McDonald Creek) drains into Stone Lagoon. These wetlands are used by significant numbers of waterfowl and other water-associated birds from fall to spring. Over 670,000 average annual bird-use days were recorded during aerial censuses from 1970 to 1973. Salmon, steelhead trout, and coastal cutthroat trout use the lagoon and its tributary.[63]
- The largest of Humboldt County's coastal lagoons is Big Lagoon, including about 1,470 acres of open water and marsh. Like Stone Lagoon, it is periodically breached and partially drained. Sago pondweed and wigeon grass form dense submergent stands in some areas. Big Lagoon attracts thousands of waterfowl, shorebirds, and many other water-associated birds; a 1990-91 survey documented more than 360,000 annual bird-use days. In addition, Big Lagoon and its tributaries support coho salmon, Chinook salmon, steelhead trout, and coastal cutthroat trout.[64]
- Just south of Big Lagoon is one of the region's dune systems, forming a crescent-shaped mass perched upon 60-meter cliffs. These older dunes have stabilized and today are largely forested.[65]
- Little River is a relatively small coastal drainage that enters the Pacific Ocean about six miles north of Mad River. The river meanders through a flat coastal floodplain covering approximately 900 acres eventually entering a 30-acre estuary. Over much of its length, the riverbanks are densely vegetated with willow and alder. Seasonal flooding of the pasturelands provides habitat for moderate numbers of waterfowl and shorebirds. Little River supports runs of coho salmon, Chinook salmon, steelhead trout, and coastal cutthroat trout.[66] One of the most important western snowy plover nesting sites on the North Coast occurs near the mouth of Little River.[67]
- Timber production is the major economic activity in the Trinidad HU. The drainage beyond the estuary is owned by Green Diamond Resource Company, which is harvesting second-growth trees through even-aged management practices.[68]

- Although the current coho salmon population in the Little River drainage is depressed compared to historic estimates, numbers are believed to have been relatively stable over the last decade. Habitat conditions within the lower Little River drainage are heavily modified, with most of the estuary confined between low levees to accommodate adjacent agricultural activities. Where present, the canopy in this lower riparian zone consists of a narrow strip of willows and some alders.

Threats

- The presence of anadromous salmonids in coastal lagoon streams depends on the winter timing of lagoon sand bar breaches. In some years flows are not sufficient to breach the sand bars, and salmon are prevented from entering their natal streams.
- Problems for coho salmon recovery in the Trinidad HU include: high levels of instream fine sediment; stream channel aggradation; lack of instream LWD; insufficient levels of recruitable conifer LWD; poor estuary conditions (especially sedimentation); and existence of barriers to anadromy.[69]
- Exotic plants such as European beach grass and aquatic weeds threaten Freshwater Lagoon[70] and Little River State Beach.
- The August 2004 version of the Calfish Passage Assessment Database lists 55 potential barriers to fish passage in the Trinidad HU.

Priority Conservation Sites from Selected Plans

While the Trinidad HU as a whole exhibits a relatively modest suite of selected conservation priorities, there is a cluster of conservation resources in the northern section of the Unit encompassing a series of important coastal lagoons. Here, priority California Coastal Trail segments and priority PCJV wetlands coincide with both TNC and Save-the-Redwoods League terrestrial interest areas. Coho salmon have historically occurred in Stone Lagoon and Big Lagoon and their major tributaries, as well as Little River and its tributaries and Strawberry Creek. While TNC has not selected the Trinidad as an overall priority salmonid basin, DFG has noted the Little River drainage as a top priority for coho salmon restoration and management, due to both a greater consistent presence of coho salmon and the potential for re-opening access to presently disconnected habitat.

General Action Recommendations

No general action recommendations were identified in plans reviewed.

Site-specific Action Recommendations

Aquatic[71]

- Work with Humboldt County and landowners to maintain floodplain capacity and prevent future encroachment on the floodplain.

- Continue to work in the Big Lagoon area with private landowners to develop riparian buffers with an adequate conifer component and canopy closure, to reduce temperatures, increase LWD, and provide sediment filtration.
- Develop a plan to restore the historic flood plain on Mill Creek (a.k.a. Pitcher Creek), in cooperation with landowners.
- Develop a plan to improve the functioning of the lower Little River estuary, reestablishing conifers and a functional floodplain and riparian zone on the lower river channel and reestablishing more complex instream habitat. The plan should include exclusion fencing and riparian planting.
- Work with landowners to minimize the impacts of agricultural activities on the Little River estuary.

Terrestrial and Wetland[72]

- Continue existing management practices for Freshwater Lagoon, Big Lagoon, and Stone Lagoon.
- Pursue cooperative management agreements with private landowners near McDonald Creek to protect wetland and wildlife values in McDonald Creek and Stone Lagoon.
- Acquire additional shoreline and wetland acreage from willing sellers to consolidate public ownership, especially of wetlands east of Highway 101 at Big Lagoon.
- Pursue cooperative management agreements with private landowners to protect, restore, or enhance wetland and wildlife values at the Little River estuary.
- Restore and enhance wetland and wildlife values on public lands in or adjacent to Little River, especially floodplain riparian forest.
- Acquire land along the Little River from willing sellers for restoration or enhancement purposes.

Coastal Trail, Public Access and Recreation[73]

- Design and construct trail alignments along Guyon Bluffs.
- Improve the Little River Bridge crossing for non-motorized travel.
- Connect the Hammond Tail from Scenic Drive to Clam Beach County Park.

Data Gaps

Data gaps for the Trinidad HU include:

- Assessment of barriers to passage for anadromous fishes.
- Assessment of terrestrial species on managed timberlands.

Local Planning Information *(see Catalogue, Appendix 1)*

None identified

Mad River Hydrologic Unit

Lower Mad River, Mad River Beach *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

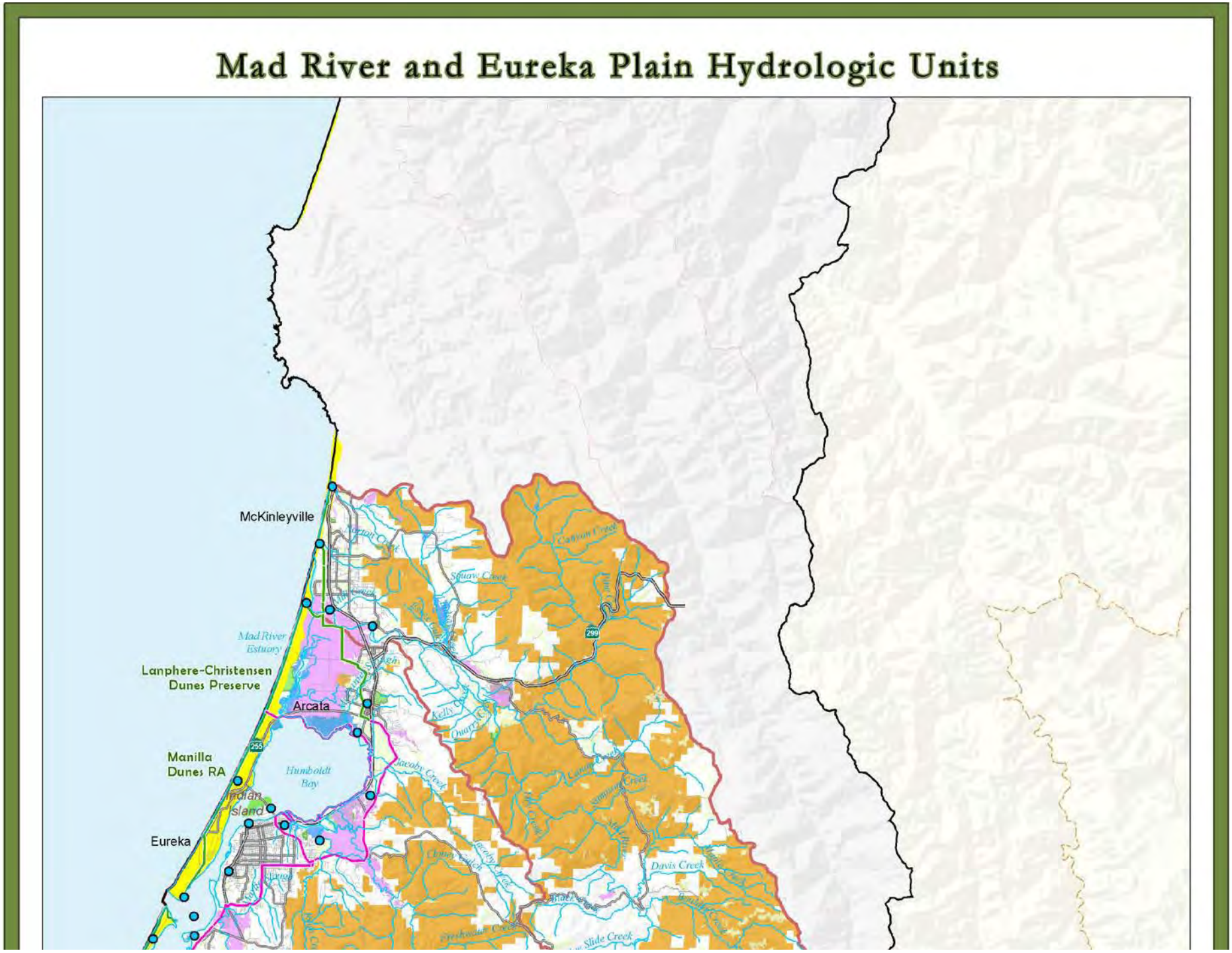
Setting

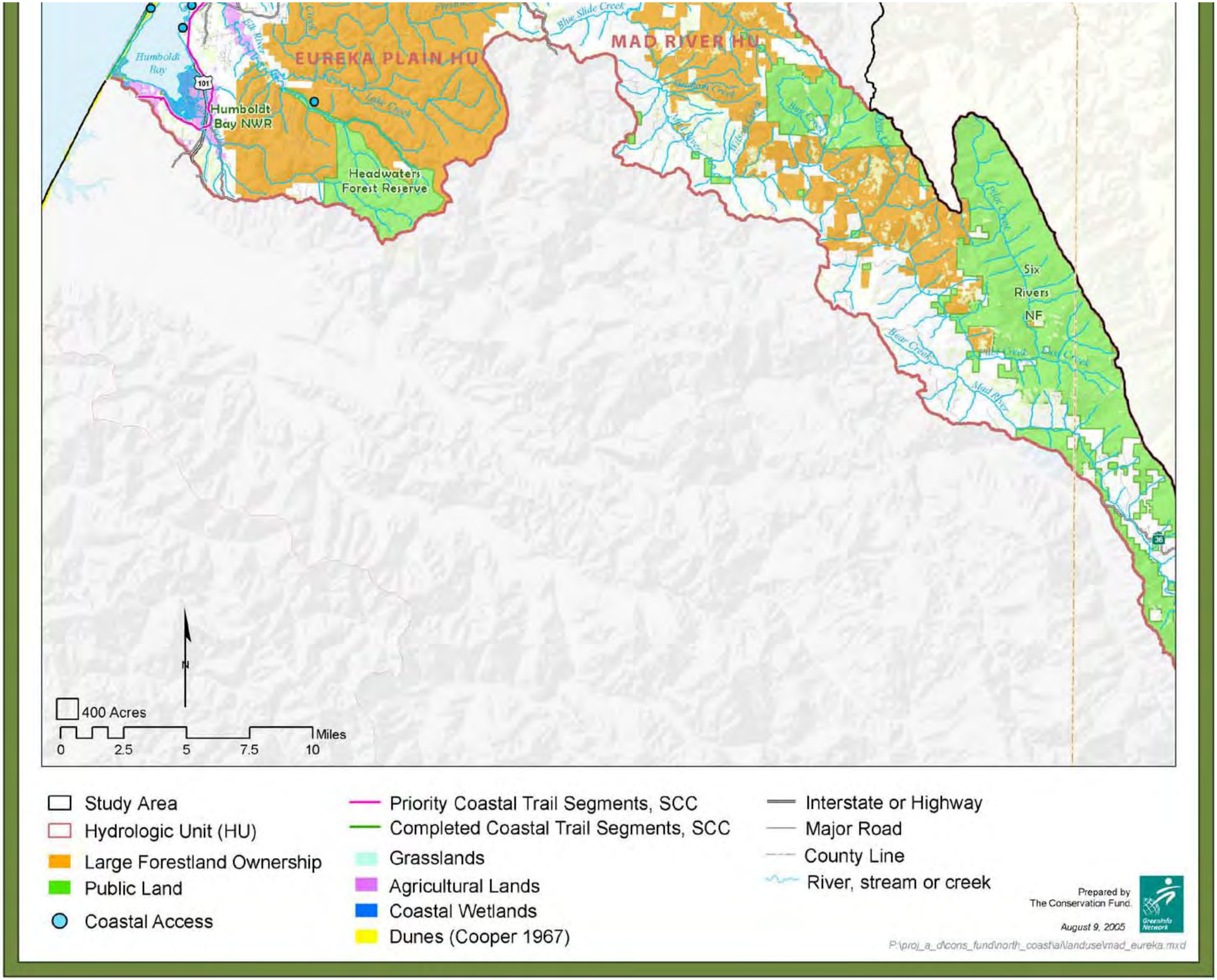
The Mad River runs its narrow course northwest through 80 miles of the rugged Coast Ranges from an inland composition largely of Douglas fir to redwood-dominated natural communities nearer the River's mouth. The watershed rarely attains a width of ten miles yet drains an area of approximately 322,199 acres (503 mi2). About 85 percent of the Mad River runs free, largely below its single dam (at Ruth Reservoir).

BLM and the USFS manage 36 percent of the watershed, with the largest area of public ownership occurring in the Six Rivers National Forest. Half of the remaining land is in private ownership, and half of this is owned by two timber companies. Gravel mining operations are present on the lower Mad as it approaches the coastal plain.

The Mad River HU is sparsely populated beyond the coastal plain surrounding Humboldt Bay, where urban development spreads along Highways 101 and 299 between the communities of McKinleyville (pop. 13,600) and Blue Lake (pop. 1,131).

Figure 4: Mad River and Eureka Plain Hydrologic Units Map





Humboldt Bay
101
Humboldt Bay NWR
EUREKA PLAIN HU
Elk River
Lake Creek
Headwaters Forest Reserve
Blue Slide Creek
MAD RIVER HU
Mad River
Pilot Creek
Six Rivers NF
Bear Creek
36
400 Acres
0 2.5 5 7.5 10 Miles
N
Study Area
Hydrologic Unit (HU)
Large Forestland Ownership
Public Land
Coastal Access
Priority Coastal Trail Segments, SCC
Completed Coastal Trail Segments, SCC
Grasslands
Agricultural Lands
Coastal Wetlands
Dunes (Cooper 1967)
Interstate or Highway
Major Road
County Line
River, stream or creek
Prepared by The Conservation Fund.
August 9, 2005
GreenInfo Network
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Resources

- Due to its inland reach, the Mad River hosts a higher complement of Douglas fir forest than redwood community or montane hardwood types, with significant percentages of annual grasslands and mixed and montane chaparral.[74]
- Special wildlife species include northern spotted owl, bald eagle, western snowy plover and red tree vole. Rare plants include beach layia, Howell's montia, and Siskiyou, maple-leaved and coast checkerblooms. [75]
- The Mad River Estuary is located 21 kilometers (13 miles) north of the entrance to Humboldt Bay. The estuary is not extensive and covers only about 120 hectares (300 acres) of open water, tidal flats, and river bars. Remnant floodplain riparian forest stands occur in a few locations along the lower river. About 1,200 hectares (3,000 acres) of pasturelands lying to the south of the river provide significant habitat for many water-associated birds when shallow flooding occurs during the rainy season. These pasturelands are contiguous with similar habitats near Humboldt Bay and attract thousands of waterfowl and shorebirds. They are also important foraging areas for egrets, herons, and the state-listed and recently federally de-listed peregrine falcon. The Mad River supports runs of coho salmon, Chinook salmon, and steelhead trout.[76]
- Important tributaries to the Mad River that support annual runs of coho salmon include Lindsay Creek and Canyon Creek in the lower watershed; the far upper watershed appears not to have supported salmon historically.
- The Mad River's private forests occur mainly along the lower stretches of the river (in the northwest), with major holdings by Green Diamond Resource Company. Forestland in the upper reaches of the HU is in National Forest ownership.

Threats

- There has been an estimated decline in Mad River coho salmon populations of at least 70 percent over the last 40 years. Problems for coho salmon recovery in the Mad River basin include reduction in habitat diversity by aggradation and lack of LWD, high fine sediment loading (in part from high road concentration in the watershed), and high water temperatures throughout the basin.[77]
- Timber harvest practices that do not allow for full ecological function of coastal forests remain among the most significant threats to species on private timberlands.
- The August 2004 version of the Calfish Passage Assessment Database lists 204 potential barriers to fish passage on the Mad River and its tributaries. The Mad River is listed as impaired on the federal 303(d) list of the Clean Water Act due to sedimentation, temperature, and turbidity.
- Coastal development and rural sprawl are a recognized threat along the lower estuary and coastal plain.[78]

Priority Conservation Sites from Selected Plans

The Mad River HU shows relatively fewer overlaps of significant conservation resources, with priority overlaps occurring only among DFG's Recovery Strategy and TNC's Ecoregional Plan. The middle stretches of the Mad River (the Butler Valley Hydrologic Sub-Area) from Canyon Creek to the Humboldt County border) are considered by DFG as having highest potential for the restoration and management of coho salmon, while TNC's Aquatic Recommendations considers the Mad River a low overall regional priority for North Coast salmonids.

Overlaps between the DFG Recovery Strategy priority sites and TNC terrestrial priorities occur in the area between Boulder Creek and the Mad River to Bug Creek, as well as within the Pilot and East Creek drainages within the Six Rivers National Forest (SRNF). The first area includes land largely within Green Diamond Resources Company ownership as well as a portion of the SRNF, and it includes both northern spotted owl habitat as well as examples of upland Douglas fir forest.

General Action Recommendations

- Work with landowners and other entities to reduce coho salmon tributary stream temperature through: the development of mature coniferous overstory within the riparian zone by continuing planting programs in stream corridors barren of mature conifers; THP review; and riparian management projects with cattle ranchers.
- Work with the State Water Resources Control Board (SWRCB) to make this HU a high priority for a) review of authorized diversions that have no provisions to protect coho salmon, and b) identification of unauthorized diversions and enforcement actions to stop them.
- Encourage SWRCB to adopt measures to protect riparian vegetation for all development over which they have jurisdiction.
- Focus on reducing road sediment impacts, including identifying sources of sediment, reducing road densities, decreasing potential for stream flow diversions at road crossings during high flow, and stabilizing roadside slopes.

Site-specific Action Recommendations

Aquatic[79]

- Develop a plan to restore and maintain tributary and mainstem habitat connectivity where low flow or sediment aggradation is restricting coho salmon passage, focusing on the mouths of Canyon Creek, Dry Creek, and North Fork Mad River.
- Continue stream management activities with landowners in Lower Lindsay Creek.
- Encourage landowners, municipalities, and tribal interests to work together to develop a watershed restoration plan in the Blue Lake sub-basin.

Terrestrial and Wetland [80]

- Pursue opportunities with private landowners and the McKinleyville Community Services District for wetland enhancement on agricultural lands.

- Pursue cooperative management agreements with Humboldt County and the California Department of Transportation for protecting estuarine habitat values, as well as local landform stability for the lower river.

- Pursue cooperative management agreements with the McKinleyville Community Services District and Humboldt County to protect estuarine habitat values and other instream values in the estuary and local creeks as development occurs in McKinleyville.

- Restore and enhance wetland and wildlife values on public trust lands in and adjacent to the lower Mad River, especially floodplain emergent wetlands, floodplain riparian forests, and instream habitat.

Coastal Trail, Public Access and Recreation[81]

- Complete the extension of the Hammond Trail from the Mad River bridge south, developing links to Arcata and Eureka.

- Restore the Hammond Trail pedestrian/ bicycle bridge across the Mad River.

Data Gaps

Data gaps for the Mad River HU include:

- Complete assessment of barriers to fish passage, prioritization of barriers for removal, and planning for treatment of barriers. Warren Creek should be given a high priority for treatment.

- Review, in collaboration with SWRCB, of authorized diversions that have no provisions to protect salmonids, as well as identification of unauthorized diversions and enforcement actions to stop them.

- Evaluation of the impact of the Mad River Hatchery steelhead production on coho salmon.

- Identification and prioritization of oak woodland habitat.

Local Planning Information *(see Catalogue, Appendix 1)*

- *Six Rivers National Forest Land and Resource Management Plan*—USDA Forest Service

- Clam and Moonstone Beach County Parks Management Master Plan—Humboldt County Department of Public Works

Eureka Plain Hydrologic Unit

Lanphere-Christensen Dunes Preserve *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Setting

The 141,190 acres (221 mi^2) of the Eureka Plain HU encompass the corrugated redwood forests of the Elk River, the prime agricultural lands in the rich alluvial valleys , and high-quality riparian and wetland habitat leading to the tidal marshland of the bay. The majestic 16,000-acre Humboldt Bay, separated from the ocean by 15 miles of narrow sand spits, provides the centerpiece to the HU. It is the largest estuary between San Francisco Bay and Coos Bay, Oregon, and the second most productive bay in California.[82]

The Eureka Plain is one of the more urbanized regions of the North Coast, with over 16 percent of the entire HU in either urban or agricultural uses. The HU also contains large expanses of highly productive timberland, with 42 percent of the land area owned and managed by industrial timber companies. Only 9.2 percent of the watershed is public, largely DFG and U.S. Fish and Wildlife Service holdings surrounding the bay and BLM's 7,400-acre Headwaters Forest Reserve.

The area is the largest population center of the North Coast, with the cities of Eureka (pop. 26,128) and Arcata (pop.16,651) situated on the northern and eastern sides of the bay, along Highway 101. Eureka is a major seaport and base for the region's important fishing industry, while Arcata is home to Humboldt State University and the regional airport near McKinleyville.

Resources

- The majority of the upper Eureka Plain watershed is heavily forested by coast redwood, with very little area dominated by Douglas fir; urban, agricultural and grassland cover types account for most of the rest of the HU.[83] The upper watersheds are heavily forested and include the spectacular Headwaters Forest Reserve—a 7,400-acre parcel containing a 3,000-acre stand of old-growth redwood and Douglas fir Forest. The reserve, a Bureau of Land Management "Special Management Area," is part of the recently created National Landscape Conservation System and provides critical habitat for the marbled murrelet and other sensitive species.[84]
- Special status wildlife species in the HU include tidewater goby, California clapper rail, peregrine falcon, and western snowy plover, as well as populations of northern red-legged frog, southern torrent salamander, northern spotted owl, marbled murrelet, and red tree vole.
- Endangered plants include beach layia, western lily, and Menzie's wallflower, as well as examples of minute pocket-moss, sand pea, Howell's montia, Siskiyou and coast checkerbloom, and western sand-spurrey.[85]
- Humboldt Bay, the Mad River estuary, and the Eel River delta function as a single habitat complex, providing at least 8,000 hectares (20,000 acres) of low-lying seasonal wetland (diked former tideland); 8,000 hectares (20,000 acres) of tidal marsh and intertidal flat; and at least 1,800 hectares (4,500 acres) of tidal channels, sloughs, and other deep-water estuarine habitats. The bay's extensive open water, tidal flats, eelgrass beds, and salt marshes attract hundreds of thousands of migratory waterfowl, shorebirds, and other water-associated birds, including the Aleutian goose. The bay is particularly important for brant because of its extensive and productive eelgrass beds.[86]
- Humboldt Bay provides a rich and diverse mixture of natural habitats, including tidal marsh, intertidal flats, tidal channels, sloughs, deep-water estuarine habitats, and eelgrass beds. The bay and its shore provide habitat for 141 invertebrate species, 110 fish species, and 251 bird species. Over 100,000 birds are believed to over-winter at the bay each year.[87]
- Humboldt Bay is also an important haul-out and pupping area for hundreds of harbor seals. Ninety-five species of fish occur in the bay, including anadromous species that use bay tributaries for spawning.[88]
- The coastal dune system stretching along 34 miles of coast to the north and south of Humboldt Bay contains over 5,000 acres of dune forest, vegetated dunes and open sand.[89] This dune system is recognized as the most complete and least disturbed dune ecosystem on the West Coast of the United States.[90] The North Spit is the most mature dune system, with the greatest intact areas of native dunegrass and dune mat protected within the Lanphere-Christensen Dunes Preserve. The dunes to the south are younger and less developed, with fewer native communities.[91]
- Forest resources in the Eureka Plain HU are concentrated under large industrial timber ownerships with holdings over 41 percent of the watershed. Major ownerships include Pacific Lumber Company, Sierra Pacific, and Green Diamond Resource Company.

Threats

- Identified impairments to salmonid habitat in the Humboldt Bay watershed include: high instream sediment levels; stream channel aggradation and widening; lack of stream habitat structure (i.e., deep pools); high water temperatures; and loss of functioning estuary habitat.[92]
- Simplification of the stream channels has decreased the quantity and quality of aquatic habitat. Human-made obstructions to upstream and downstream migration frequently restrict access of adult and juvenile salmonids to spawning and rearing habitat. Culverts and tide gates have been identified as fish passage barriers.
- Exotic species such as Chilean cordgrass, yellow bush lupine and European beach grass are displacing native species and altering habitats. BLM, DFG, and the community of Manila are all working on exotic species control.[93]
- The August 2004 version of the Calfish Passage Assessment Database lists 125 potential barriers to fish passage within the Eureka Plain HU. Humboldt Bay is listed as impaired on the federal 303(d) list of the Clean Water Act due to PCBs.
- Coastal development and rural sprawl are recognized threats along the lower estuary and coastal plain. [94]

Priority Conservation Sites From Selected Plans

With its compact geography and active local citizenry, the Eureka Plain HU has become a focus for many types of conservation activity, and there are a number of overlapping conservation priorities identified in the various plans synthesized here. These overlaps are concentrated in two general locations within the HU. First, protection of redwood forest lands owned by Green Diamond Resource Company and Pacific Lumber Company in the upper Salmon, Elk and Freshwater creeks is a priority of TNC, DFG, and Save–the-Redwoods League. This reflects an emphasis on older forest riparian zones with high canopy cover, lower road densities, ease of fish passage and presence of deep pool cover for coastal cutthroat and coho salmon, and specialized habitats for northern spotted owl and marbled murrelet. A second coincidence of priorities focuses on Humboldt Bay, with a series of identified estuarine, seasonal wetland, dune, and California Coastal Trail priorities. In particular, plans here have emphasized organizations working cooperatively outside of preserve boundaries with private agricultural and residential landowners to ensure adequate levels of comprehensive protection for the bay's resources.

General Action Recommendations[95]

- Conduct an inventory and prioritize for treatment migration barriers other than county culverts (private roads, tide gates), including at Rocky and Washington gulches.
- Develop site-specific riparian restoration plans to restore degraded riparian habitat, and establish a monitoring program to evaluate success of restoration projects.

- Review recent habitat surveys, and identify gaps in data; conduct habitat surveys in areas identified as lacking data.
- In cooperation with willing landowners, restore and maintain historical tidal areas, backwater channels, and salt marsh.
- Maintain, protect, and restore channel conditions important to all life stages of coho salmon (e.g., spawning gravels, pool depth, rearing gravels, food) as they relate to bed load.
- Conduct hydrologic analyses for all Humboldt Bay tributaries.
- Upgrade all county culverts already identified as passage barriers and prioritized for repair.
- Conduct LWD surveys, identifying location and areas for potential recruitment and/or placement of LWD structures: a) map areas where large conifer riparian habitat exists; b) increase the canopy by planting appropriate conifer and hardwood species composition along streams where the canopy is not at acceptable levels (in many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects); c) protect existing LWD structure; d) increase the amount of LWD in rearing reaches; e) provide additional LWD for rearing habitat; f) ensure retention of mature trees in the riparian corridor; g) establish adequate streamside buffer areas that are protected from vegetation removal; h) protect and maintain habitat associated with instream LWD.
- Reduce input of fine sediments into the stream system by the following actions: a) conduct comprehensive road inventories; b) implement priority road-related sediment reduction plans; c) identify areas calling for road/erosion inventories; d) identify ongoing road maintenance needs; e) identify landslide hazard areas, such as steep unstable slopes, stream crossings (other than those identified in the road inventory), and inner gorge areas; f) conduct pre-project geological surveys and/or reduce management activities within these areas, especially road construction, grading, and intensive timber harvests; g) identify and treat bank erosion sites.
- Assess and establish temperatures beneficial to coho salmon during all life stages by: a) evaluating temperature ranges in all tributaries; b) reviewing existing temperature data; c) identifying data gaps and establishing a watershed-wide temperature monitoring program; and d) determining if temperatures are a concern for coho salmon.
- Determine and maintain adequate flows for migrating juvenile and adult coho salmon. Develop an inventory of current water rights, and conduct a field survey of water withdrawals in the main stem and tributaries.
- Acquire land from willing sellers for wetland restoration or enhancement purposes.
- Pursue restoration of former tidal wetlands where feasible and appropriate.
- Work with local, state, and federal agencies to ensure that mariculture activities are compatible with wildlife values within tidelands of Humboldt Bay.

Site-specific Action Recommendations

Aquatic[96]

- Support and encourage urban stream day-lighting efforts in Arcata and Eureka to reconnect and restore coho salmon habitat.
- Support implementation of Humboldt County's provisions to protect Stream Management Areas and evaluate their effectiveness; recommend revisions as necessary.
- In cooperation with willing landowners, restore and maintain historical tidal areas, backwater channels, and salt marsh.
- Acknowledge the Arcata City Sewage Treatment Project, and encourage implementation of similar projects elsewhere, where possible.
- Upgrade all county culverts already identified as passage barriers and prioritized for repair.

Terrestrial and Wetland [97]

- Work with federal, state, and local agencies, conservation groups, the agricultural community, and others to develop a long-term, comprehensive plan for the restoration, enhancement and protection of Humboldt Bay and the Eel River delta.
- Implement the existing U.S. Fish and Wildlife Service plan for acquisition and management of lands with the approved boundary of the Humboldt Bay National Wildlife Refuge.
- Enhance wetland habitats and wildlife values on publicly owned wildlife areas managed by DFG.
- Work with local, state, and federal agencies to ensure that mariculture activities are compatible with wildlife values within tidelands of Humboldt Bay.
- Work with Humboldt County and the cities of Eureka and Arcata to ensure that wetland and wildlife values are protected as development occurs, particularly in the Martin Slough/Elk River, Freshwater Creek, Jacoby Creek, and Janes Creek drainages and on the North Spit.
- Work with the city of Eureka and individual landowners to restore/enhance wetland and wildlife values in the Eureka Marsh/PALCO wetland complex, the West End Road wetland complex and other wetlands within the city.
- Work with the County of Humboldt and individual landowners to enhance existing freshwater wetland values in the Fields Landing/King Salmon area and on the North Spit.
- Work with the Humboldt Bay Harbor, Recreation, and Conservation District to assure that wetland and wildlife values are protected on public trust lands as development occurs within improved harbor areas.

Coastal Trail, Public Access and Recreation[98]

- Extend the Hammond Trail through the City of Arcata.
- Improve non-motorized travel between Arcata and Eureka.
- Improve the Samoa Bridge for non-motorized travel.
- Investigate the feasibility of a water taxi across Humboldt Bay.
- Support the implementation of the Humboldt Bay Trails Feasibility Study to develop a continuous trail system around the east side of Humboldt Bay.
- Use the abandoned railroad right-of-way; develop the Annie and Mary Trail to encourage non-motorized access to the coast by linking Arcata with Blue Lake and other inland communities.
- Work with private landowners to acquire public access rights from willing sellers at several locations from Centerville Beach to Cape Mendocino.

Data Gaps

Data gaps for the Eureka Plain HU include:

- Inventory and prioritized treatment prescriptions of migration barriers other than county culverts (e.g., private roads and tide gates), including locations in Rocky and Washington gulches.
- Review of recent aquatic habitat surveys, including identification of data gaps; conduct habitat surveys in areas identified as lacking data.
- Hydrologic analyses for all Humboldt Bay tributaries.
- LWD surveys that identify locations for potential recruitment and/or placement of LWD structures and map areas where large conifer riparian habitat exists.
- Comprehensive road inventory to determine priority road-related sediment projects:; identify ongoing road maintenance needs; identify bank erosion sites; identify landslide hazard areas such as steep unstable slopes, stream crossings (other than those identified in the road inventory), and inner gorge areas, and conduct pre-project geological surveys and/or reduce management activities within these areas, especially road construction, grading, and intensive timber harvests.
- Develop an inventory of current water rights, and conduct a field survey of water withdrawals in main stems and tributaries to determine and maintain adequate flows for migrating salmon.
- Identify pollutants that are potentially affecting coho salmon, and identify priorities for pollution reduction and implementation strategies to be pursued.
- Identify and prioritize oak woodland habitat.

Local Planning Infomation *(see Catalogue, Appendix 1)*

- *Humboldt County Plan Update*—Humboldt County
- *Clam and Moonstone Beach County Parks Recreational Facilities and Resource Management Master Plan*—Humboldt County Department of Public Works - Parks Division
- *Arcata Community Forest and Jacoby Creek Forest Management Plan*—City of Arcata
- *City of Eureka–Gulches and Greenways Planning*—City of Eureka
- *Humboldt Bay Management Plan*—Humboldt Bay Harbor, Recreation and Conservation District
- *Humboldt Bay Trails Feasibility Study*—Redwood Community Action Agency
- *Humboldt Bay Watershed Salmon and Steelhead Conservation Plan*—Humboldt Bay Watershed Advisory Council and Redwood Community Action Agency
- *Humboldt Beach and Dunes Coordinated Resource Management Plan (CRMP)*—County of Humboldt and California State Coastal Conservancy
- *Humboldt Beach and Dunes Management Plan*—Humboldt County
- *Indian Island Enhancement Plan*—Humboldt Water Resources
- *Manila Dunes Recreation Area Trails Plan*—Manila Community Services District
- *Martin Slough Enhancement Plan*—Redwood Community Action Agency
- *McDaniel Slough Enhancement Plan*—City of Arcata Environmental Services Department
- *Total Maximum Daily Loads (TMDLS) for Elk and Freshwater Creek*—North Coast Regional Water Quality Control Board, U.S. EPA

Eel River Hydrologic Unit

Eel River Estuary *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Setting

The Eel River is the third largest river system in California, encompassing approximately 2,356,794 acres (3,682 mi^2) within six counties—primarily Humboldt, Mendocino, Trinity and Lake counties, plus small portions of Colusa and Glenn counties. As such, the Eel is by definition one of the most important landscape units in the North Coast—and one of the most difficult to manage. Within the Eel River watershed there are approximately 3,488 miles of streams that contribute to a mean annual discharge of approximately six million acre-feet. The major forks of the Eel include the North, Middle, Main, and South, as well as the Van Duzen River, Kekawaka, Outlet, Tomki, Dobbyns and Larabee creeks.[99] There are 16 segments of the Eel River designated wild, scenic, or recreational in accordance with the Wild and Scenic Rivers Act.

The HU is broken by the series of northwest-southeast ridges comprising this section of the Coast Ranges. High inland peaks, some over 7,000 feet tall, make up the region's eastern border, while three inland flat valleys (Laytonville, Willits, and Round Valley) offer a contrast to the steep ridges and closed canyons and provide important inland wetland and migratory bird habitats. The 33,000-acre Eel River delta is another of the North Coast region's significant wetland, riparian, and agricultural resource.

The majority of the Eel River watershed is rural, with a number of small towns scattered throughout the watershed. Larger towns are found only along the Highway 101 corridor stretching from Fortuna through Garberville, Redway, and Leggett to Willits. A remarkable 86 percent of

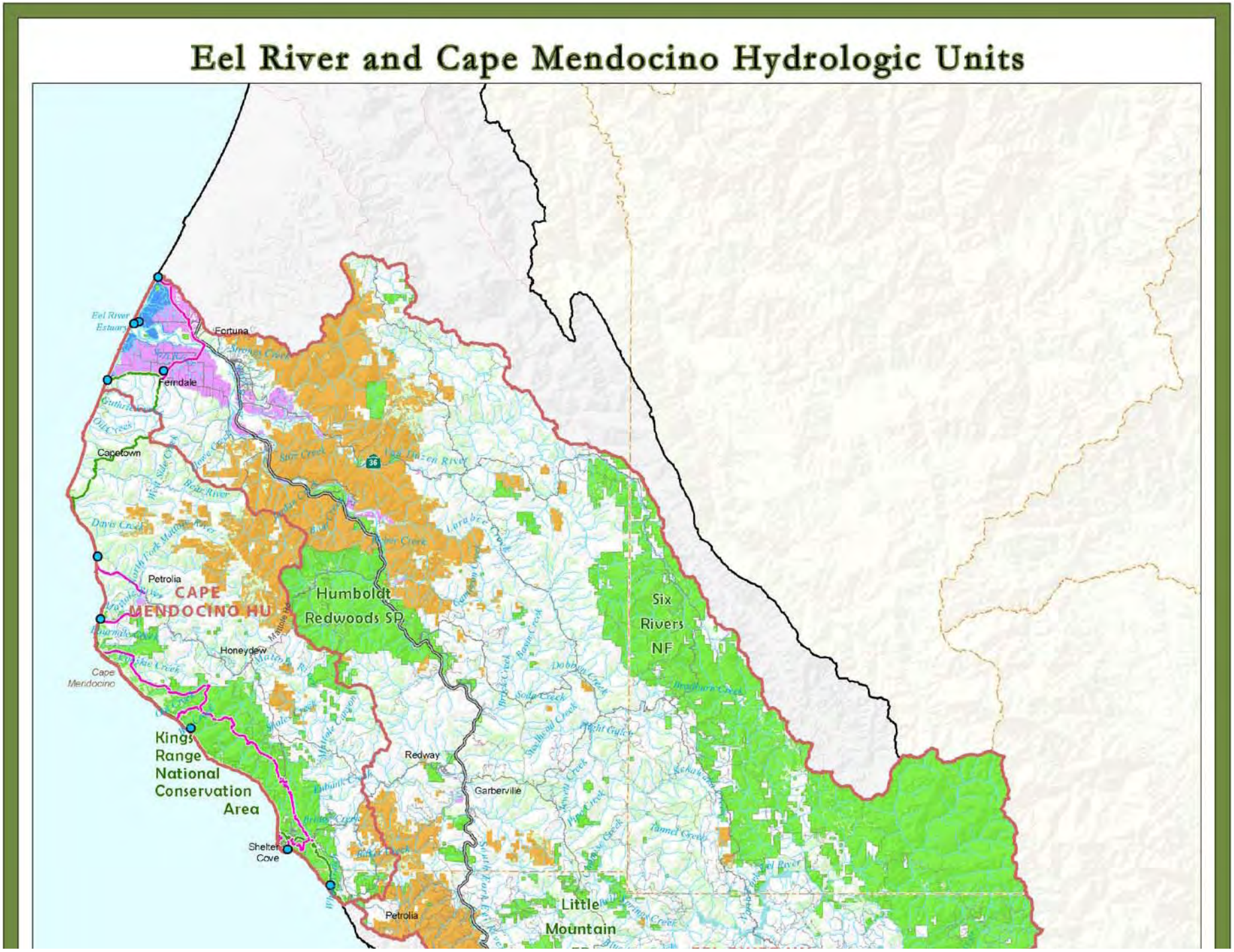
the Eel River watershed is held in private ownership, with nearly 300,000 of those acres (12.7 percent of the HU) under industrial timber management and an additional 11.8 percent identified within county designated Timber Production Zones (TPZ). Significant land uses in the watershed are timber production, grazing, agriculture, in-channel gravel mining, and recreation, as well as, to a lesser degree, subdivision and residential development.

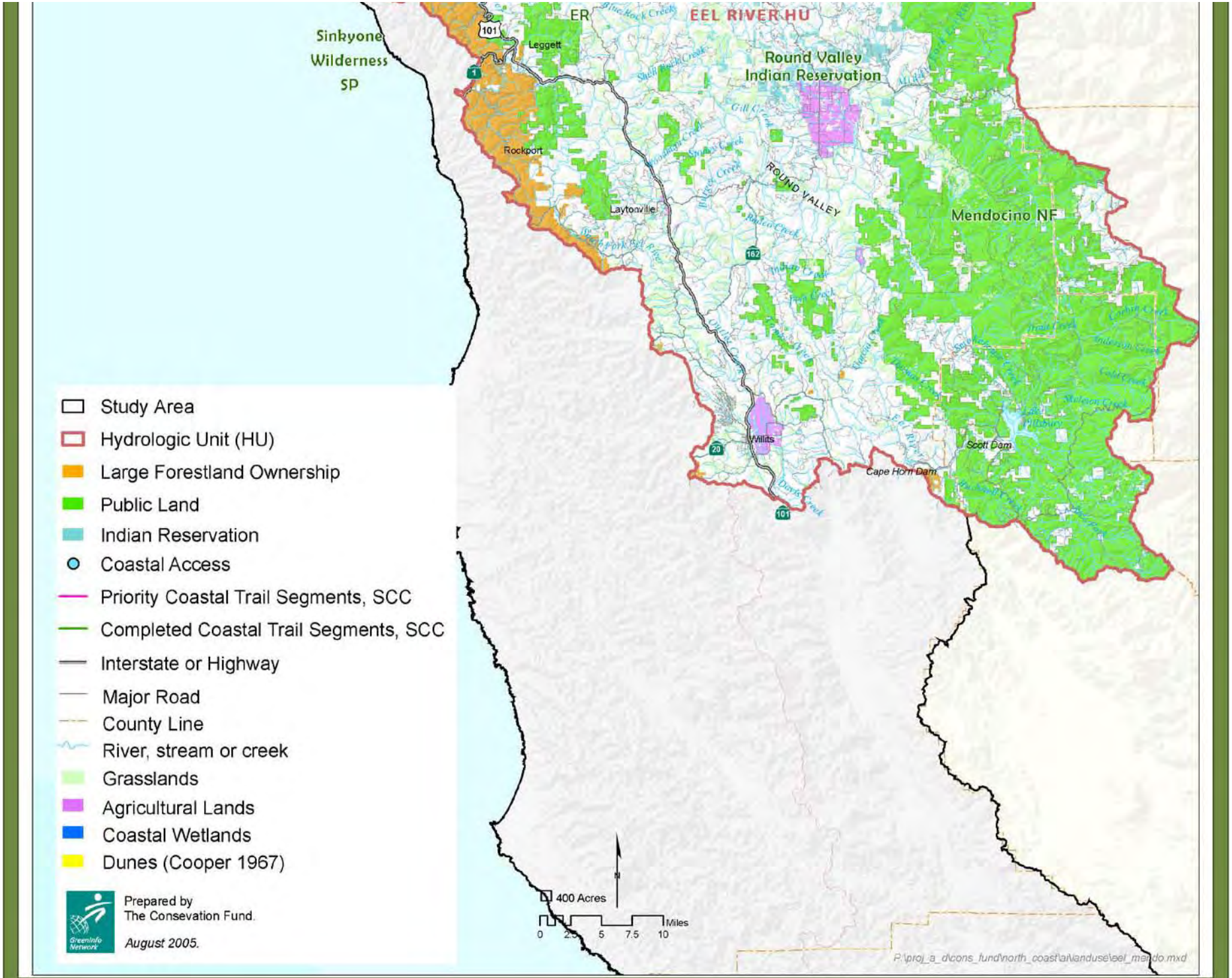
Public ownership is mainly national forest lands, with the Shasta-Trinity and Mendocino national forests bordering much of the region to the east, followed by one of the largest and oldest state parks in the region, Humboldt Redwoods State Park. The park includes in its 52,000 acres on the South Fork Eel some 17,000 acres of old-growth redwood forest. Other large public ownerships include over 100,000 acres of BLM lands, largely scattered through the South Fork drainage to the north and west of Laytonville.

Resources

- Due to its size and geographical diversity, the Eel River HU exhibits the broadest range of ecotypes in the North Coast. Like many HUs farther to the north, sections of the coastal mountains are dominated by redwood forest, which quickly grades to the east into mosaics of Douglas fir and montane hardwood. Additionally, annual grassland, montane, and mixed chaparral make up 19 percent of the HU.
- Specialized community types include Sitka spruce forest, blue oak woodland, Coast Range mixed coniferous, Coast Range Douglas fir–western hemlock forest, coastal terrace prairie, foothill pine-oak woodland, northern interior cypress forest, valley oak woodland, Oregon oak woodland, red fir forest, and North Coast black cottonwood riparian forest.[100]
- About 400 bird species are found in the Eel River watershed and around 80 species of mammals. Important terrestrial and avian wildlife species include: western snowy plover, marbled murrelet, northern spotted owl, great gray owl,[101] bald eagle, willow flycatcher, yellow warbler, Pacific fisher, red tree vole, and California wolverine and black bear, mountain lion, Roosevelt elk, and numerous black-tailed deer are dominant mammal populations in this region. Other wildlife includes mink, river otter, raccoon, coyotes, bobcats, bush and jackrabbits along with quail, grouse, morning doves and band-tailed pigeons.[102]
- Rare and endangered plants include: Macdonald's rock-cress, Humboldt milk-vetch, Kellogg's buckwheat, Milo baker's lupine, North Coast semaphore grass, kneeland prairie pennycress, two-flowered pea, Baker's meadowfoam, Drymaria-like western flax, Bolander's horkelia, Stebbins' lewisia, The Lassics lupine and sandwort, red mountain stonecrop, beaked tracyina, Anthony peak lupine, and Mendocino gentian.[103]
- Aquatic species of concern include: Chinook salmon, coho salmon, river lamprey, steelhead, chum salmon, southern torrent salamander, foothill yellow-legged frog, red-legged frog, tailed frog, and northwestern pond turtle.
- Humboldt Redwoods State Park contains the largest remaining contiguous old- growth redwood

Figure 5: Eel River and Cape Mendocino Hydrologic Units Map




ER
EEL RIVER HU
Sinkyone
Wilderness
SP
Leggett
Round Valley
Indian Reservation
Rockport
Laytonville
ROUND VALLEY
Mendocino NF
Willits
Scott Dam
Cape Horn Dam
Study Area
Hydrologic Unit (HU)
Large Forestland Ownership
Public Land
Indian Reservation
Coastal Access
Priority Coastal Trail Segments, SCC
Completed Coastal Trail Segments, SCC
Interstate or Highway
Major Road
County Line
River, stream or creek
Grasslands
Agricultural Lands
Coastal Wetlands
Dunes (Cooper 1967)
Prepared by
The Consevation Fund.
August 2005.
400 Acres
Miles
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forest remaining on earth (approximately 10,000 acres). There are also approximately six to eight thousand acres in the park of mixed redwood and Douglas fir forest.[104]

- The Eel River is one of California's most important spawning streams for coho salmon, Chinook salmon, and steelhead trout.[105] Eel River salmon and steelhead production is ranked third in the state. The estuary provides a nutrient-rich nursery environment where growth rates are superior to upstream nurseries for salmonids, marine fishes, and invertebrates.[106] Records indicate coho salmon were more widespread in the Eel River basin in the past, and recent surveys reflect a downward trend in many areas, including, in particular, a recent lack of presence in the Van Duzen.[107]

- The Eel River delta estuary remains open throughout the year. The wide river meanders through pasturelands and forms a delta that eventually breaks up into a network of tidal sloughs and saltwater bays. The flood-plain at the mouth covers 33,000 acres. Although much reduced by land clearing, substantial stands of floodplain riparian forests still can be found in scattered locations along the river and its tributary channels. Much of what were once extensive salt marsh and other intertidal habitat has been converted to farmland by dike construction. These lands still function as wetlands when flooded by winter rains. The mosaic of bays, tidal flats, sloughs, marshes, and seasonal wetlands supports hundreds of thousands of resident and migratory water-associated binds. The valued habitats are freshwater wetlands, salt marsh, slough, Sitka spruce forest, and coastal dune strands.[108]

- This wetland complex (especially the Eel River delta) contains approximately 400 hectares (1,000 acres) of floodplain riparian forest—a remnant of what was formerly a predominant wetland type in this region. This habitat type is recognized as one of the most important for migratory birds in Northern California.[109]

- Round Valley is 24 kilometers (15 miles) by air northeast of Laytonville along the Middle Fork of the Eel River. This 62,000-hectare (15,300 acre) interior valley historically had numerous small wetlands scattered throughout it. Many have been drained and leveled. The sloughs, creeks, seasonal wetlands, and winter pastures of Round Valley attract large numbers of wood ducks and up to 500 lesser Canada geese. The valley is important winter habitat for bald eagles, peregrine falcons, and other raptors, and occasionally large numbers of band-tailed pigeons winter in and around the valley when large acorn crops are present.

- Eden Valley is located on the Eden Creek tributary to the Middle Fork of the Eel River, 27 kilometers (17 miles) by air northeast of Willits. In single ownership, this 500-hectare (1,250 acre) valley is farmed for hay production. Canada geese, bald eagles, peregrine falcons, and tule elk use this valley. A large block of BLM land with some wetlands is found to the east of this valley.

- The 4,200-acre Little Lake Valley, situated northeast of Willits, represents one of the last good examples of interior wetlands found in the North Coast Range of California. The wetlands are a floodplain of the Eel River drainage and represent a significant staging area for waterfowl in early spring.

- Forest resources in the Eel River HU are widespread and scattered largely among medium-sized, non-industrial ownerships throughout the Middle and South forks of the river. Pacific Lumber Company holds a major ownership, over 200,000 acres, in the main stretches of the Eel and Van Duzen rivers to the east of Ferndale.

Threats

- The Eel River was recently listed as one of the nation's most endangered river systems.[110]
- Problems facing salmonids in the Eel River HU include impacts from approximately 10,000 miles of roads. Instream mining operations are located at number of sites in the watershed. Hydroelectric power production and water diversions and/or pumping also have a major impact. Scott Dam, built in 1921, is a barrier for all salmonids to the upper 29 miles of the mainstem Eel River and its tributaries. Cape Horn Dam, with a 9,258-foot long upstream tunnel, is 12 miles below Scott Dam.
- An annual average of 160,000 acre-feet of Eel River water has been diverted to the Russian River drainage. Artificial fish passage barriers exist at some road crossings of streams. High summer water temperatures are common in the mainstem and many of the tributaries.
- The most recent stream habitat surveys conducted by DFG indicate that many of the tributary streams have low diversity of stream habitat and complexity and lack canopy and LWD. Predation by non-native fish such as the Sacramento pike minnow may have a major impact on salmonids. The pike minnow have displaced salmonids in summer rearing streams.[111]
- Concerns within and around Humboldt Redwoods State park include: barriers created by the public road system, which reduce connectivity; aggressive logging practices nearby; marijuana cultivation; exotic species; loss of late successional vegetation; and alteration of fire regimes.[112]
- Subdivision of large ranches into rural housing threatens to fragment the landscape.
- Timber harvest practices that do not allow for full ecological function of coastal forests remain among the most significant threats to species on private timberlands.[113]
- The August 2004 version of the Calfish Passage Assessment Database lists 1,146 potential barriers to fish passage on the Eel River. Sections of the Eel River are listed as impaired on the federal 303(d) list of the Clean Water Act due to sedimentation and temperature.

Priority Conservation Sites From Selected Plans

While the Eel is a diverse and difficult region to address as a whole, a number of notable areas of overlapping priorities emerge from the synthesis of the seven regional plans. Overall, the plans attest to the fact that conservation of the Eel River as a complete system will be one of the most difficult challenges on the North Coast.

TNC's Aquatic Recommendations places lower Eel tributaries as a low priority for action, while the DFG Recovery Strategy lists only six out of 19 hydrologic subsections in the HU in its top

two categories for restoration and management potential. Already impacted by habitat fragmentation, destruction of spawning grounds, and elevated summer temperatures and sediment regimes, large sections of the river are not considered feasible for salmonid recovery.

General exceptions exist, however, in the South Fork Eel and Van Duzen rivers, as well as in the lower stretches of the mainstem. In particular, a significant region of overlap between priority forest and aquatic resources occurs on private timberlands in the Van Duzen drainage above Hydesville, containing Grizzly, Stevens, Root, Rogers, Fish, and Brown creeks. This area has known northern spotted owl and marbled murrelet nesting sites within its relatively older forest, as well as high suitability for Pacific fisher.

Two additional areas of overlap occur along the South Fork of the Eel, which is designated in TNC's Aquatic Recommendations as one of the top three focal areas for salmon in the North Coast; it is a crucial watershed for coho salmon, two runs of steelhead, and California coastal Chinook. The first of these areas of overlap centers on the Bull Creek Drainage within Humboldt Redwoods State Park. The second includes a broad band of the South Fork Eel in Mendocino County, along the Highway 101 corridor from Indian Creek southward to Elkhorn Ridge and Elder Creek. This overlap again reflects areas of older mixed evergreen and Douglas fir forest, with patches of upland Douglas fir forest and northern interior cypress forest, and habitat suitable for northern spotted owl and Pacific fisher.

General Action Recommendations

- Identify impacts from Van Arsdale outplanting site on coho salmon rearing.
- In cooperation with agencies and landowners, plan to reestablish estuarine functions and to restore and maintain historical tidal areas, backwater channels and salt marsh.
- Request that Caltrans assess, prioritize and treat culverts that are barriers to salmonid passage along Avenue of the Giants and Highway 101. Identify barriers to passage and prioritize them for removal through collaborative efforts with other agencies.
- To minimize and reduce the effects of water diversions, take actions to improve SWRCB coordination with other agencies to address: season of diversion; offstream reservoirs; bypass flows protective of coho salmon, other anadromous salmonids, and natural hydrograph; and avoidance of adverse impacts caused by water diversion.
- Prepare a technical assessment of Outlet Creek watershed, develop recommendations to restore its long-term function, and prioritize implementation.
- Work with federal, state, and local agencies, conservation groups, agricultural community, and others to develop a long-term plan for protection, restoration and enhancement of wildlife habitat that takes a comprehensive approach to Humboldt Bay and the Eel River delta.
- Acquire land from willing sellers for restoration or enhancement purposes.
- Maintain existing Eden Valley agricultural land uses through zoning.

- Work with Eden Valley landowners to pursue opportunities for cooperative wetland and riparian enhancement projects.

Site-specific Action Recommendations

Aquatic[114]

- Acknowledge that the pike minnow is a problem, and support efforts to control it.
- Recommend that the SWRCB adopt as high priorities the identification of unauthorized diversions and enforcement actions to stop them in the Eel River HU.
- Encourage the County of Humboldt's Extraction Review Team to incorporate measures favoring coho salmon.
- Develop a plan to restore an adequate migration corridor in the mainstem Eel River.
- Request that Caltrans assess, prioritize, and treat culverts that are barriers to salmonid passage on Highway 101.
- Encourage the Salt River Local Implementation Plan to incorporate coho salmon-friendly measures, in cooperation with the relevant agencies. For the Salt River Local Implementation Plan to be effective, assessment, prioritization, and treatment of sediment sources in the watershed must be completed.
- Support the acquisition of conservation easements in the lower Eel as an incentive for landowners to conserve and enhance habitat.
- Evaluate the benefits to coho salmon of removing the barrier on Bridge Creek.
- Support the DPR's efforts to complete the storm-proofing of Bull Creek watershed.
- Support tree planting by DPR and private property owners, and implement other habitat enhancement as necessary in the Bull and Salmon creek watersheds.
- Request that the CDF monitor Non-industrial Timber Management Plans (NTMPs) within the Benbow HSA to ensure that they are properly implemented.
- Support continued watershed restoration efforts, including measures to reduce temperatures in Ten Mile Creek.
- Encourage the City of Willits to become involved in planning for coho salmon recovery and to: assess, prioritize, and treat barriers to passage; address water quality issues; modify facility maintenance practices as necessary; and evaluate land use planning and revise plans as appropriate.

Terrestrial and Wetland [115]

- Pursue opportunities for cooperative wetland enhancement projects with private landowners on agricultural lands.

- Implement DFG plans for acquisition and management of high value wetlands in the Eel River Wildlife Area.
- Restore tidal action to diked wetlands, where feasible and appropriate, to enhance wetland and wildlife values as well as estuarine volume.
- Work with the Humboldt County Resource Conservation District to restore and enhance wetland functions, including habitat values and tidal flushing, in the Salt River watershed.
- Restore and enhance wetland and wildlife values, especially floodplain riparian forest, riverine pools, and the estuary, in public trust lands in the Eel River delta.
- Where feasible and appropriate, work with public agencies and individual landowners to address excessive erosion upstream in the watershed, in order to reduce impacts on delta wetland and wildlife values.
- Maintain existing agricultural land uses in Round Valley and Eden Valley through zoning.
- Work with Round Valley Indian Reservation and private landowners to pursue opportunities for cooperative wetland enhancement projects.
- Maintain existing Eden Valley agricultural land uses through zoning.
- Work with Eden Valley landowners to pursue opportunities for cooperative wetland and riparian enhancement projects.
- Explore use of riparian conservation easements at Eden Valley.
- Seek the acquisition of approximately 400 hectares (1,000 acres) at Little Lake Valley near Willits from willing landowners within the flooded area.
- Work with fisheries agencies to reduce the damaging effects that stream channelization could have on wetlands at Little Lake Valley.
- Work with resource conservation districts (RCDs) and the Natural Resources Conservation Service (NRCS) to plant riparian vegetation along stream channels around Little Lake Valley.
- Work with local conservation groups to reduce non-native vegetation at Little Lake Valley.

Coastal Trail, Public Access and Recreation[116]

- Work with private landowners to acquire public access rights at several locations from Centerville Beach to Cape Mendocino.
- Encourage Caltrans to design improvements for pedestrians and bicycles on the bridges crossing the Eel River.

Data Gaps

Data gaps for the Eel River HU include:

- Complete identification of barriers to fish passage and prioritization for removal.
- Identification of coho salmon rearing impacts from Van Arsdale outplanting site.[117]
- Assessment and prioritization of Caltrans culverts that are barriers to fish passage along Avenue of the Giants and Highway 101. Identification of barriers to fish passage and prioritization for removal.
- Technical assessment of Outlet Creek watershed, with recommendations to restore long-term function including prioritized implementation plans.
- Identification and prioritization of oak woodland habitat.

Local Planning Information *(see Catalogue, Appendix 1)*

Salt River Enhancement Plan—Humboldt County Resource Conservation District

Cape Mendocino Hydrologic Unit

Mattole River Estuary, "Lost Coast" *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Setting

The Cape Mendocino HU hugs the remote western corner of the North Coast region. At a juncture of continental and oceanic plates, tectonic forces have uplifted the steep King Ranges to over 4,000 feet above sea-level, while accelerated erosive forces have excavated 62 miles of free-flowing river. Unique and diverse, the Cape Mendocino HU comprises three watersheds totaling 319,663 acres (499 mi2): Mattole River, Bear River, and Oil Creek.

The Cape Mendocino HU is 78 percent private, and while only about 16 percent of the landscape is under industrial timber management, a full 40 percent is designated TPZ, reflecting the large suite of smaller private ownerships in the area.[118] Primary land use activities in the Mattole River include timber production, ranching, crop farming, and residential subdivision.[119] Nearly all of the 70,000 acres of public ownership in the HU are by BLM, mostly as part of the King Range National Conservation Area (KRNCA). KRNCA is home to the famed "Lost Coast," a 35-mile-long stretch of the most pristine and undeveloped coastline in California. The southern extent of the area includes portions of Sinkyone Wilderness State Park.

There are no major transportation routes in the Cape Mendocino HU: the small towns of Capetown, Petrolia and Honeydew are connected only by the Mattole Road from the north and Panther Gap Road that comes up through Humboldt Redwoods State Park to the east. Within the KRNCA lies the Shelter Cove subdivision, connected to the outside world by King's Peak Road to the north and Shelter Cove Road to the east.

Resources

- The Cape Mendocino HU, unlike most North Coastal watersheds, is not covered primarily by redwood forest; the shadowing effects of the King Range prevent cool summer fog intrusion, making the region too hot and dry in the summer. Rather, the watersheds are dominated by a mixture of Douglas fir forest (46 percent) and annual grassland (21 percent), with a significant complement of montane hardwood series.
- Special communities include: coastal and valley freshwater marsh, coastal Douglas fir–western hemlock forest, northern coastal scrub and northern coastal bluff scrub, northern maritime chaparral, northern maritime cypress forest, bald hills prairie, coastal terrace prairie, and Sitka spruce forest.[120]
- The variety of important wildlife species include: Chinook salmon (Mattole), coho salmon (Mattole and Big Creek), steelhead (Mattole), southern torrent salamander, foothill yellow-legged frog, tailed frog, western snowy plover,[121] and northern spotted owl.[122] The Mattole supports a wide diversity of herpetofauna, totaling 27 species—eight species of salamanders, three of frogs, five of lizards, nine of snakes, one turtle species, and one toad species.[123] Herds of elk are also present in the southern portions of the King Range.
- Rare plants include: coastal marsh milk-vetch, Oregon coast Indian paintbrush, beach layia, Howell's montia, Wolf's evening-primrose, maple-leaved checkerbloom, and Siskiyou checkerbloom.[124]
- The 3,000–4,000 foot peaks in the King Range wring water from Pacific storms, making this California's wettest spot, with annual rainfall exceeding 120 inches.[125]
- Ancient redwood and Douglas fir groves in federal, state and land trust ownership include Mill Creek, Gilham Butte, Honeydew Creek, and the Upper Mattole River and Forest Cooperative. Other areas of ancient redwood and Douglas fir forest remain in private ownership. Species such as sugar and knobcone pine and incense cedar, commonly found further inland, are also located here.
- The area is the most seismically active in California, especially the lower watershed near Petrolia. Three of the earth's great tectonic plates grind together at the Mendocino Triple Junction, just offshore from Cape Mendocino. Earthquakes exert major impacts on the landscape, causing massive landslides and rapid uplifting.
- Coastal lagoons form seasonally at the Mattole and Bear River estuaries. BLM owns the Mattole River estuary, while the Bear River estuary is in private ownership.
- Forest resources in the Mattole River watershed are located largely in medium-sized land holdings in a variety of industrial and non-industrial owners. Major owners include Pacific Lumber Company, Barnum Timber, and Eel River Sawmills.

Threats

- Problems for coho salmon recovery in the Cape Mendocino HU are: high summer water temperatures; water diversions and/or pumping; high levels of fine sediment; lack of deep pools, cover, other elements of habitat complexity; and suitable spawning gravels. Particular problems in the Mattole River include: high instream sediment levels; stream channel aggradation and widening; low flow conditions (a recent study by Sanctuary Forest highlighted the critical role of water withdrawal for residential use); and loss of functioning estuarine habitat.[126]
- Human activities such as road construction, grazing of livestock, and timber management have interacted with natural geologic instability and sediment production, as well as major storm events (e.g., the 1964 flood), to impact aquatic habitats. Disturbances from an increasing human population include: water diversions; conversion of near-stream areas to residential usage; removal of large, mature vegetation; widespread soil disturbance; construction of levees or armored banks' and the installation of dams and reservoirs that disrupt normal flow regimes and prevent free movement of salmonids and other fish.
- In some instances, subdivision of large ranches and industrial forestlands for home development has impacted the area through increased road density and heavier use of poorly designed roads. Subdivision of large landholdings is expected to continue into the foreseeable future, as land values are increasing in the Mattole Valley.[127]
- Timber harvest on unstable slopes may impact the watersheds. Harvests are currently occurring among the area's last remaining privately held old-growth Douglas fir groves, located in the Upper and Lower north fork's of the Mattole.[128]
- The August 2004 version of the Calfish Passage Assessment Database lists 68 potential barriers to fish passage within the Cape Mendocino HU. The Mattole River is listed as impaired on the federal 303(d) list of the Clean Water Act due to sedimentation and temperature.

Priority Conservation Sites From Selected Plans

Priority area overlaps within the Cape Mendocino HU occur in the Mattole River watershed, nearly all of which has been selected for inclusion in TNC's portfolio areas. The Mattole was also identified as the fourth highest priority basin for salmonid conservation in TNC's Aquatic Recommendations; it is considered of primary importance for the Southern Oregon-Northern California Coast (SONCC) Ecologically Significant Unit of Coho Salmon and for California Coast Chinook, and of secondary importance for northern California steelhead.

In particular, an area of significant coincidence of priorities occurs in the southwestern corner of the HU, near the upper headwaters of the Mattole, where focus has been placed on protecting consistently high-quality forest in BLM and Sinkyone Wilderness State Park holdings. Nearby coastal access and recreation priorities include improving non-motorized travel through the community of Shelter Cove.

General Action Recommendations

- Prioritize and upgrade all county culverts identified as passage barriers.
- Conduct an inventory, and prioritize for treatment, coho salmon migration barriers other than county culverts.
- Ensure protection of the high-quality habitat found in the Mattole River headwaters and historic coho salmon streams.

Site-specific Action Recommendations

Aquatic[129]

- Protect high-quality habitat found in the South Fork of Vanauken, Mill, Stanley, Thompson, Yew, and Lost Man creeks through recognition of current land management practices, and encourage private landowners to continue land stewardship.
- Request that the SWRCB begin the process of declaring the southern section of the Mattole River to be fully appropriated in the spring and summer.
- Cooperate in establishing monitoring stations at appropriate locations in the western sub-basin of the Mattole (Squaw, Honeydew, and Bear creeks), to monitor in-channel sediment and track aggraded reaches in the lower basin and in the lower reaches of major tributaries.
- Encourage tree planting and other vegetation management to improve canopy cover, especially in Conklin, Oil, Green Ridge, Devils, and Rattlesnake creeks in the northern sub-basin, and Dry and Blue Slide creeks in the eastern sub-basin.
- Encourage cooperative efforts for treatment of stream bank erosion sites to reduce sediment yield to streams, especially in Sulphur, Conklin, and Oil creeks and the lower reaches of the North Fork Mattole River.
- Encourage cooperation at stream bank erosion sites to reduce sediment yield to streams, especially in Middle, Westlund, Gilham, North Fork Fourmile, Sholes, Harrow, Little Grindstone, Grindstone, Eubank, and McKee creeks.

Terrestrial and Wetland [130]

- No major wetland areas have been delineated as priority conservation sites in the priority plans examined here.

Coastal Trail, Public Access and Recreation[131]

- Improve non-motorized travel through Shelter Cover.
- Work with private landowners to acquire public access rights from willing sellers at several locations from Centerville Beach to Cape Mendocino.

- Encourage Caltrans to design improvements for pedestrians and bicycles on the bridges crossing the Mattole River.

Data Gaps

Data gaps for the Cape Mendocino HU include:

- Complete assessment of barriers to passage for anadromous fishes.
- Monitoring of summer water and air temperatures using DFG-accepted protocols. Temperature-monitoring efforts in Stansberry, Mill, Clear, Squaw, Woods, Honeydew Bear, North Fork Bear, South Fork Bear, Little Finley, Big Finley, and Nooning creeks should continue, with expansion of efforts into other sub-basin tributaries.
- Road and erosion assessments in the eastern watershed, especially in Middle, Westlund, Gilham, Sholes, Blue Slide, and Fire creeks.
- Monitoring at appropriate locations in the western sub-basin of the Mattole (Squaw, Honeydew, and Bear creeks) of in-channel sediment and track aggraded reaches in the lower basin and in the lower reaches of major tributaries.
- Identification and prioritization of oak woodland habitat.

Local Planning Information *(see Catalogue, Appendix 1)*

- *Corridors Redwoods to the Sea Planning*—Save-the-Redwoods League
- *Dynamics of Recovery: A Plan to Enhance the Mattole Estuary*—Mattole Restoration Council
- *Five-year Plan for Salmon Stock Rescue Operations; 2001-2002 through 2004-2005 Seasons*—Mattole Salmon Group
- *King Range National Conservation Area Management Plan*—Bureau of Land Management
- *Lower Mattole Fire Plan*—Lower Mattole Fire-Safe Council
- *Mattole Implementation Plan*—Upper Mattole River and Forest Cooperative
- *Mattole North Coast Watershed Assessment Program (NCWAP)*—California Resources Agency, California EPA
- *Mattole River Total Maximum Daily Load (TMDL)*—North Coast Regional Water Quality Control Board, U.S. EPA
- *Mattole Watershed Plan*—Mattole River and Range Restoration Partnership, Mattole Restoration Council

Mendocino Coast Hydrologic Unit

Lower Ten Mile River and Estuary *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

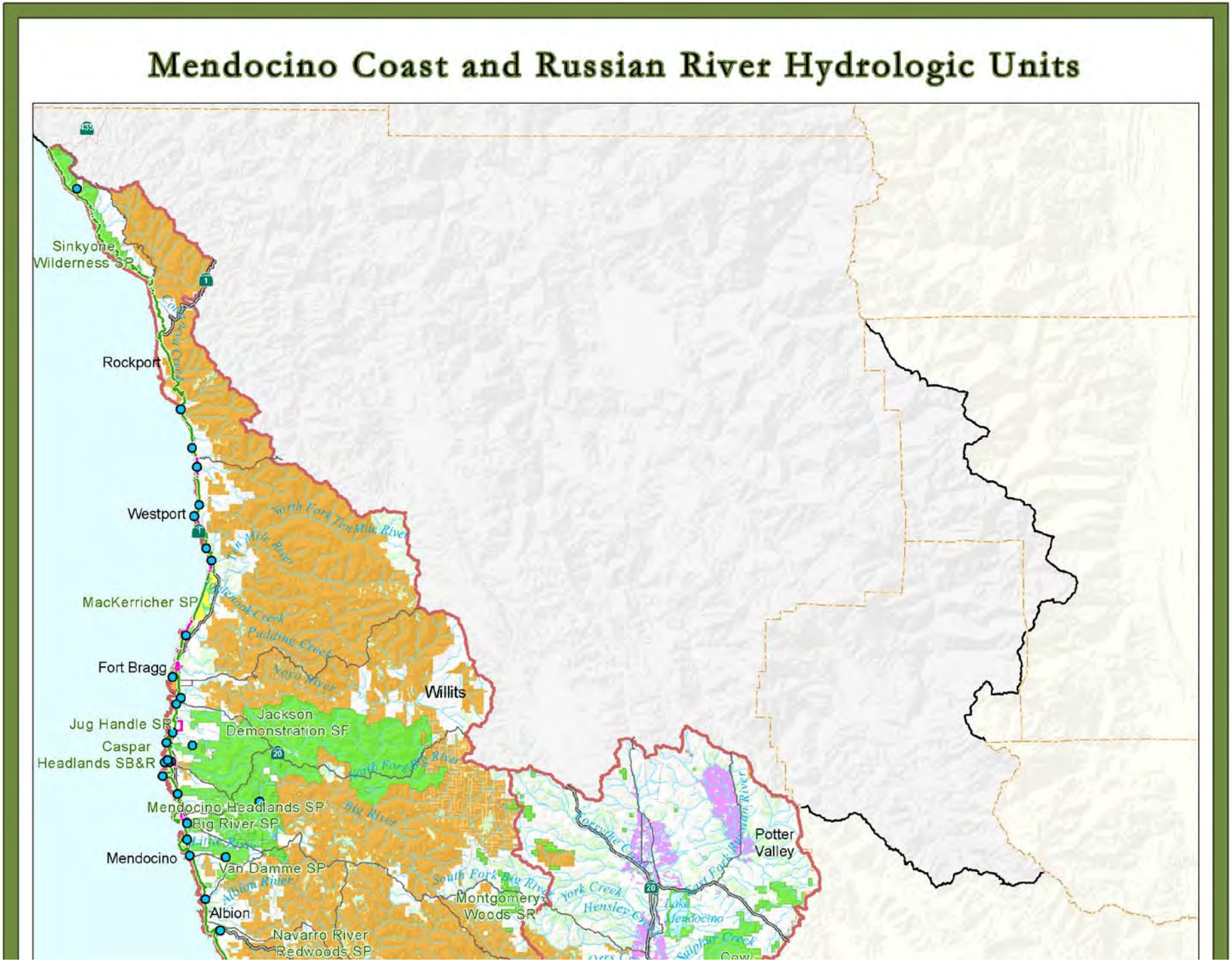
Setting

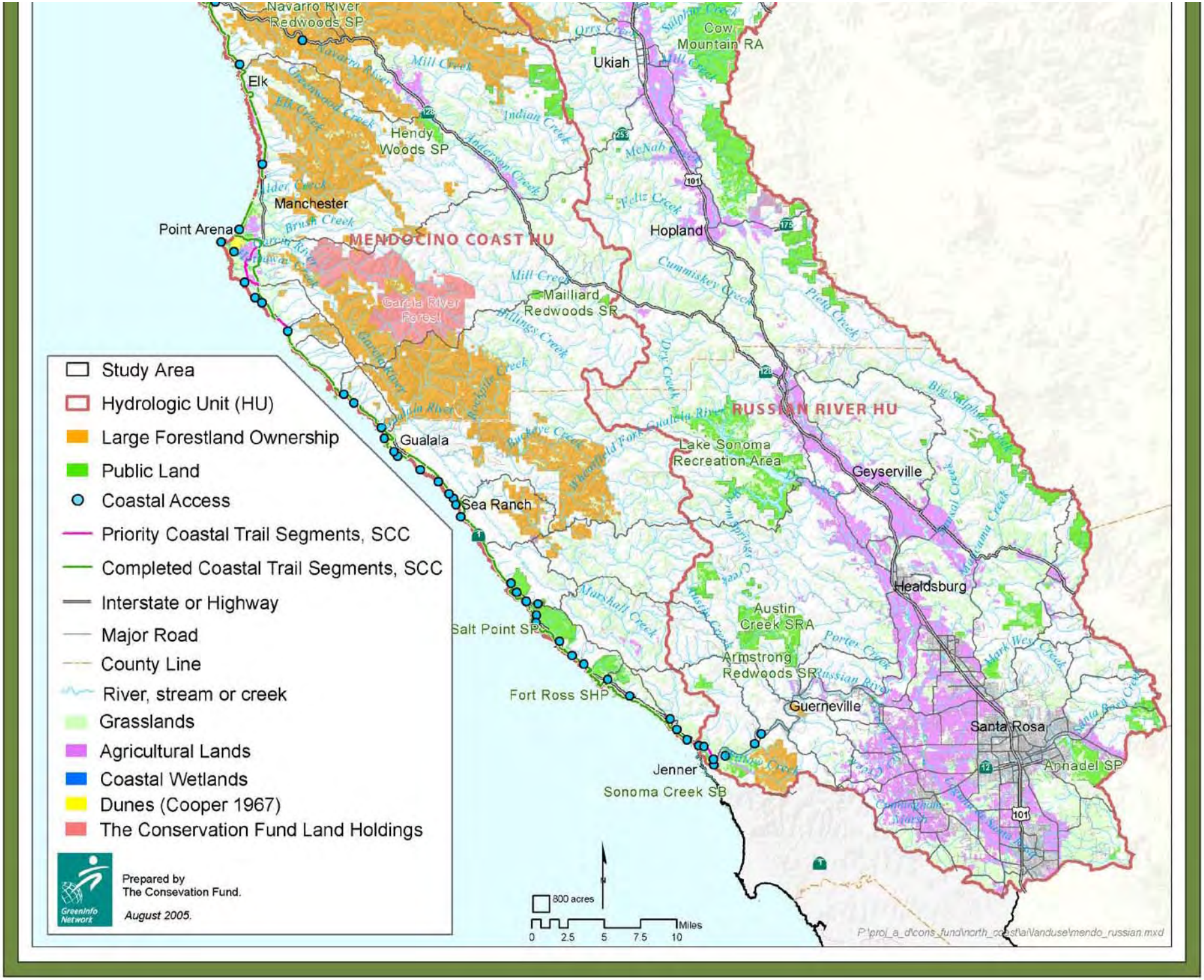
The Mendocino Coast HU stretches along the length of the Mendocino and Sonoma coast to the town of Jenner, encompassing fog-drenched slopes that range from the main inland ridges of the Coast Range towards coastal terraces and magnificent seaside bluffs. Covering some 1,023,175 acres (1,599 mi^2), the HU includes seven major river basins—the Ten Mile, Noyo, Big, Albion, Navarro, Garcia, and Gualala rivers—with numerous smaller streams also draining directly to the Pacific Ocean.

While including a great many more distinct watersheds than any of the other North Coast HUs, the Mendocino Coast HU is among the most unified in bio-geographical terms. The HU encompasses the majority of the redwood forest belt in Mendocino and Sonoma counties. The largest basin in the HU is the Gualala River, with an area of 222,399 acres (347 mi^2). The South Fork of the Gualala follows the San Andreas rift valley northward for about 25 miles, paralleling the coast. The Gualala enters the ocean at the Mendocino-Sonoma border after pushing through the steep, forested barrier ridge.

Of the remaining basins on the Mendocino coast, Navarro, Big and Noyo rivers are the largest (at 316 mi^2, 201 mi^2, and 166 mi^2, respectively) and most diverse, with land uses including timber production near the coast, irrigated agriculture along marine terraces and broader valleys, and grazing among a mosaic of grasslands and prairie. Melange geology in the eastern areas makes them less stable than coastal areas dominated by coastal belt geology.

Figure 6: Mendocino Coast and Russian River Hydrologic Units Map




Navarro River Redwoods SP
Elk
Manchester
Point Arena
Hendy Woods SP
Ukiah
Cow Mountain RA
Hopland
MENDOCINO COAST HU
Mailliard Redwoods SR
Garcia River Forest
Gualala
Sea Ranch
Salt Point SP
Fort Ross SHP
Jenner
Sonoma Creek SB
RUSSIAN RIVER HU
Lake Sonoma Recreation Area
Geyserville
Healdsburg
Austin Creek SRA
Armstrong Redwoods SR
Guerneville
Santa Rosa
Annadel SP
Study Area
Hydrologic Unit (HU)
Large Forestland Ownership
Public Land
Coastal Access
Priority Coastal Trail Segments, SCC
Completed Coastal Trail Segments, SCC
Interstate or Highway
Major Road
County Line
River, stream or creek
Grasslands
Agricultural Lands
Coastal Wetlands
Dunes (Cooper 1967)
The Conservation Fund Land Holdings
Prepared by
The Consevation Fund.
August 2005.
GreenInfo Network
800 acres
0 2.5 5 7.5 10
Miles

Land use in the Mendocino Coast HU is dominated by private timber production, with over 91 percent in private hands and a majority (50.4 percent) in industrial timberland ownerships, with the largest owners being Hawthorne Timber Company and Mendocino Redwood Company. The largest public ownership is also timberland, managed by the California Department of Forestry at the 48,000-acre Jackson Demonstration State Forest. Other public holdings primarily include state parks located along and protecting the coast (Sinkyone Wilderness State Park, MacKerricher State Park, Jug Handle State Reserve, Caspar Headlands State Beach, Van Damme State Park, Manchester State Beach, Salt Point State Park, and Fort Ross State Historic Park) as well as inland redwood holdings (Navarro River Redwoods State Park, Montgomery Woods State Reserve, and Mailliard Redwoods State Reserve).

The HU's main coastal transportation route is Highway 1, with major accesses to Highway 101 by Highway 20 from Fort Bragg and Highway 128 from Albion. Fort Bragg (pop. 7,100) is the Mendocino Coast HU's largest town; smaller coastal towns include Mendociono, Albion, Point Arena and Gualala. A 2,300-lot seaside development along the Gualala River coast, Sea Ranch, is a major residential subdivision in coastal region of the HU.

Resources

- The Mendocino Coast HU is covered primarily by redwood-dominant forest (53 percent), with nearly another third in montane hardwood and annual grassland complexes. Only seven percent of the HU is forested by Douglas fir.
- The Mendocino Coast HU exhibits a full diversity of coastal ecotypes, including: coastal and valley freshwater marsh, coastal brackish marsh, coastal terrace prairie, fen, grand fir forest, Mendocino pygmy cypress forest, northern coastal bluff scrub, northern coastal salt marsh, pygmy forest, and sphagnum bog.[132] The area also includes the southernmost stand of Sitka spruce.
- The Mendocino coast supports a large amount of biological diversity for a relatively small area. Resources include 44 listed plant species, 26 listed animal species, and ten special plant communities.[133]
- Wildlife species of concern include: Behren's silverspot butterfly, lotis blue butterfly, tidewater goby, California red-legged frog, western snowy plover, peregrine falcon, and Point Arena mountain beaver.[134]
- Rare plants include: pygmy manzanita, Humboldt milk-vetch, Howell's spineflower, Sonoma spineflower, round-headed Chinese houses, supple daisy, Contra Costa goldfields, rose leptosiphon, coastal triquetrella, Roderick's fritillary, Pomo bronze shoulderband, pink salmon, Menzies's Wallflower, and North Coast semaphore grass.[135]
- Anadromous fish, once abundant in this area, have declined for many years, due in large part to habitat destruction (siltation and removal of vegetation), resulting in the federally threatened listing status of coho salmon, steelhead, and Chinook. The most important anadromous fish streams, in terms of miles of use, are the Ten Mile, Noyo, Big, Navarro, Garcia and Gualala rivers.[136]

- Large mammals include black-tailed deer, black bear, mountain lion, coyote, bobcat, gray fox, and ringtail. Roosevelt elk were once found throughout the coastal area, but are now found only in the extreme northern portion of the coast (King Range National Conservation Area).[137]

- Pygmy forest vegetation covers about 1,050 acres in the coastal zone, including areas in public ownership at Jug Handle State Reserve and Van Damme State Park. Pygmy forest, a relatively rare dwarf conifer community, results from a combination of impoverished, acidic soils with very poor drainage caused by an underlying hardpan. In pygmy forests, Mendocino cypress, Bolander pine, bishop pine, and even redwood may grow only three to ten feet in 100 years. Several rare species are associated with pygmy forests, including Mendocino manzanita, Mendocino cypress, coast lily and Bolander pine.

- One of the region's most remarkable dune systems stretches south from the mouth of the Ten Mile River toward the town of Fort Bragg. The nearly 1,600 acres of dune habitats that lie within MacKerricher State Park are characterized by largely intact communities of dune mat stretching inland to the southernmost coastal fen in California, Inglenook Fen. The Manchester Dunes also comprise one of the region's largest dune systems, extending over four miles from the mouth of the Garcia River in Point Arena north to the mouth of Alder Creek. These have been largely altered through colonization by imported European beachgrass.[138] Finally, two small stretches of dune exist to the south of the Gualala River mouth.

- Two of the largest wetland areas along the coast are found at the Manchester Plain near Point Arena and at Big River. The Manchester Plain wetlands consist of six wetlands that collectively are very important to migratory birds on the Pacific Coast: Alder Creek, Manchester Lagoons, Brush Creek, Hunter's Lagoon, and Hathaway Creek marsh. Big River empties into the Pacific just south of the Mendocino Headlands, 16 kilometers (ten miles) south of Fort Bragg. Big River estuary, nominated by the U.S. Fish and Wildlife Service for Significant California Ecosystem designation, covers 610 hectares (1,500 acres) and is one of the largest relatively undisturbed estuaries along the California coast. Starry flounder and Dungeness crab inhabit the river estuary; coho salmon and steelhead spawn upstream. Migratory waterfowl overwinter in the river's inland watershed.[139]

- Other regionally important marsh and wetland habitats are found at the estuaries of: Cottoneva Creek, the Ten Mile River (with 75 acres of salt marsh), Inglenook Fen, Pudding Creek (22-acre coastal wetland), Albion River, Navarro River, Elk Creek, Garcia River (64 acres of salt and freshwater marsh, 30 acres of wetland), and the Gualala River.[140]

- Offshore rocks and onshore rocky areas are important locations for seabird and marine mammal rookeries. Five in particular have been designated as major seabird rookeries because they provide habitat for rare species or have at least 100 nests: Cape Vizcaino, Goat Island, Devil's Basin Rocks, White Rock, and Fish Rock.[141]

- Federally threatened bird species include: marbled murrelet (also state listed as endangered) at three known locations (Ten Mile, Russian Gulch, and Alder Creek watersheds, plus radar detections at Albion River); northern spotted owl throughout conifer areas including second- and

third-growth areas (note: one of the highest densities in the state occurs on Hawthorne Timber Company's westernmost 11,000 acres in the Big River watershed); and western snowy plover.

- Approximately nine percent (8,617 acres) of Mendocino County's coastal zone is prime agricultural land, and approximately 30 percent (2,548 acres) of these lands are under active agricultural management. Prime and active agricultural lands are concentrated between Elk and Point Arena, particularly in the Manchester farming area, known as a "banana belt" with growing conditions comparable to the Salinas Valley.[142]
- Forest resources along the Mendocino coast extend the length of the Coast Ranges, and large industrial ownerships cover over 500,000 acres, half of the HU and virtually the entire redwood belt. Major timber owners include Hawthorne Timber Company, Mendocino Redwoods Company, and to the south, Gualala Redwoods and Coastal Forestlands. The Conservation Fund currently owns and manages 24,000 acres of timberland along the Garcia River, comprising the North Coast region's only working forest owned and managed by a conservation non-profit.

Threats[143]

- Loss and fragmentation of sensitive terrestrial habitats and species diversity has occurred due to: timber harvest methods that do not allow for healthy ecological function of coastal forests; conversion of agricultural and forestland to residential and other uses; non-sustainable agricultural practices; overuse and/or inappropriate use of public recreational areas; spread of exotic species; and spread of fungal diseases such as Sudden Oak Death.
- Sensitive aquatic habitats, especially those that support anadromous fish species, have declined due to sedimentation and increased temperature of streams. Sediment sources include poorly designed and/or maintained timber and rural residential roads and stream crossings, lack of road maintenance, timber harvests that do not maintain a proper stream setback, and insufficient stream setback for timber harvests and agricultural activities. Associated threats include loss of deep pools necessary for juvenile fish survival due to increased flows; sedimentation and removal of LWD in or near streams; and rise in water temperature due to removal of riparian cover by timber and agricultural activities.
- Coastal saltwater habitats are threatened by chemical contamination from septic systems, pesticides and herbicides, and sedimentation, as well as the potential for offshore oil drilling.
- Threats to forestry in the HU include: loss, conversion and fragmentation of working forestlands due to declining forestry economics, regulatory disincentives, and estate tax issues; decline of forest inventories due to aggressive timber harvest rates, mostly on industrial timber lands; loss of forests due to vineyard conversions; decline of working forests and species diversity due to disease; and global competition (particularly anticipated in the fir market).
- Inappropriate residential development has resulted in fragmentation of sensitive habitats, deteriorated cultural and historic sites and scenic resources, and the loss of opportunities to provide public coastal access and California Coastal Trail connections.

- Loss and fragmentation of agricultural lands has occurred due to decline of agricultural economics, regulatory disincentives, residential development, lot-line adjustments, and growth of the second-home market.
- The reduction and/or degradation of sensitive coastal habitats and species continue due to highly concentrated and/or improperly managed public coastal access.
- Though water quality characteristics in the HU are generally adequate for salmonids, there are several problems facing salmonid survival. Several major stream systems in the Mendocino Coast region are on the federal 303(d) Clean Water Act list for sedimentation or temperature. High summer water temperatures are the most identifiable problem limiting distribution of coho salmon in some streams. None of the major streams has mainstem dams blocking large portions of salmonid habitat; however, manmade barriers to migration do exist, caused mainly by culverts designed and placed with insufficient consideration of fish passage. The lack of instream shelter (especially LWD), as well as water diversions and illegal harvest, may also limit production of coho salmon within the HU.[144]
- The August 2004 version of the Calfish Passage Assessment Database lists 3,976 potential barriers to fish passage within the Mendocino Coast HU.
- The Albion, Navarro, and Noyo rivers are listed as impaired on the federal 303(d) list of the Clean Water Act due to sedimentation, and the Garcia is listed due to temperature. The Big and Ten Mile rivers are listed for both sediment and temperature.

Priority Conservation Sites From Selected Plans

The Mendocino Coast HU is consistently one of the most highly valued regions of the North Coast by the plans synthesized here; it is one of the best-understood and planned areas as well. Nearly the entire region exhibits a concurrence of three or more priorities from various selected plans. In addition, a number of coastal watersheds emerge as clearly agreed-upon priorities for conservation action.

Perhaps foremost of these is the Ten Mile River watershed, which receives a high priority in TNC's Ecoregional Plan and Aquatic Recommendations, DFG's Recovery Strategy, the PCJV Strategic Plan, Save-the-Redwoods League's Focal Areas, and MLT's Coastal Plan. It also includes several priority California Coastal Trail improvement sites along the Highway 1 corridor.

Secondly, the Navarro and Garcia River watersheds are also highly valued in the aquatics analyses: both are valued as top priorities for coho salmon and steelhead in TNC's Aquatic Recommendations, and both are valued highly for coho salmon management and restoration potential by DFG. In addition, each of these areas exhibits high overlap with TNC terrestrial priorities and Save–the-Redwoods League's Focal Areas, especially in the far lower and upper reaches of the Garcia and in the lower stretches and North Fork of the Navarro.

A third area includes a series of overlapping plan priorities that stretch east along a section of lands encompassing the Caspar headlands, the estuary of the Big River, the Albion River, and the south fork of the Big River. The Albion is a top priority in the DFG Recovery Strategy as well as in

MLT's Coastal Plan. Numerous TNC portfolio areas and Save-the-Redwoods League's Focal Areas analyses units overlap in this region as well.

Finally, several auxiliary analyses point to the North Fork of the Gualala River and areas of the northern Sonoma Coast for their heightened and imperiled resource values. These include MLT's Coastal Plan, TNC's Ecoregional Plan, Save-the-Redwoods League's Focal Areas, the Coastal Conservancy's Coastal Trail, and Sonoma Land Trust's Sonoma County Coastal Parcel Study.

General Action Recommendations

- Utilize as a model for erosion reduction and LWD placement the comprehensive approach practiced in the South Fork of the Garcia River.[145]

Site-specific Action Recommendations

Aquatic[146]

- Develop erosion control plans similar to the North Fork Ten Mile River erosion control plan.
- Target Big River for enhancement of instream habitat by installation of LWD.
- Reestablish connectivity of North Fork Garcia River to the mainstem.
- Provide technical assistance and incentives to Garcia River landowners for developing and implementing sediment reduction plans to meet the requirements of the Clean Water Act TMDL.
- Maintain the following tributaries to provide cold water input to the Garcia River mainstem: Hathaway Creek, North Fork, Rolling Brook, Mill Creek, South Fork, Signal Creek.
- Work with landowners to plant riparian zones of Blue Waterhole, Inman, and Pardaloe creeks to reduce instream temperatures and inputs into the Garcia River mainstem, and to provide a long-term source of conifer LWD.
- Excavate a geomorphically designed channel in the lower North Fork Garcia River, which currently goes subsurface in the summer months, stranding thousands of salmonids. Juvenile coho salmon should be rescued until the restoration project is undertaken and completed.
- Work with landowners to plant conifers in the lower mainstem Garcia River from Eureka Hill Road Bridge to Windy Hollow Road, with the goal of reducing stream temperature and providing bank stability and long-term LWD.
- Consider projects to open logjam migration barriers while maintaining LWD in the North Fork Garcia, South Fork Garcia, and Fleming Creek.
- Complete the remaining 25 percent of erosion control sites identified in the South Fork Garcia River by the Trout Unlimited North Coast Coho Project.
- Study the Garcia River estuary using the Garcia River Estuary Enhancement Feasibility Study, as well as new information, to consider restoring estuarine functions that would benefit coho salmon.

- Complete comprehensive assessment/implementation of erosion control measures in the entire North Fork Gualala basin.
- Place LWD in Inman Creek, South Fork Garcia River, Signal Creek, and North Fork Garcia River, where necessary and with willing landowners.
- Plant redwood trees in the lower seven miles of the Garcia River mainstem between Eureka Hill Road and Windy Hollow Road for long-term LWD and bank stability and reduction of instream temperatures (which are now close to being suitable for coho salmon).
- Comprehensive, sub-basin wide erosion control and LWD installation are being implemented by Mendocino Redwood Company in partnership with the DFG, through the North Coast Coho Project, in the Little North Fork of the Navarro. This approach of "storm proofing" key sub-basins needs to be fully implemented in the sub-basins of: Flynn, Dutch Henry, John Smith, Minnie, Horse Camp, and German creeks. These tributaries have been identified as high priority in the Navarro River Restoration Plan.
- Investigate the role of the Pudding Creek Dam impoundment along the Noyo River in coho salmon migration and freshwater survival rate; repair dam as appropriate.
- Support funding to address barriers to passage on the California Western Railway right-of-way.
- Evaluate the biological justification for the egg-taking station on the South Fork Noyo River.
- Complete implementation of erosion control sites—identified in North Coast Coho Project—on North Fork Ten Mile. Encourage development of similar projects in other coho salmon sub-basins.
- Enforce the existing SWRCB/DFG bypass flow permit conditions of the North Gualala Water Company diversion on North Fork Gualala River. The North Fork Gualala River provides an important source of cold water input to the lower mainstem and estuary (Higgins, Keegan Estuary Study).
- Investigate expanding the North Fork Gualala River riparian zone where necessary, through acquisition/easement from willing participants.
- Investigate acquisition/easement from willing sellers with old-growth redwoods on Haupt Creek on the Gualala River.
- Prepare watershed assessments, acquire working forest easements, and implement restoration projects for the Ten Mile and Big River watersheds.[147]
- Remove Fish Barriers at Schooner Gulch, the north and south forks of Caspar Creek, and Bridge Creek along the North Fork of the Navarro River.[148]

Terrestrial and Wetland [149]

- Cooperate with the Campbell Group to investigate the potential for restoration of wetlands at Cottaneva Creek through the removal of existing fill areas.

- Work with private timberland managers to restore wetlands on corporation lands in the Ten Mile watershed.
- Support state park actions to provide protection to Ten Mile Beach for wintering and nesting western snowy plovers and rare plant populations.
- Support the work of local agencies and conservation groups to reduce non-native vegetation at Ten Mile River.
- Encourage state park management to continue efforts at Inglenook Fen to secure and enhance wetland and riparian habitats that are presently used as pasture.
- Support retention of current zoning to protect existing habitat values at Pudding Creek.
- Enhance wildlife values on Pudding Creek through cooperative efforts with the private landowner, Campbell Group.
- Work with volunteer groups to place wood duck nest boxes at suitable habitats within Pudding Creek.
- Support the MLT and DPR in developing a long-term monitoring and management plan for the Big River estuary and the adjacent forested lands.
- Provide information and support to Mendocino Redwood Company and other private landowners to provide improved management and enhancement of wildlife habitats in the Albion watershed.
- Work with private landowners and other groups to provide enhanced wood duck nesting habitat along the Navarro.
- Monitor the permitting and operation of commercial fishing mariculture to ensure the protection of eelgrass beds at the mouth of the Navarro.
- Support retention of current zoning to protect existing habitat values and to protect agricultural lands from more intensive development along the Point Arena plain and headland, Alder and Brush creeks, the Garcia River, and the Gualala River estuary.
- Work with agricultural landowners to create riparian easements along the Point Arena plain and headland, Alder and Brush creeks, the Garcia River, and the Gualala River estuary.
- Enhance wildlife habitat through cooperative efforts with private landowners and DPR along the Point Arena plain and headland, Alder and Brush creeks, the Garcia River, and the Gualala River estuary.
- Work with the California Department of Transportation to ensure that any project involving Highway 1 fully considers the impacts to the area's wildlife habitats along the Point Arena plain and headland, Alder and Brush creeks, the Garcia River, and the Gualala River estuary.
- Work with volunteer groups to place wood duck nest boxes at suitable habitats along the Point

Arena plain and headland, Alder and Brush creeks, the Garcia River, and the Gualala River estuary.

- Support a coordinated agricultural streamlined permit program in the Navarro watershed.[150]
- Acquire an easement to protect old-growth redwood and marbled murrelet nesting sites in Alder Creek.[151]
- Acquire fee and/or easements to protect the Elk Creek estuary.[152]

Coastal Trail, Public Access and Recreation[153] [154]

- Improve the California Coastal Trail through Sinkyone Wilderness State Park.
- Work with private landowners to acquire public access rights and improve a trail corridor connecting Usal Road and Westport-Union Landing State Park.
- Improve the California Coastal Trail west of Highway 1 between Westport and Bruehl Point.
- Construct vertical access ways between Chadbourne Gulch and Abalobadiah Creek.
- Improve the Highway 1 corridor for non-motorized travel between Bruehl Point And Ten Mile River.
- Encourage DPR to complete restoration of the Pudding Creek trestle to connect MacKerricher State Park with the city of Fort Bragg.
- Improve access to MacKerricher State Park from Highway 1.
- Design and construct a trail along Todd's Point.
- Complete a system of trail improvements separate from Highway 1 that will connect Russian Gulch State Park, Point Cabrillo Reserve, Caspar Headlands, Caspar State Beach, and Jug Handle State Reserve.
- Work with private landowners to acquire public access rights along the bluffs from Dark Gulch to Albion Cove and the Albion Headlands.
- Work with private landowners to design a public trail from Navarro River State Park to and along the Navarro beach headlands.
- Improve the Highway 1 corridor for non-motorized travel between the Navarro River and Manchester State Park.
- Work with private landowners to acquire public access rights and improve a trail corridor connecting Manchester State Beach and the Point Arena Pier.
- Improve the Highway 1 corridor for non-motorized travel from Schooner Gulch State Beach to the Gualala River.
- Complete the Gualala Bluff Trail.

- Work with the Sea Ranch Association to provide a continuous public bluff-top trail.
- Work with private landowners to acquire public access rights and improve a trail corridor connecting Salt Point State Park, Stillwater Cove Regional Park, and Fort Ross Historic State Park, consistent with the recommendations of Sonoma Land Trust's *Russian River/North Coast Parcel Analysis*.
- Encourage DPR to extend the existing trails within Salt Point State Park and Fort Ross State Historic Park to provide safe pedestrian access west of Highway 1.
- Work with private landowners to acquire additional public access rights west of Highway 1 and extending northward from Salt Point State Park, for the development of a bluff-top trail and recreational support facilities.
- Work with private landowners to design public trail from Fort Ross State Historic Park to Jenner.
- Acquire California Coastal Trail access easements along the Usal Creek/Rockport coastal terrace.[155]
- Acquire public Rockport Beach access, as well as biological and forest resource easements.[156]
- Acquire fee and/or easements to protect agricultural, biological and scenic resources identified in the Mendocino County Coast Conservation Plan in and around the Ten Mile estuary, as well as between Point Arena and Manchester.[157]
- Purchase easements to secure a looped public trail system around Fort Bragg.[158]
- Renovate Pudding Creek Trestle for trail use.[159]
- Purchase easements to secure a trail or wildlife corridors between parks and preserves in the Caspar Creek,[160] Little River, and Albion watersheds.[161]
- Secure better beach access at the Elk Creek estuary.[162]

Data Gaps

Data gaps for the Mendocino Coast HU include:

- Assessment of coastal wildlife corridors throughout Mendocino County.
- Restoration plans for estuary functions to benefit coho salmon in the Garcia River estuary.
- Assessment of the role of the Pudding Creek Dam impoundment along the Noyo River in coho salmon migration and freshwater survival rate.
- Prioritization of erosion control measures in North Fork Gualala basin.
- Evaluation of the potential to restore or create wetlands on private lands along the Point Arena plain and headland, Alder and Brush creeks, the Garcia River, and the Gualala River estuary.
- Identifcation and prioritization of oak woodland habitat.

Local Planning Information *(see Catalogue, Appendix 1)*

- *Sinkyone Wilderness State Park General Plan*—California Dept. of Parks and Recreation
- *Ten Mile River Total Maximum Daily Load (TMDL)*—North Coast Regional Water Quality Control Board, U.S. EPA
- *MacKerricher State Park–Coastal Dune and Sensitive Species Plan*—California Department of Parks and Recreation
- *Noyo River Total Maximum Daily Load (TMDL)*—North Coast Regional Water Quality Control Board, U.S. EPA
- *Big River Preliminary Plan: Resource Assessment and Recommendations*—Mendocino Land Trust
- *Watershed Guidelines for Big River Watershed, Mendocino, CA*—Big River Watershed Council
- *Navarro River Total Maximum Daily Load (TMDL)*—North Coast Regional Water Quality Control Board, U.S. EPA
- *Navarro Watershed Restoration Plan*—California State Coastal Conservancy, Mendocino County Water Agency and Anderson Valley Land Trust
- *Garcia Estuary Feasibility Study, Phase I (Moffatt & Nichol for MCRCD, 06/96)*—Mendocino County Resource Conservation District
- *Garcia River Bank Erosion Study* (Moffatt & Nichol, 03/95)—Mendocino County Resource Conservation District
- *Garcia River Total Maximum Daily Load (TMDL)*—North Coast Regional Water Quality Control Board, U.S. EPA
- *Garcia River Watershed Enhancement Plan*—Mendocino County Resource Conservation District
- *Gualala River North Coast Watershed Assessment Program (NCWAP)*—California Resources Agency, California EPA
- *Gualala River Total Maximum Daily Load (TMDL)*—North Coast Regional Water Quality Control Board, U.S. EPA
- *Gualala River Watershed Literature Search and Assimilation*—Redwood Coast Land Conservancy

Russian River Hydrologic Unit

Russian River Mouth at Jenner *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Setting

Ranging from cool redwood forests in the west to verdant vineyards and hardwood-dominated ranchland in the east, the Russian River HU covers an area of approximately 949,983 acres (1,484 mi^2). It includes about 240 named and numerous unnamed tributaries.[163] With a runoff of 1,600,000 acre-feet, the Russian is the North Coast's third largest river system, after the Klamath and the Eel.

Agriculture dominates land uses in the Russian River drainage. Over 86 percent of the watershed is in private ownership, with ranchland and vineyard acreages taking precedence over timberland (only 1.2 percent of the HU is in industrial timber ownership). Major public land holdings in the HU include nearly 43,000 acres conserved by the Sonoma County Agricultural and Open Space District, as well as sections of Cow Mountain Recreation Area, Lake Sonoma Recreation Area, Annadel State Park, Austin Creek State Recreation Area, and Armstrong Redwoods State Reserve.

The Russian River is also the most urbanized area on the North Coast, with major urban development centering along the Highway 101 corridor from Cotati north to Ukiah. Santa Rosa, with a population of 148,000, is the area's largest city and major retail, commercial and industrial center.

Resources

- The majority of the Russian River HU is covered by Montane Hardwood and Annual Grassland vegetation associations, with agricultural land cover types making up nearly 13 percent of the area. Douglas fir forest and redwood forest make up 7.5 percent and 3.5 percent of the HU, respectively. Specialized communities in the HU include: coastal brackish marsh, coast and valley freshwater marsh, northern vernal pool, northern interior cypress forest, blue oak woodland, Oregon oak woodland, mixed north slope cismontane woodland, northern and montane mixed chaparral, and serpentine chaparral.[164]

- Special status wildlife species include: California freshwater shrimp, Ricksecker's water scavenger beetle, Russian River tule perch, Central California Coast Steelhead ESU, California tiger salamander, California Red-legged frog, western yellow-billed cuckoo, tricolored blackbird, bank swallow, and grasshopper sparrow.

- Other important aquatic species inhabit the watershed, including: California freshwater shrimp, Chinook salmon, hardhead catfish, longfin smelt, river lamprey, Russian River tule perch, Pacific brook lamprey, Navarro roach, Russian River hitch, foothill yellow-legged frog, and northwestern pond turtle.[165]

- State, federal, and globally endangered plants include: Baker's meadowfoam, beaked tracyina, Bolander's horkelia, Burke's goldfields, California beaked-rush, Clara Hunt's milk-vetch, Crystal Springs lessingia, Geysers dichanthelium, Hickman's cinquefoil, Kenwood Marsh checkerbloom, Loch Lomond button-celery, many-flowered navarretia, narrow-leaved daisy, North Coast semaphore grass, Pennell's bird's-beak, Pitkin Marsh Indian paintbrush, Roderick's fritillary, Santa Cruz clover, Sebastopol meadowfoam, serpentine daisy, showy Indian cover, Sonoma alopecurus, Sonoma spineflower, Sonoma sunshine, Cedars fairy-lantern, Tidestrom's lupine, valley needlegrass grassland, Vine Hill clarkia, Vine Hill manzanita, white sedge, and yellow larkspur.[166]

- Coho salmon have historically occurred in six of the 11 Russian River Hydrologic Sub Areas (HSAs) (Guerneville, Austin Creek, Geyserville, Mark West, Warm Springs, and Santa Rosa Creek). Of the four salmonid species that historically occurred in the watershed (Chinook salmon, pink salmon, coho salmon, and steelhead trout), pink salmon have been virtually extinct since 1955, while the other three species are currently listed as threatened under the federal Endangered Species Act. Natural coho salmon production in the Russian River system was augmented through annual releases of about 70,000 yearlings produced at the Warm Springs Hatchery between 1980 and 1998. A captive coho salmon broodstock program was initiated by DFG, NOAA Fisheries, and the US Army Corps of Engineers at the hatchery in 2001. Using conservation hatchery principles, its goal is to restock selected streams within the Russian River basin with juvenile coho salmon derived from local natural spawning populations.

- Major inland wetland areas along the Russian River include Laguna de Santa Rosa, Green Valley Creek, sections of Potter Valley, Lake Mendocino, and the Russian River Valley to Hopland. The Laguna de Santa Rosa, including Cunningham Marsh, is a 7,000-acre wetland complex that has

been greatly reduced from its historic extent but still provides major waterfowl nesting and wetland species habitat. Austin Creek is a significant riparian community with scattered freshwater marsh that provides merganser, wood duck, and salmonid habitat. Willow Creek includes a series of wetlands along a narrow plain reaching back from the Russian River.[167]

- Forest land ownership tends to be small to medium-sized private landowners and ranch owners who supplement income through a range of harvest practices. Only the initial stretches of the lower watershed lie within the redwood belt; toward the east the mountains transition from oak woodlands into drier pine forests.

Threats

- Problems for coho salmon recovery in the Russian River basin include: gravel mining; poor gravel quality; inadequate gravel quantity; lack of riparian stability; loss of native plant species; invasion of non-native plants; inappropriate water temperature; water diversions and/or pumping; poor water quality; and an altered hydrologic regime. The river is listed as impaired for sediment on the federal 303(d) list of the Clean Water Act.[168]
- Fish migration is adversely affected by natural and manmade physical barriers such as bedrock constrictions and falls, debris jams, dams, road crossings, and culverts.[169] The August 2004 version of the Calfish Passage Assessment Database lists 1,099 potential barriers to fish passage on the Russian River.
- Conversion of oak woodlands to agricultural uses, primarily vineyard production, has been accelerating over the past decade, as has subdivision of larger agricultural parcels into residential uses along the 101 corridor and along the lower Russian River towards Guerneville.
- Urban development and resulting habitat fragmentation remains one of the greatest shifts in land use in the Russian River basin, particularly along the Highway 101 corridor. Land use planning practices that promote extensive suburban development continue in large measure, resulting in loss of agricultural lands and wetland and riparian habitats.
- Degradation of the wetland resources of the Laguna de Santa Rosa is ongoing, with impacts from urban development, invasive species, water extraction, and wastewater treatment. The Russian River historically contained vast amounts of riparian forest, marsh, and seasonal freshwater marshes on river terraces.

Priority Conservation Sites From Selected Plans

The Russian River HU exhibits a wider variety of habitats than much of the North Coast, but its population density and level of development results in fewer identified conservation priorities than other HUs. For example, of the large HUs on the North Coast, it has the lowest percentage of land in TNC portfolio areas (31 percent, compared to over 60 percent of the Eel and Mendocino Coast units).

However, several overlaps among plan priorities exist in the lower watershed. It is the only

watershed examined in TNC's Aquatic Recommendations regarding priority runs of Central California steelhead. A large area stretching from the river's mouth through the mountainous and forested region surrounding Guerneville, and including the broad wedge south of Healdsburg along Mark West Creek, is noted as higher priority for SONCC coho salmon restoration and management potential. The upper stretches of Mark West Creek have also been identified as a TNC portfolio area.

In addition, forest and woodland areas within the Austin Creek drainage to the north of Guerneville have been highlighted by TNC and Save-the-Redwoods League analyses. Portions of this area are already conserved within Austin Creek State Recreation Area and Armstrong Redwoods State Preserve; much of the remaining resources are in private ownerships with uses including timber production, gravel mining, and rural development. This area includes large examples of serpentine barrens and habitat for northern spotted owl.

General Action Recommendations

- Implement the Coho Salmon Captive Broodstock Program: continue genetic analysis of source stocks for coho salmon broodstock; stock first-priority barren streams, and identify additional streams that may be suitable for stocking as restoration occurs; develop and implement a monitoring and evaluation program to adaptively manage the Program; develop, implement, and evaluate experimental release protocols for the Program; review and revise long-term hatchery Program goals based on results of the monitoring and evaluation program; and develop and implement a long-term monitoring program for coho salmon abundance trends in suitable index streams that have recent (within eight years) coho salmon presence or that will be supplemented with the Program.
- Manage summer flows in the mainstem of the Russian River to the benefit of rearing coho salmon and of the estuary, while ensuring that all existing legal water uses and rights are accounted for.
- Work to encourage private landowners to enhance seasonal and permanent wetlands, and promote the restoration of riparian zones.
- Identify water diverters, and request that SWRCB review or modify water use based on the needs of coho salmon and authorized diverters. Monitor and identify problems, and prioritize needs in terms of changes to water diversion, in particular Green Valley and Dutchbill creeks, which have been identified as current or potential coho streams s that often go dry.

Site-specific Action Recommendations

Aquatic[170]

- Implement the Sotoyome Resource Conservation District's Fish Friendly Farming Program within Sonoma and Mendocino counties.
- Explore adjusting the operation of Mirabel Dam within confines of existing water rights and legal

uses, to improve passage of downstream migrants.

- Update temperature analyses below Coyote Dam and Warm Springs Dam, and review dam management.
- Supplement first-priority barren streams as part of the coho salmon broodstock program. These streams include Willow, Sheephouse, Freezeout, Dutchbill and Green Valley creeks within the Guerneville HSA; Ward Creek in the Austin Creek HSA; and Mill and Felta creeks.
- Develop plans to improve riparian vegetation in Dry Creek and its tributaries.
- Support implementation of measures to modify flows in Dry Creek to provide summer rearing habitat for coho salmon.
- Increase habitat structure and complexity in Dry Creek to enhance habitat diversity, and provide depositional areas for spawning gravels for coho salmon (i.e., place LWD or large boulder structures).
- Encourage Sonoma County and the City of Santa Rosa to reduce habitat fragmentation and implement riparian improvements through land-use planning and use of conservation easements from willing landowners.
- Improve migration and summer/overwintering habitat through riparian restoration and erosion control in Forsythe Creek HSA.

Terrestrial and Wetland [171]

- Work with volunteer groups to place wood duck nest boxes in suitable habitat along the Russian River at Potter Valley, and along the upper mainstem Russian River to Hopland.
- Support retention of current zoning along Potter Valley and the upper mainstem Russian River to protect existing habitat values.
- Explore use of riparian conservation easements at Potter Valley.
- Enhance wildlife values on Lake Mendocino through cooperative efforts with the Army Corps of Engineers.
- Encourage stream enhancement in the upper watershed of the east fork of Austin Creek.
- Work to realize DFG land protection targets for 7,000 acres of the Laguna de Santa Rosa.
- Work to protect forestland on Willow Creek between land trust and state park property.
- Work to further land use planning and land acquisition programs in the Green Valley Creek watershed and Pitkin Marsh.

Coastal Trail, Public Access and Recreation[172]

- Work with private landowners to design a public trail from Fort Ross State Historic Park to Jenner.

Data Gaps

Data gaps for the Russian River HU include:

- Assessment of barriers to passage for anadromous fishes.
- Identification of water diverters. Review and modify water use based on the needs of coho salmon and authorized diverters. Particular attention should be paid to needs regarding changes to water diversion, in particular in Green Valley and Dutchbill creeks, which have been identified as current or potential streams that coho salmon inhabit but that go dry in some years.
- Identification and prioritization of oak woodland habitat.

Local Planning Information *(see Catalogue, Appendix 1)*:

- *Russian River/North Coast Parcel Analysis* and *Sonoma County Coastal Parcel Study*—Sonoma Land Trust
- *Laguna de Santa Rosa Total Maximum Daily Load (TMDL)*—North Coast Regional Water Quality Control Board, U.S. EPA
- *Phase 1 Final Report, Santa Rosa Plain Vernal Pool Ecosystem Preservation Plan*—Santa Rosa Plain Vernal Task Force
- *Russian River Action Plan, 2nd Edition*—Sonoma County Water Agency
- *Russian River Estuary Study 1992-1993*—Sonoma County and California State Coastal Conservancy
- *Russian River Resources Assessment and Public Access Plan*—California State Coastal Conservancy
- *Towards a Healthy Wildland Watershed: Willow Creek Watershed Protection*—Stewards of the Coast and Redwoods (formerly Stewards of Slavianka)

Bodega Hydrologic Unit

Bodega Head *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Setting

The Bodega HU is a small coastal unit centering around the developed coastal lagoon of Bodega Harbor. It includes the forested Salmon Creek drainage just north of the Bay, as well as two large coastal estuaries dominated by grassland and ranching—the Estero Americano and the Estero San Antonio. Together, they drain an area of 94,483 acres (148 mi^2).

Over 82 percent of the Bodega unit is privately owned, with the major public ownerships involving portions of Sonoma Coast State Beach stretching south to Bodega Head. Significant agricultural lands totaling 13 percent of the HU have been conserved through the efforts of the Marin Agricultural Land Trust, the Sonoma Land Trust, and the Sonoma County Agricultural and Open Space District.

The unincorporated community of Bodega Bay is a vibrant coastal community with a population of 1,400 largely oriented toward the tourist and service economy. The area's major transportation is along coastal Highway 1.

Resources

- Over 75 percent of the Bodega HU is covered in Annual Grassland and Agricultural classifications, with small complements of Redwood and Montane Hardwood. Special ecological

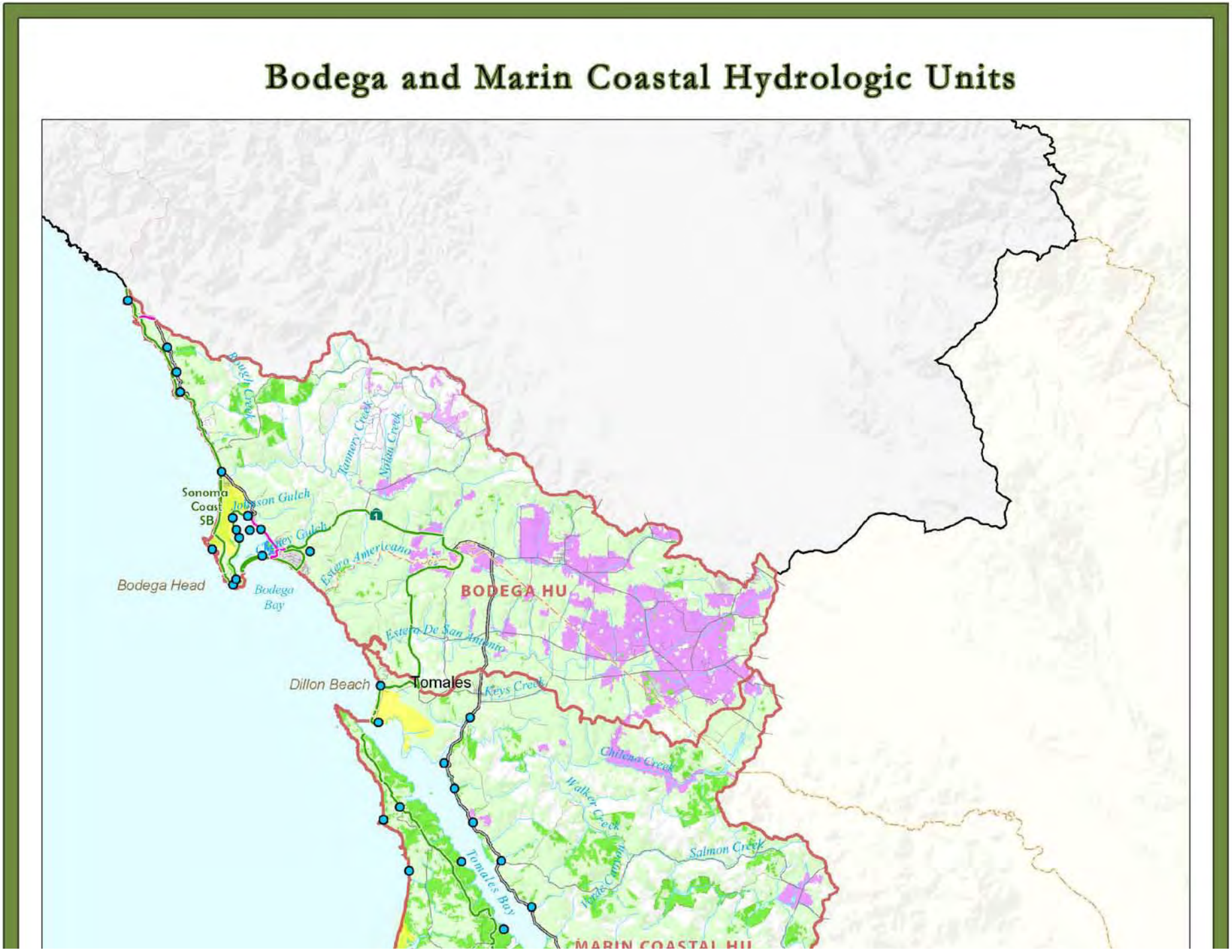
communities include: northern coastal scrub, northern coastal bluff scrub, northern coastal dune, coastal brackish marsh, coastal terrace prairie, and coastal and valley freshwater marsh.[173]

- A variety of special status wildlife species include: California freshwater shrimp, bumblebee scarab beetle, California brackishwater snail, tidewater goby, California tiger salamander, California red-legged frog, and western snowy plover.
- Bodega Head is a geologically unique outcrop that, in conjunction with the San Andreas Fault, has created Bodega harbor. The Bodega Head contains a large area of freshwater seeps and marshes, as well as saltwater marsh along the harbor's edge.
- The coast to the north of Bodega Head contains a stretch of coastal dunes that, where stabilized, are covered by dune shrub communities rather than the forest communities found farther north. In places the dunes continue inland to the shores of the harbor.[174]
- Rare and endangered plants include: Baker's goldfields, Baker's larkspur, Baker's manzanita, Blasdale's bent grass, coastal bluff morning-glory, Contra Costa goldfields, dark-eyed gilia, dune gilia, Franciscan onion, Marin knotweed, Myrtle's silverspot, Napa false indigo, North Coast semaphore grass, perennial goldfields, pink sand-verbena, Point Reyes bird's-beak, Point Reyes checkerbloom, Point Reyes horkelia, purple-stemmed checkerbloom, San Francisco Bay spineflower, San Francisco owl's-clover, showy Indian clover, Sonoma alopecurus, swamp harebell, Thamnolia lichen, Tidestrom's lupine, western leatherwood, woolly-headed gilia, woolly-headed spineflower, yellow larkspur.[175]
- The Esteros are two narrow and long saltwater estuaries including a variety of tidal mudflats, brackish and freshwater marshes. Eelgrass beds support Pacific herring, while sandy bottoms support a Dungeness crab nursery. A remnant native grassland community persists along the south bank of the Estero de San Antonio.[176]
- Salmon Creek supports steelhead and has historically supported coho salmon, and it supports a broad mix of riparian woodland and freshwater marshlands. Cheney Gulch to the south includes a short drainage dropping steeply from coastal scrub to riparian ravines and freshwater marsh.

Threats

- Watersheds within the HUs have a variety of water quality impairments, including excess sediment, high temperature, low dissolved oxygen, and excessive nutrients. Chronic erosion and sedimentation is the primary water quality challenge throughout the HU.[177] Primary problems facing coho salmon in the HUs are fish passage barriers on road crossings, high fine sediment loads, low summer stream flow, high summer water temperature, a shortage of cover in the form of LWD, and loss of riparian vegetation.[178]
- The integrity of Bodega Harbor and its surrounding watersheds is threatened by urban development in the town of Bodega Bay, with pollution from marine traffic and urban runoff among the main concerns. Shellfishing grounds in the harbor are currently impacted, and eelgrass beds are threatened.

Figure 7: Bodega and Marin Hydrologic Units Map




MARIN COASTAL HU
Point Reyes Station
Point Reyes
National Seashore
Olema
Point Reyes
Bolinas
Stinson Beach
Mount Tamalpais SP
Muir Beach
Golden Gate NRA
Marin Municipal Water District
400 Acres
N
Miles
0 1.25 2.5 5 7.5 10
Study Area
Hydrologic Unit (HU)
Large Forestland Ownership
Public Land
Coastal Access
Priority Coastal Trail Segments, SCC
Completed Coastal Trail Segments, SCC
Grasslands
Agricultural Lands
Coastal Wetlands
Dunes (Cooper 1967)
Interstate or Highway
Major Road
County Line
River, stream or creek
Prepared by
The Conservation Fund.
August 2005.
P:\proj_a_d\coris_fund\north_coast\ai\landuse\bodega_marin.mxd

- Coastal agriculture is threatened by competitive dairy market trends (primarily increased competition from large-scale production milk markets in the Central Valley) and increasing pressure for large-lot rural residential development.
- The August 2004 version of the Calfish Passage Assessment Database lists three potential barriers to fish passage in the Bodega HU. The Stemple Creek/Estero de San Antonio is listed as impaired on the federal 303(d) list of the Clean Water Act due to nutrients and sediment, while Estero Americano is impaired for sediment.

Priority Conservation Sites from Selected Plans

Though small, the Bodega HU exhibits a number of priority resources within the Salmon Creek watershed. Both TNC and Save-the-Redwoods League analyses have identified focal resources within the watershed, which supports steelhead and has historically supported coho salmon (but has no recent documentation of their presence). Salmon Creek is characterized by a deeply incised channel and highly active bank erosion due to steep topography and livestock grazing, and current management activities are largely focusing on water quality assessment and voluntary private landowner conservation initiatives.

General Action Recommendations

- County planning, public works, open space, and fire departments should continue to implement FishNet 4C priority goals for this region, which include: enact and enforce Marin County Streamside Conservation Area Ordinance; adopt and implement FishNet 4C's *Road Maintenance Manual: Guidelines for Protecting Aquatic Habitat and Salmon Fisheries for County Operations and Maintenance;* systematically work to restore coho salmon passage at county facilities; and address issues of sediment from roads through restoration and education.
- Continue to encourage private landowners to enhance wetland and riparian habitats.

Site-specific Action Recommendations

Aquatic[179]

- Continue to support landowners and the Marin RCD to restore riparian zones and manage livestock to increase stream protection and soil retention. Encourage sustainable land management practices and control of sediment sources in agricultural zones.
- Implement coho salmon passage improvements as identified in inventories conducted by Salmon Protection and Watershed Network (SPAWN), Taylor and Associates, Trout Unlimited, and the National Park Service (NPS). Expand inventories as needed for a comprehensive watershed approach for coho salmon passage.
- Support continued implementation of watershed restoration projects (e.g., *Sonoma County Coastal Wetland Enhancement Plan and San Geronimo Creek Watershed Sediment Source Sites Assessment*

and Evaluation). Augment inventories as needed.

- Continue to fund and support landowners to restore riparian zones and manage livestock to increase stream protection and soil retention. Encourage sustainable land management practices, and control sediment sources in agricultural zones.

Terrestrial and Wetland [180]

- Work to protect eelgrass beds in cooperation with local land management agencies.
- Support restoration of Laguna Lake, a historic seasonal wetland southwest of Petaluma on the Marin-Sonoma border.
- Support efforts to eliminate non-point source pollutants and protect streamside habitats in the Esteros.
- Monitor land-use planning to ensure that Salmon Creek habitats are not cut off from Bodega Bay.

Coastal Trail, Public Access and Recreation[181]

- Provide safe pedestrian access separate from State Highway 1 through the extension of the Kortum Trail between the Sonoma Coast State Beaches units at Wright's Beach and North Salmon Creek Beach.
- Complete a design plan for pedestrian and bicycle access through the community of Bodega Bay, including specific land acquisition and improvements needed to alleviate the current safety problems along Highway 1.
- Work with private landowners to acquire public access rights between Bodega Bay and Dillon Beach.

Data Gaps

Data gaps for the Bodega HU include:

- Assessment of barriers to passage for anadromous fishes.
- Conduct limiting factors assessment for coho salmon in the Salmon Creek estuary.[182]
- Assess feasibility of a water taxi across Bodega Bay.[183]
- Identify and prioritize oak woodland habitat.

Local Planning Information *(see Catalogue, Appendix 1)*:

- *Stemple Creek Total Maximum Daily Load (TMDL)*—North Coast Regional Water Quality Control Board, U.S. Environmental Protection Agency

Marin Coastal Hydrologic Unit

Lagunitas Delta, Tomales Bay *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Setting

The Marin Coastal HU comprises a major agricultural and natural reserve for the San Francisco Bay Metropolitan Area, retaining its undeveloped character despite its close proximity to millions of urban residents. Fog throughout most of the summer and cool rainy winters support an abundance of grasslands well suited to ranching, while toward the south the forested and rocky slopes of Mount Tamalpais and the Marin Headlands provide excellent hiking, biking and other recreational opportunities.

The HU is split 60/40 between private agricultural lands and public parkland, with large dairy ranches spread along the north and eastern stretches of the area, Point Reyes National Seashore (PRNS) to the west, and Golden Gate National Recreation Area (GGNRA), Mount Tamalpais State Park, and the Marin Municipal Water District to the south. The HU's major estuarine features are the 11-mile long Tomales Bay, stretching the length of the San Andreas Fault and draining the forested Lagunitas Creek, and Bolinas Lagoon to the south of PRNS.

The Marin coast is dotted with a number of small communities along Highway 1. These include the town of Tomales near Walker Creek; the isolated coastal development of Dillon Beach; Point Reyes Station and Olema along the Olema Valley; and Bolinas, Stinson Beach, and Muir Beach from Bolinas Bay south.

Resources

- Primary biotic associations in the Marin Coastal HU are annual grassland and coastal scrub, which together make up 50 percent of the HU. A good portion of these ecotypes occurs in the northern sections of the Walker Creek drainage, to the east of Tomales Bay, and in lowland sections of PRNS. Douglas fir, montane hardwood, coastal oak woodland, and some redwood make up much of the forested habitats along the ridges of PRNS and along the steep slopes of the Mount Tamalpais massif, as well as in patch woodlands throughout the eastern section of the HU.[184]

- Two series of significant dune communities exist in the HU. The smaller, along approximately two kilometers of Dillon Beach, reaches nearly three and one-half kilometers inland and is the more threatened in terms of private development. The larger system stretches along 18 kilometers of the PRNS between the granitic outcroppings of Tomales Point and Point Reyes. Here a complex mosaic of dune tongues extends several hundred feet inland, in many places affected by introduced beachgrass and ice plant.[185]

- Specialized communities include: central dune scrub, coastal and valley freshwater marsh, coastal terrace prairie, northern maritime chaparral, and northern vernal pool.[186]

- A variety of special status wildlife species include: California freshwater shrimp, peninsula Coast Range shoulderband snail, Ricksecker's water scavenger beetle, Central California Coho Salmon ESU, Central California Coast Steelhead ESU, California red-legged frog, burrowing owl, California black rail, saltmarsh common yellowthroat, western snowy plover, yellow warbler, and Point Reyes mountain beaver.

- Rare plants include: Baker's larkspur, beach layia, California beaked-rush, coast yellow leptosiphon, coastal triquetrella, Kellogg's horkelia, Marin checker lily, Marin knotweed, Marin western flax, Mason's ceanothus, Myrtle's silverspot, North Coast semaphore grass, Peninsula Coast Range shoulderband snail, Point Reyes meadowfoam, Point Reyes rein orchid, Raiche's red ribbons, robust spineflower, rose leptosiphon, Santa Cruz tarplant, showy Indian clover, Sonoma alopecurus, Sonoma spineflower, supple daisy, Tamalpais jewel-flower, Tamalpais lessingia, Tiburon Indian paintbrush, Tidestrom's lupine, Williams' bronze shoulderband, woolly-headed gilia, yellow larkspur,[187] and Mt. Tamalpais manzanita.

- Tomales Bay, a sunken rift valley of the San Andreas Fault, forms one of the longest tidal bays on the North Coast and includes hundreds of acres of important marshland and tidal flats along its 11-mile length. Walker Creek and Lagunitas Creek provide 75 percent of the runoff to Tomales Bay; both exhibit historically extensive wetlands now impacted by siltation. Large beds of eelgrass in the bay support a herring nursery and commercial fishery.[188]

- The Giacomini wetlands at the head of Tomales Bay have been diked and filled for nearly a century but have been recently acquired by the NPS and are in the process of restoration. Wetlands at Big Lagoon on the Redwood Creek drainage are also being evaluated for restoration.

- Nearly 100 species of water-associated birds make stopovers at Tomales Bay during migration along the Pacific Flyway.[189]
- Drake's and Limantour esteros are two of the largest saltwater lagoons along the Marin coast, and along with Bolinas Lagoon form the remainder of the Marin Coastal HU's shorebird and waterfowl migration sites.

Threats

- Two major reservoirs form barriers to coho salmon distribution in the HU: Soulajule Reservoir on Arroyo Sausal in the Walker Creek watershed; and the reservoirs formed behind Nicasio Dam on Nicasio Creek and Peters Dam on Lagunitas Creek, both in the Lagunitas Creek watershed.[190]
- Watersheds within the HUs have a variety of water quality impairments, including excess sediment, high temperature, low dissolved oxygen, and excessive nutrients. Chronic erosion and sedimentation pose the primary water quality challenge throughout the HU. Tomales Bay is listed on the federal Clean Water Act 303(d) list as an impaired water body for high concentrations of bacteria, nutrients, pathogens, metals (mercury), and sediment, and Walker, Lagunitas, and Olema creeks have been listed as impaired for sedimentation, nutrients, and fecal coliform bacteria. Tomales Bay aquacultural operations are periodically closed due to high nutrient loading during winter rains.
- Current information indicates that the primary problems facing coho salmon in the HUs are: the permanent loss of access to spawning and rearing habitat above Peters Dam on Lagunitas Creek and above Nicasio Dam on Nicasio Creek; fish passage barriers on road crossings; high fine sediment loads; low summer stream flow; high summer water temperature; a shortage of cover in the form of LWD; and loss of riparian vegetation. The Lagunitas and Bolinas subwatersheds have documented recent occurrences of coho salmon, while the Salmon and Walker creek subwatersheds historically supported the species.
- Coastal agriculture is threatened by development pressures from the Bay Area, despite 60-acre zoning, Williamson Act protections, and active efforts to implement agricultural conservation easements throughout the area.
- The August 2004 version of the Calfish Passage Assessment Database lists 158 potential barriers to fish passage within the Marin Coastal HU.

Priority Conservation Sites From Selected Plans

A number of overlapping plan priorities are found within the southern section of the Marin Coastal HU, particularly within the Lagunitas, Pine Gulch, and Redwood creek watersheds (TNC analyses, Save-the-Redwoods League's Focal Areas, Coastal Conservancy's Coastal Trail, and DFG's Recovery Strategy).

Lagunitas Creek, the largest drainage in the HU, consistently supports coho salmon and is considered of high restoration and management potential for the SONCC despite impacts from

sedimentation and dams. There are five dams on Nicasio Creek. It supports significant stands of redwood forest with several sub-watersheds classed high in complements of older forest riparian cover.

The Pine Gulch Creek watershed is located completely within public ownership, in PRNS and GGNRA, and it hosts a self-sustaining population of steelhead. Efforts to complete a public trail around Bolinas Lagoon are also under way. Redwood Creek is nearly completely in public ownership, stretching from the small private community of Muir Beach to the redwoods of Muir Woods National Monument. Approximately seven miles of Redwood Creek provide accessible habitat for anadromous salmonids, and this basin is considered one of the most productive and restorable basins for anadromous salmonid habitat in Marin County. Challenges include sedimentation from creekside roads, as well as an altered estuarine environment.

General Action Recommendations

- County planning, public works, open space, and fire departments should continue to implement FishNet 4C priority goals for this region, which include: enact and enforce Marin County Streamside Conservation Area Ordinance, adopt and implement FishNet 4C's *Road Maintenance Manual: Guidelines for Protecting Aquatic Habitat and Salmon Fisheries for County Operations and Maintenance;* systematically work to restore coho salmon passage at county facilities; and address issues of sediment from roads through restoration and education.
- Continue to fund and support landowners and the Marin RCD to restore riparian zones and manage livestock to increase stream protection and soil retention. Address water quality and nutrient loading issues by encouraging sustainable land management practices, controlling sediment sources, protecting riparian zones, and employing best management practices that encourage permeability and infiltration.
- Implement coho salmon passage improvements as identified in inventories conducted by SPAWN, Taylor and Associates, Trout Unlimited, and the NPS. Expand inventories as needed for a comprehensive watershed approach for coho salmon passage.

Site-specific Action Recommendations

Aquatic[191]

- Implement high-priority fishery enhancement projects for the reduction of sediment delivery and the restoration of riparian corridors as listed in the *Walker Creek Enhancement Plan* (2001).
- Develop a monitoring and assessment program for the estuarine reaches of Lagunitas Creek and intertidal reaches of Tomales Bay, looking at impacts to coho salmon rearing and emigration.
- Support continued implementation of watershed restoration projects (e.g., *Walker Creek Enhancement PlWalker Creek Watershed Enhancement Plan; San Geronimo Creek Watershed Sediment Source Sites Assessment and Evaluation; Lagunitas Creek Final Sediment and Riparian Management Plan; and Watershed Assessment and Erosion Prevention Planning Project for the Redwood Creek Watershed).an* Augment inventories as needed.

- Consider restoration of Olema Marsh, Bear Valley Creek, and the mouth of Olema Creek, to benefit coho salmon. The restoration should provide rearing habitat refugia during high flows, habitat protection, and food production. Hydrologic connectivity between marshes should be restored.
- In the San Geronimo Creek sub-watershed, continue public outreach and education for private landowners, residents, and commercial, public utility and county workers regarding best management practices to control erosion, protect riparian vegetation, retain LWD, and minimize disturbance to coho salmon from pets.
- In the San Geronimo Creek sub-watershed, encourage removal of non-native fish species from stock ponds where they are a threat to coho salmon.
- Look for opportunities to restore natural channel form and function in the upper watershed to protect summer flows into San Geronimo Creek.
- Encourage continuation of riparian protection and sediment control projects. Focus on working with landowners to manage livestock to protect riparian areas, and to implement erosion control projects on state and federal parkland and on private lands (e.g., Devil's Gulch).
- Continue to support restoration efforts on Bolinas and Big lagoons to benefit coho salmon during all life phases and seasons.
- Encourage the NPS to provide additional space to Stinson Beach Water District for off-stream storage to protect coho salmon in Easkoot Creek.
- Increase resource protection at Duxbury Reef through increased monitoring and enforcement.[192]

Terrestrial and Wetland [193]

- Raise water table through check-dam construction, and reduce the impact of invading cattails at Livermore Marsh.
- Restore tidal wetland where feasible at the head of Tomales Bay.
- Acquire marshland on the west side of Tomales Bay, and develop programs to confine livestock grazing to the west side of Olema Creek, while providing protection for wetland plants.
- Remove accumulated sediment, and evaluate bridges and culverts as obstacles to fish passage.
- Encourage designation of Bird Rock near Tomales Point as an "Area of Special Significance" due to its importance as a seabird rookery.
- Remove sediment, restore aquatic circulation, and increase tidal flushing at the northwest end of Olema marsh.
- Protect harbor seal pupping grounds and protect eelgrass beds in Drake's Estero.
- Remove abandoned landfill and causeway, and remove invasive vegetation at Bolinas Lagoon.

- Pursue wetland restoration at Rodeo Lagoon, removing the road and picnic area fills in the wetlands and relocating the trail encircling the upper lagoon.

Coastal Trail, Public Access and Recreation[194]

- Work with private landowners to acquire public access rights between Estero Americano and Dillon Beach.
- Improve Highway 1 corridor for non-motorized travel along the east shore of Tomales Bay.
- Work with private landowners to obtain trail easements across the protected open space east of Tomales Bay, and install improvements needed to minimize conflicts with working ranchlands.
- Work with the GGNRA and DPR to acquire parcels east of Tomales Bay and west of Highway 1.
- Work with the PRNS to connect existing trails through the park to create a continuous trail from the northern to southern extents of the park.
- Design and construct a trail adjacent to the coast through Mount Tamalpais State Park.
- Encourage the GGNRA to develop trails closer to the coast where topography permits.

Data Gaps

Data gaps for the Marin Coastal HU include:

- Identification and prioritization of treatment of coho salmon passage barriers, especially in the Redwood Creek drainage.
- Assessment of the role of water temperature as a limiting factor in coho salmon production. Assessment of the water temperature regime in Walker Creek during the summer season for three to five years.
- Continued assessment by Marin Municipal Water District of the release of water from Soulejule Reservoir to develop the optimum release for coho salmon.
- Limiting factors assessment for coho salmon in Keys Estero and Tomales Bay.
- Identification of habitat restoration actions in Nicasio Creek.
- Assessment of the feasibility of a water taxi across Tomales Bay (source: California State Coastal Conservancy, *Completing the California Coastal Trail).*
- Identification and prioritization of oak woodland habitat.

Local Planning Information *(see Catalogue, Appendix 1)*

- *Marin County Watershed Management Plan*—County of Marin
- *Big Lagoon Wetland and Creek Restoration Project: Part II: Feasibility Analysis Report*—Golden Gate

National Recreation Area

- *Big Lagoon Wetland and Creek Restoration Project: Part III. Addendum to Feasibility Analysis Report*—Golden Gate National Recreation Area
- *Bolinas Lagoon Ecosystem Restoration Project*—Marin County Open Space District
- *General Management Plan Update*—Point Reyes National Seashore
- P*olicy Review Initiative Final Repor*t—Marin County Open Space District, County of Marin, Dept. of Parks and Open Space
- *Redwood Creek Watershed: Vision for the Future*—National Park Service, Golden Gate National Recreation Area
- S*ediment overview report: Development of an Initial Sediment-Management Plan for Lagunitas Creek, Marin County, California*—Marin Municipal Water District
- *The Walker Creek Watershed Restoration Program*—Marin County Resource Conservation District
- *Tomales Bay Watershed Stewardship Plan: A Framework for Action*—Tomales Bay Watershed Council

Summary of General Recommendations Noted in HU Summaries

General recommendations that were found repeatedly in many of the plans are summarized below by topic.

Forest Ownership Recommendations [195]

- Evaluate opportunities to acquire land and/or conservation easements (forest banks, etc.) on non-industrial private forestlands in the region.
- Evaluate opportunities to acquire land and/or conservation easements (such as working forest easements) with industrial timber companies in the region. Companies that have extensive North Coast holdings include Pacific Lumber, Green Diamond Resource Company, Mendocino Redwood Company, and Hawthorne Timber Company. Implement a pilot working forest easement on the Mendocino Coast.
- Evaluate opportunities to secure conservation easements for water rights in watersheds where landowner diversions and withdrawals of water are negatively affecting aquatic habitat, such as in the Mattole River, Eel River, and Navarro River watersheds.

Forest Management Recommendations Benefiting Salmonid Species [196]

- Increase the canopy where it is not at acceptable levels, by planting appropriate conifer and hardwood species composition along the stream.
- Protect existing LWD structure; increase amounts in rearing habitat; and protect and maintain habitat associated with instream LWD, via landowner incentives where feasible.
- Ensure retention of mature trees in the riparian corridor.
- Establish adequate streamside buffer areas that are protected from vegetation removal.
- Work with landowners and other entities to improve the quality and quantity of deep pools, spawning gravels, and cover, by means of measures that: protect existing LWD recruitment potential through the retention of mature coniferous trees in the riparian zone; establish adequate streamside buffer areas, and recruit in-channel LWD.
- Continue to review THPs to ensure protection of riparian resources.
- Develop plans to restore and maintain stream habitat connectivity where low flow or sediment aggradation is restricting coho salmon passage. Plans should: evaluate management techniques; implement the identified strategy; and address permitting complexity for identifying implementation measures.

- Work with the State Water Resources Control Board (SWRCB) for their review of authorized diversions that have no provisions to protect coho salmon, and for identification of unauthorized diversions and enforcement actions to stop them.

Water Quality and Sediment Reduction Recommendations[197]

- Support the assessment, prioritization, and treatment of sediment sources, particularly roads, which have not been assessed, and acknowledge progress that has been made in addressing sediment sources.
- Implement priorities for road-related sediment reduction projects identified in existing road inventories projects.
- Identify areas still needing road/erosion inventories.
- Identify ongoing road maintenance needs.
- Identify landslide hazard areas such as steep unstable slopes, stream crossings (other than those identified in the road inventory), and inner gorge areas; conduct pre-project geological surveys and/or reduce management activities within these areas, especially road construction, grading, and intensive timber harvests.
- Identify and treat bank erosion sites.
- Continue road and watershed assessments to identify and prioritize sources and risks of road-related sediment delivery to watercourses.
- Reduce road densities where necessary and appropriate.
- Decrease potential for stream flow to become diverted at road crossings during high flow events, resulting in flow along the road that returns to the channel at undesirable locations.
- Stabilize slopes along roadways to minimize or prevent erosion and to minimize future risk of eroded material entering streams.

Invasive Plant Control

- Develop and support programs to control exotic vegetation, with emphasis on routes of dispersion (including road and trail traffic) and native revegetation projects.

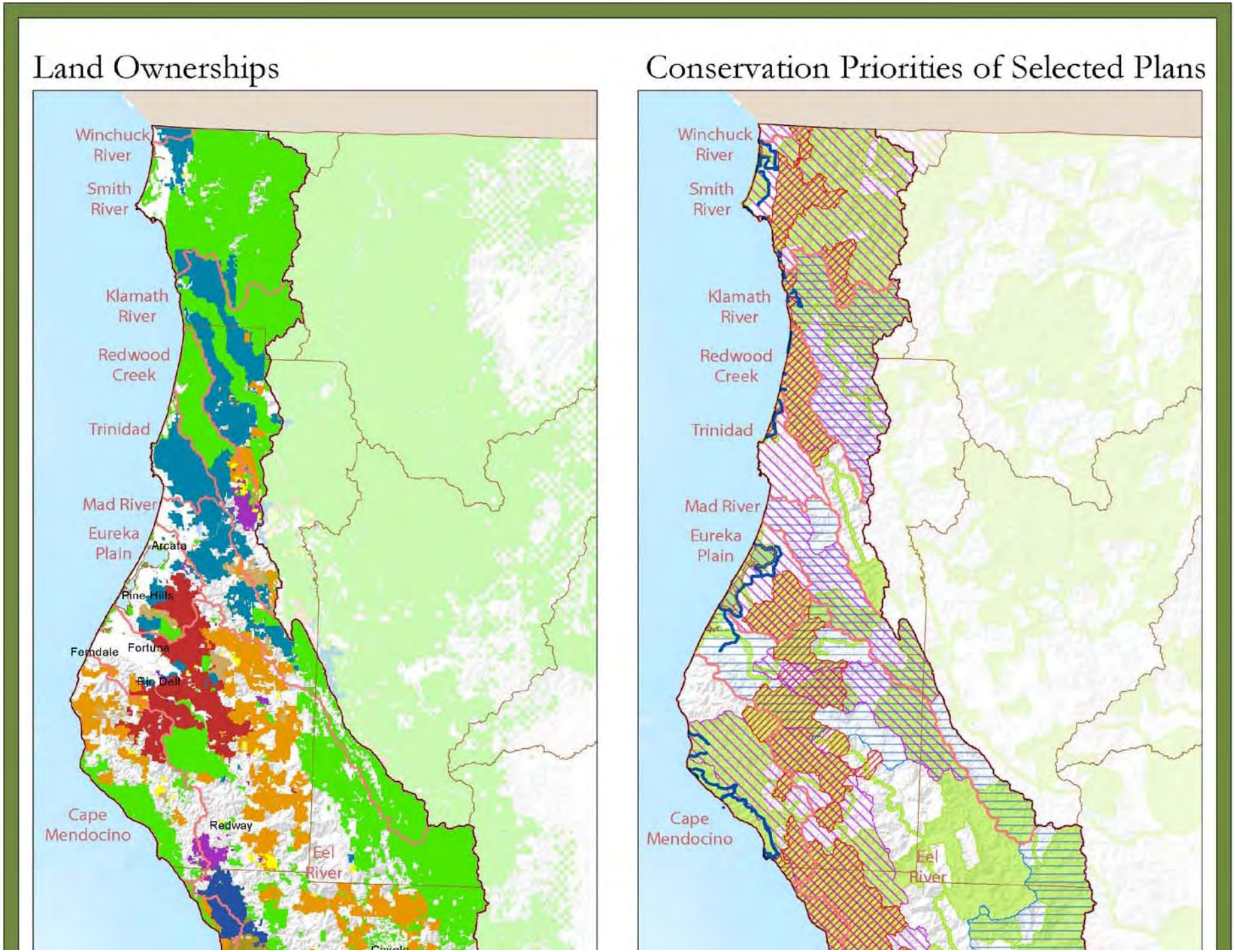
Barriers to Fish Passage[198]

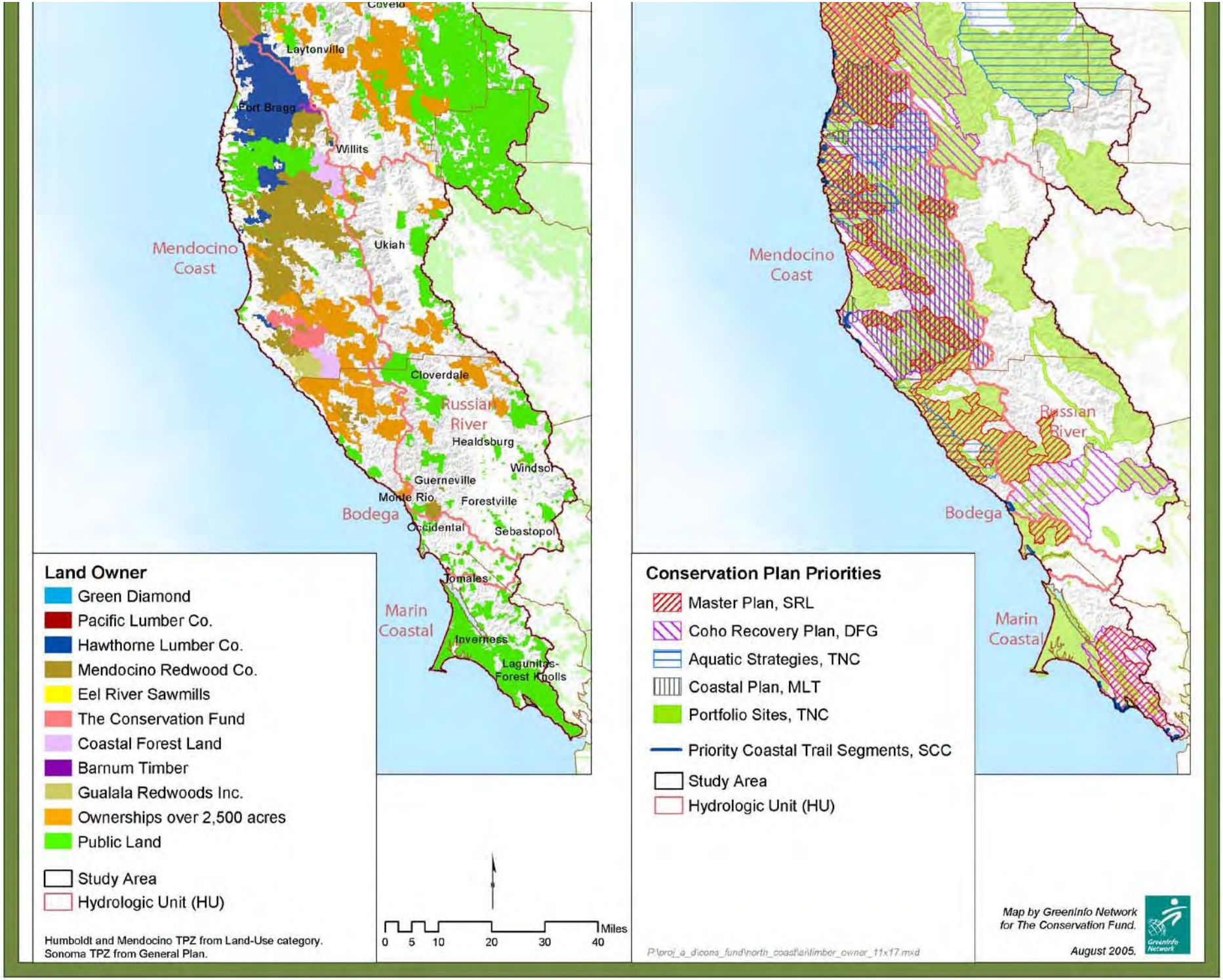
- Support efforts to prioritize and treat culverts on county and private roads that are barriers to fish passage.
- Encourage the county to coordinate with landowners on the removal of barriers to fish passage on private property.

Wetland Conservation

- Evaluate opportunities to acquire land and/or conservation easements from willing sellers on wetland, estuarine, and tideland areas within in the region.
- Promote riparian and estuarine restoration projects where feasible, in particular ones aimed at reestablishing natural estuarine channel function and riparian overstory canopy.
- Promote cooperative management among agencies and private landowners in tidal and estuarine flats under multiple managements.

Figure 8: Land Ownerships and Conservation Priorities of Selected Plans (Synthesis Map)




Covelo
Laytonville
Port Bragg
Willits
Ukiah
Mendocino Coast
Cloverdale
Russian River
Healdsburg
Windsor
Guerneville
Monte Rio
Forestville
Bodega
Occidental
Sebastopol
Tomales
Marin Coastal
Inverness
Lagunitas-Forest Knolls
Land Owner
Green Diamond
Pacific Lumber Co.
Hawthorne Lumber Co.
Mendocino Redwood Co.
Eel River Sawmills
The Conservation Fund
Coastal Forest Land
Barnum Timber
Gualala Redwoods Inc.
Ownerships over 2,500 acres
Public Land
Study Area
Hydrologic Unit (HU)
Humboldt and Mendocino TPZ from Land-Use category.
Sonoma TPZ from General Plan.
0 5 10 20 30 40 Miles
Conservation Plan Priorities
Master Plan, SRL
Coho Recovery Plan, DFG
Aquatic Strategies, TNC
Coastal Plan, MLT
Portfolio Sites, TNC
Priority Coastal Trail Segments, SCC
Study Area
Hydrologic Unit (HU)
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Map by GreenInfo Network
for The Conservation Fund.
August 2005.
GreenInfo Network

Part 2C:
Synthesis Map

The Synthesis Map illustrates coincidences (or overlaps) among priorities identified in certain of the conservation plans summarized in this Part 2. Priority areas identified in five of the seven selected plans are depicted in the Synthesis Map using varying colors and hatching symbols. In addition, priority California Coastal Trail segments from the Coastal Conservancy's Coastal Trail were added as line segments, while priority wetlands from PCJV's Strategic Plan were illustrated via Calveg coverage data.

Selected plans include three that largely prioritize terrestrial ecology (Save-the-Redwoods League's Focal Areas; TNC's Ecoregional Plan; and MLT's Coastal Plan, which also considers scenic and cultural resources); two aquatic prioritizations (DFG's Recovery Strategy, and TNC's Aquatic Recommendations); one wetland plan (PCJV's Strategic Plan); and one public access plan (Coastal Conservancy's Coastal Trail).

All plans selected for the Synthesis Map provided coverage of the entire study area, with the following exceptions: Save-the-Redwoods League's Focal Areas is limited to watersheds that historically contained coast redwood forest; MLT's Coastal Plan primarily addresses coastal Mendocino County; and TNC's Aquatic Recommendations includes a variety of priority basins throughout the region but does not consider anything south of the Russian River.

Careful examination of the map reveals several coincidences of high-priority resources, particularly in: the lower reaches of the Smith River and Lake Earl Plain; the lower reaches of Redwood Creek; areas in and around Humboldt Bay; much of the Mattole, Southern Eel, and central Mendocino county coast, including the Ten Mile, Big, Albion, Navarro and Garcia river watersheds. Somewhat more modest concentrations of priorities are found along stretches of the Gualala River and the middle reaches of the Russian River, as well as along the coast surrounding Mount Tamalpais in Marin County.

These overlaps reflect a diversity of natural resources and, of course, different institutional priorities. However, they do allow a few general observations. First, TNC's Ecoregional Plan provides the most general look at the region and consequently captures a larger and more comprehensive portion of North Coast resources. This plan's focus was on capturing representative samples of all of the region's representative and rare plant and animal species, as well as particularly important terrestrial and aquatic ecological communities. It is also the only plan within the synthesis that specifically addresses the widespread grassland and oak woodland communities that dominate in the eastern areas of the region[199]

Second, a number of terrestrial and aquatic plans converge upon relatively undisturbed, relatively older coastal forests. In attempting to locate extensive areas of large-diameter, old, and undisturbed redwood forest, Save-the-Redwoods League's Focal Areas can be thought of as capturing foundational pieces of North Coast forests that can effectively support older-forest dependant species such as marbled murrelet, northern spotted owl, and Pacific fisher. In addition, these forests provide critical habitat for a variety of threatened salmonid species, as reflected in the

coincidence of priorities from DFG's Recovery Strategy and TNC's Aquatic Recommendations. MLT's Coastal Plan captures a similar mix of forest and aquatic values, yet it incorporates a variety of coastal, scenic and cultural elements as well, providing a unique and somewhat more complex view of a smaller subregion.

Finally, it is worth noting what is not evident from the priorities of these selected plans, and what gaps in data and treatment follow from their methodologies and / or bias(es). First, all of the plans present scale limitations, having been developed from relatively coarse regional data using moderate to coarse geographic sub-units. This presents a problem in terms of location: the priority resources responsible for the selection of a particular area may not be present throughout that area, and different resources may be responsible for the selection of various individual priority areas. Caution is therefore advised in interpreting the location of various overlaps, as the mapping scheme that was used sought to interpret overlaps generally instead of delineating specific and well-defined focal overlap areas.[200]

Second, while these plans were developed with the best regional data available throughout the region, all (except the priority California Coastal Trail segments, which are mapped with great detail) exhibit a moderate degree of uncertainty. Regional GIS land cover layers are regularly mapped to a resolution of 30 meters or less, and, while not fully ground-truthed, they represent one of the most reliable inputs to the analyses. However, stand age and composition measures, and in particular old growth and riparian cover age determinations, are less reliable. In addition, presence/absence surveys for salmonids are widely available but inconsistent throughout the region, and in many places the data used for the Recovery Strategy relied on only two or three years of survey data.

Other factors are subject to sampling bias; examples include road densities (used in Save-the-Redwoods League's Focal Areas) and distributions of rare and endangered species (almost exclusively from CNDDB, and used in analyses by Save-the-Redwoods League, MLT, and TNC). Bias with the CNDDB exists primarily with respect to public holdings that have been subject to increased monitoring, as well as to private landholdings — including primarily large industrial timberlands — that have been subjected to relatively sparser surveying. While road layers adequately depict the great majority of permanent roads in the region, seasonal logging roads on private timberlands are much less comprehensively mapped and yet have a significant effect on aquatic resources in particular.

Part 3:
Assessment of the Political, Economic and Social Factors Shaping the Region, and Recommendations for Action

The "HU Summaries" in Part 2 provide a survey of important natural resources, threats to those resources, and priorities for conservation, as identified in selected conservation plans for the region. Not surprisingly, the priorities reflect the dominant features of the region: the temperate rain forests and associated fisheries and the string of rich coastal estuaries (many of which support a variety of agricultural activities) and dune systems.[201]

Part 2 also highlights how the legacy of industrial logging has affected (and continues to affect) aquatic and terrestrial resources in coastal watersheds and, more recently, how the increased pressure to convert forests, grasslands and farmlands to more intensive rural and agricultural uses presents a relatively new, but perhaps more permanent, threat to coastal conservation.
Part 3A looks in some detail at the political, social and economic conditions in the region to gain an understanding of what is driving the land uses and human activities that threaten the high-priority coastal resources identified in Part 2. Various factors, including land cover, land use, employment, housing, and key demographic data are summarized and analyzed. An examination of these conditions reveals certain factors that drive the dramatic socio-economic changes that are occurring now and that lie ahead for the region.

Part 3B consists of two sections. The first section—"Key Findings"—identifies the political, social and economic conditions that we believe have the greatest consequence for conservation of coastal resources. The second section—"Conclusions informing Development of Conservation Strategies"—presents our general conclusions about how to respond most effectively to the conditions presented in the "Key Findings." These conclusions provide the basis for the conservation strategy recommendations that follow in Part 3C.

Part 3C presents general recommendations for conservation strategies. Specific examples of each of the strategies are provided, and opportunities to develop new projects are identified.
Finally, in Part 3D, a large, strategically-located working forest conservation opportunity is presented in detail.

Part 3A:
Political, Social and Economic Conditions on the North Coast

1. Land Use

Public & Private Ownership

Much of the North Coast is largely in private ownership. Sonoma County has the highest percentage, with 93 percent of the total county land area privately owned. In Mendocino and Humboldt counties, 82 and 69 percent of each county area, respectively, is in private ownership. Marin County is 58 percent privately owned. Del Norte County has the lowest percentage of private land—just 23 percent—with much of the public land in Six Rivers National Forest (U.S. Forest Service). Humboldt County has the largest amount of federal land—over 500,000 acres—in Six Rivers National Forest (U.S. Forest Service), Redwood National Park (National Park Service), and King Range National Conservation Area (Bureau of Land Management). Humboldt County also has the largest amount of tribal lands—nearly 85,000 acres—in the Hoopa Valley Indian Reservation. Marin County has an extensive greenbelt of public land along the coast, consisting of the GGNRA and PRNS (both federal), Mount Tamalpais State Park, and protected watershed lands owned by the Marin Municipal Water District.

Table 1 : Land Ownership (acres) [202]

County	*Federal*	*State*	*Tribal /BIA*	*County*	*Private*	*Total*
Del Norte	**465,990**	**54,111**	**16,195**	**0**	**162,113**	**698,410**
Humboldt	**536,527**	**84,231**	**85,000**	**0**	**1,708,310**	**2,468,095**
Mendocino	**321,315**	**96,152**	**20,994**	**0**	**1,979,495**	**2,417,956**
Sonoma	**33,805**	**44,166**	**321**	**7,194**	**1,008,474**	**1,093,959**
Marin	**89,988**	**36,796**	**0**	**30,619**	**220,742**	**378,145**
Totals	**1,447,625**	**315,456**	**176,536**	**37,813**	**5,079,134**	**7,056,565**

Forest Land Cover and Ownership

Much of the North Coast region is comprised of forest land, dominated by highly productive coniferous forests of coast redwood and Douglas fir. The majority of forest land is in Humboldt and Mendocino counties; productive timber land accounts for over 50 percent of the total acreage in each county.[203] The two counties have a combined total of nearly three million acres—over 80 percent of the total 3.4 million acres of timber land in the five-county region.

Roughly 80 percent of timber land is privately owned—divided about equally between industrial timber ownerships and non-industrial ownerships—totaling 2.8 million acres. Nearly three-fourths of this private timber land is within designated Timber Production Zones (described further in Section 2).

The public forest land in the region is largely in National Park and U.S. Forest Service ownership, primarily in Humboldt and Mendocino counties (described above under Public & Private Ownership). The California Department of Forestry and Fire Protection also manages the 46,000-acre Jackson State Demonstration Forest in Mendocino County, the largest state forest in California. Other public forest land includes state parks, county park and open space lands, and water district properties, primarily in Sonoma and Marin counties.

Table 2: Timberland Ownership (2002) (in acres)[204]

County	*National Forest*	*Other Public*	*Industrial forest ownership*	*Private farmer*	*Other private*	*Total private*	*Total, all ownership*	*Timber Production Zone*
Del Norte	**157,000**	**0**	**135,000**	**5,000**	**23,000**	**163,000**	**320,000**	**122,000**
Humboldt	**262,000**	**15,000**	**608,000**	**290,000**	**312,000**	**1,210,000**	**1,487,000**	**994,000**
Mendocino	**116,000**	**111,000**	**591,000**	**99,000**	**386,000**	**1,076,000**	**1,303,000**	**854,000**
Sonoma	**0**	**14,000**	**68,000**	**57,000**	**164,000**	**289,000**	**303,000**	**78,000**
Marin	**0**	**0**	**0**	**6,000**	**13,000**	**19,000**	**19,000**	**0**
Totals	**535,000**	**140,000**	**1,402,000**	**457,000**	**898,000**	**2,757,000**	**3,432,000**	**2,048,000**

Agricultural Lands

Overall, agriculture represents a significant land use in the North Coast, accounting for one-quarter to one-half of all land area in every county but Del Norte. Much of this is rangeland used primarily for beef and dairy. The second highest agricultural acreage is devoted to vineyards for producing wine grapes; vineyards are most extensive in Sonoma and Mendocino counties, with some vineyard development in Marin County. Orchards account for a modest portion of farmland, primarily in Sonoma and Mendocino counties. Pears are still one of the leading crops in Mendocino, but many of the once extensive apple orchards in Sonoma County have been converted to vineyards. Cropland accounts for a fairly small portion of farmland acreage—less than five percent of the total farm acres—in Humboldt, Mendocino, and Marin counties.

Percentages of land in farm use have been decreasing in all counties but Sonoma, which increased by about ten percent in the early to mid-1990s. Marin and Mendocino counties have

seen the greatest loss of farmland, with decreases of 11 to 12 percent during that same period. Still, Marin County has 45 percent of its land area in farm use, which is considerable given its high land values and proximity to the urban Bay Area. Del Norte has the least amount of farmland, in number of farms, farm acreage, and percentage of land use (2.1 percent).

Urbanized Lands

Urban land uses in the North Coast region are concentrated along the Highway 101 corridor, with dense urban populations in many eastern Marin cities, Rohnert Park, Santa Rosa, Windsor, Cloverdale and Ukiah. On the coast, Crescent City, Eureka, Arcata and Fort Bragg are the largest cities. Roughly 50 percent of the region's populations live within incorporated areas, on average.

Del Norte is the least urban county in the North Coast region, with only 9,000 acres in urban use according to the California Department of Forestry and Fire Protection's *Forest and Range 2003 Assessment.* Mendocino County follows, with 17,000 acres of urban land. Humboldt and Marin counties each have 32,000 acres. Sonoma County has the largest urban landscape, with 85,000 acres devoted to urban uses. It should be noted, however, these numbers vary as a percentage of the total county acreage: Sonoma County is still the most urban, with close to one percent of its total land area committed to urban uses, while Mendocino is the most rural, with less than one percent of its land areas in urban designations.

2. Planning and Regulatory Environment

County General Plan Updates

Land use planning is largely controlled at the local level through the adoption by the County Board of Supervisors of a County General Plan. The General Plan provides a blueprint for all development within the unincorporated county and also influences planning policies within cities. In the North Coast region, all counties except Del Norte are currently involved in General Plan updates. A General Plan update is a lengthy process that may require three to five years to complete. Public input is solicited at several stages: to identify community issues, to consider alternative plan proposals, and to comment on a selected plan before final adoption by the County Board of Supervisors.

Local Coastal Program

Coastal counties are also regulated by the California Coastal Act of 1976, which mandates the conservation and development of coastal resources through a planning and regulatory process called the Local Coastal Program (LCP). The LCP functions as a land use plan for the coastal zone within each county and ensures that local government land use plans—both county and city general plans and zoning—are consistent with the goals of the Coastal Act.

The California Coastal Commission is the regulatory authority that oversees LCPs and proposed development, and that enforces coastal zone protections. Development activities, which are broadly defined by the Coastal Act to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters,

generally require a coastal permit from either the Coastal Commission or the local government.

Gaining coastal development permit approvals from the Coastal Commission can be notoriously difficult and time-consuming, and there is no question that since its creation in 1976 the Commission has significantly limited the amount of coastal development.

Zoning

Zoning has the most direct influence on land use and development. In the coastal portion of the North Coast region, the broad zoning categories governing most land use are: forest land, agriculture, recreation/open space, and residential. Zoning categories vary from county to county, and to a large degree reflect historic patterns of existing parcels.

Land use zoning regulates housing densities—and subdivision potential—by setting the allowable number of units per acre. Mendocino County, for example, includes both "rural residential" zoning—with lot sizes ranging from one to ten acres generally clustered in existing, unincorporated towns and villages—and "remote residential" zoning, which allows single-family homes on lot sizes generally ranging from 20 to 40 acres. Marin County land use plans include a range of residential zoning categories in the unincorporated coastal areas. "Coastal single family" zoning ranges from one unit per 5–19 acres to higher densities of four to seven units per acre, and "coastal multifamily" zoning allows five to ten units per acre.

These residential uses may encroach on productive agriculture and timber lands, as demand for country homes grows. "Ranchette" development and "hobby farms" have allowed some agriculture-zoned lands to be used primarily for residential estates with only minimal agriculture activity—a trend which reduces the economic viability of agriculture and contributes toward escalating land values.

Much of the private forest land in the North Coast is within county-designated Timber Production Zones (TPZ). Conversion of TPZ-zoned land to non-timber uses is regulated by the California Department of Forestry and Fire Protection and State Board of Forestry. In Sonoma County, however, a current proposal by County Supervisor Mike Reilly would create county regulations restricting the conversion of commercial timberlands to other uses. No other California county regulates timber conversions, but the issue is raising concerns in Sonoma and Napa counties because of vineyard expansions. The Department of Forestry and Fire Protection approved the conversion of 721 acres of timberland in Sonoma County between 1989 and 2001, approximately 0.9 percent of the county's TPZ-zoned acreage. CDFF argues that county regulations are unnecessary and would intrude on the state agency's regulatory authority.

Federal and State Regulation

There are wide ranges of federal and state statutes that establish regulatory authority over various aspects of land use. Several of these statutes have significant influence in the North Coast region and have engendered, and continue to engender, considerable controversy among landowners, agency staff, and environmental and community activists. The principal statutes are summarized below.

Table 3: Federal and State Environmental Statutes with Significant Influence in the North Coast Region

Statute	*Federal/State*	*Agency Authority*
Endangered Species Act	Federal	U.S. Fish & Wildlife Service
Clean Water Act	Federal	U.S. Environmental Protection Agency, U.S. Army Corps of Engineers
National Environmental Policy Act	Federal	U.S. Environmental Protection Agency
Coastal Zone Management Act	Federal	National Oceanic and Atmospheric Administration, California Coastal Commission
National Forest Management Act	Federal	U.S. Forest Service
Multiple Use Sustained Yield Act	Federal	U.S. Forest Service
California Environmental Quality Act	State	All State Agencies
California Endangered Species Act and the Natural Communities Conservation Planning Act	State	California Department of Fish & Game
Porter-Cologne Water Quality Act	State	State Water Resources Control Board
Z'Berg-Nejedly Forest Practice Act	State	California Department of Forestry and Fire Protection
California Coastal Act	State	California Coastal Commission

Other federal laws that affect the use of land and natural resources include the Clean Air Act,Resources Planning Act, Antiquities Act, Wilderness Act, and Organic Act.

The federal Endangered Species Act (ESA) establishes a process by which animal and plant species can be listed for federal protection. That protection limits any activity that may result in a "taking"—causing death to one or more individuals of that species either through direct action (such as hunting) or indirect action (such as destruction of its habitat). A species may be listed as "threatened" or "endangered," depending on the level of peril and the status of the remaining population, and an "endangered" designation carries a greater degree of protection. The U.S. Fish and Wildlife Service (USFWS) has authority for enforcement of the ESA.

The California Endangered Species Act (CESA) is the state law that complements the federal ESA; it is enforced by DFG. Many of the protected species in the North Coast—including northern spotted owl and coho salmon—are listed under both federal and state acts, and thus are protected by both federal and state agencies.

The state *Natural Communities Conservation Planning Act (NCCP)* provides for cooperative efforts to protect habitats and species. The primary objective of the NCCP program is to conserve natural communities at the ecosystem scale while accommodating compatible land use.

The listing of the northern spotted owl stands out as a regulatory action that has had broad affects in the North Coast region. The USFWS officially listed the northern spotted owl as threatened under the Endangered Species Act in 1990, sparking alarm over the potential impacts to the timber industry throughout the Pacific Northwest. Specific management plans were delayed, and government agencies were criticized for failing to develop and implement protections to safeguard habitat for the owl. The U.S. Department of Agriculture and the timber industry released estimates of the economic impacts in job losses and mill closures. Tension between concerns for the threatened species and concern over people in timber-dependent communities led to a polarized perspective of "jobs vs. owls."

In 1993, the federal *Northwest Forest Plan (NWFP)* was initiated to resolve conflicts over management of northern spotted owl habitat. The NWFP Record of Decision, in 1994, established an ecosystem-based approach to resource management.

The state Z'berg Nejedly *Forest Practice Act* was passed in 1973 to ensure sustainable and environmentally appropriate forestry in California. The state Board of Forestry and Fire Protection promulgates rules to implement the law. Over time, the legislature has passed many laws increasing its scope and detail. The Board has done likewise with the regulations. The process to permit timber harvest now involves a multi-agency review involving four state agencies and two or more federal agencies, depending on the location and issues involve. Other permits from other agencies—both state and federal—are often required.

Throughout the past decade, there has been a growing recognition that the current regulatory structure is complex, cumbersome, and a burden on landowners. Critics contend that it is too focused on paperwork and discourages good forest management.[205] The increase in laws, regulations, and process has been driven primarily by litigation, and has not contributed to making the process more rational. In addition, by focusing on the individual area where harvest is proposed, the process has tended to inhibit landscape level analysis and planning.

Not surprisingly, the cost of preparing the documents for permit approval has also increased significantly since 1973, putting the industry in California at a competitive disadvantage compared to timber landowners in other states. In response, the industry has focused considerable effort on getting out the message of its disadvantage.

Meanwhile, claiming that the laws and regulations are not producing an acceptable level of protection, environmentalists have worked with friendly, mostly urban, legislators to increase the regulation of timber management. In addition, other administrative actions have increased the level of agency oversight, for example a new, parallel permitting process for timber harvest conducted to meet the waste discharge requirements of the Clean Water Act.

Awareness of the problem and frustration with the current structure have grown to a point where most of the players involved express an interest in changing the process. Evidence of this can be seen in various legislative proposals in recent years, such as those that created alternative permitting processes like the Nonindustrial Timber Management Plan (NTMP) and the Programmatic Timber Environmental Impact Report (PTEIR). The Board of Forestry and Fire Protection

has held meetings and hearings about reforming the system, and created committees to develop proposals. The draft "Stewardship" NTMP is a recent example of this trend.

These varied efforts share some important common goals. Most would shift the process from one focused on voluminous paper work at the start, to a performance-based system that relies upon increased monitoring, greater enforcement, and actualizing adaptive management. Most nascent proposals would extend the term of operations for an approved harvest plan beyond the current limitation of three to five years. Many would create incentives, through permit streamlining, for landowners who manage their land more conservatively than required by the current rules.

At present, a variety of tools are being considered, including: creating new authorities; expanding the top acreage limit for the use of the NTMP; creating a new Stewardship NTMP to expedite federal approval; amending the existing PTEIR process; and greater use of the Habitat Conservation Plan process as provided in the Endangered Species Act. While expressing interest in reforming the process, some environmentalists are seeking conservation gains through any adopted change. Limiting clear-cut logging and expanding protection of water quality are often mentioned as key objectives.

The federal Clean Water Act establishes the broadest framework for water quality regulations, including the protection of wetlands. The Porter-Cologne Water Quality Act is the state corollary. Regulatory authority is coordinated between federal and state agencies, primarily the U.S. Environmental Protection Agency (USEPA) and the State Water Resources Control Board (SWRCB). The U.S. Army Corps of Engineers has permitting authority under Section 404(d) of the Clean Water Act, which regulates discharges (dredging and fill) into U.S. waters, including wetlands.

Section 303(d) of the Clean Water Act describes the regulation of "impaired water bodies," a designation given a water body that fails to meet specific water quality standards. Each state is required to maintain a list of impaired water bodies and to develop "Total Maximum Daily Loads" (TMDLs) for each impaired water body, to address both point and nonpoint sources of pollution. An implementation plan, also known as an action plan, identifies a program for implementing the necessary pollution load reduction requirements to meet water quality standards. While not strictly a requirement of the TMDL as described by the Clean Water Act and associated regulations, the action plan is required under the State Porter-Cologne Water Quality Control Act. In California, there are 509 water bodies listed as impaired; 28 of these are within the North Coast region. The North Coast Regional Water Quality Control Board is charged with developing most TMDLs in the region.

Many of the TMDLs in the North Coast are focused on sediment and temperature pollution, both of which generally are generated from nonpoint sources such as stormwater run-off and erosion from roads, especially logging roads and unpaved rural residential roads. Poor timber harvest practices can impact stream health by causing loss of riparian vegetation and increased sedimentation. Agricultural activities can also impact water quality. On rangelands, grazing in riparian areas can destroy vegetation and contribute to higher water temperatures; dairies can be sources of nutrient pollution when dairy waste is not properly managed. Row crops and vineyards can be serious sources of sedimentation and inputs of pesticide and fertilizer pollution into waterways.

3. Population and Growth Trends

According to Census 2000 data, the total population for the North Coast counties—Del Norte, Humboldt, Mendocino, Sonoma, and Marin—is just under one million. Nearly half of the population is in Sonoma County (464,800), and another quarter of the population resides in Marin County (250,100). Del Norte County is the least populated (28,200), followed by Mendocino County (87,400) and Humboldt County (127,700).

In the period between the 1990 and 2000 censuses, populations in all counties have grown. Interestingly, the highest rates of growth are in the most populated (Sonoma) and least populated (Del Norte) counties, each with population increases of about 20 percent. Humboldt, Mendocino, and Marin counties all experienced population increases of seven to nine percent. Growth projections for the next ten years show relatively steady rates of growth for Del Norte (22 percent) and Sonoma (20 percent) counties. Humboldt and Marin counties are expected to grow at a somewhat declining rate (6.9 percent and 5.4 percent respectively). Mendocino County, however, is projected to increase growth from 8.85 percent (1990-2000 period) to 18.1 percent (2000-2010 period) (see Table 4).

Population projections for 2050, by the state Department of Finance, show the greatest increases in total population in Sonoma County—from just fewer than 500,000 in 2000 to nearly 800,000 in 2050, an increase of 72 percent. Mendocino County is projected to grow from 87,000 in 2000 to over 118,000 in 2050, an increase of 36 percent. Only Marin County is projected to decrease in population.

Consistent with the rural character of the North Coast, a large portion of the population lives in unincorporated areas. In the northernmost counties, a majority of the population lives in unincorporated areas. In Del Norte and Sonoma counties, the percentage of population in unincorporated areas has declined; in other counties it has grown slightly (see Section 1—Land Use).

California has the second largest Native American population in the U.S., second only to Oklahoma. The northern counties of the North Coast region—Del Norte, Humboldt, and Mendocino—have relatively large populations of Native Americans. Compared to the state average, where Native Americans make up just one percent of the state population, Native Americans represent roughly five to six percent of the population in those three counties, and represent a number of tribal affiliations, including: Tolowa, Karuk, Yurok Hupa, Whilkut, Wiyot, Nongati, Bear River, Mattole, Sinkyone, Lassik, Wailaki, Yuki, Cahto, Coast Yuki, and Pomo. There are at least 23 rancherias and reservations in the North Coast, which encompass over 170,000 acres.

Table 4: Total Population, Population Change, Projected Growth[206]

County	*Total population*	*Percent population change 1990-2000*	*Percent Projected population change 2000-2010*
Del Norte	28,200	+20.2	+22.3
Humboldt	127,700	+ 7.2	+6.9
Mendocino	87,400	+ 8.8	+18.1
Sonoma	464,800	+19.7	+19.9
Marin	250,100	+ 8.7	+5.4

4. Employment

In many North Coast counties, the local economy and job market have historically relied on natural resource industries, particularly timber and fishing. Employment in these areas has declined steadily, and jobs are shifting from goods-producing to service-producing industries.

Del Norte County has the smallest total population and the smallest work force of the North Coast counties. Overall, government is the largest employer, providing 44.7 percent of all jobs in 2002. The construction of Pelican Bay State Prison in 1990 provided a boost to the local economy, and the prison is now Del Norte's largest single employer; other major government employers are city (Crescent City) and county government and Del Norte County Unified School District. Del Norte has the highest unemployment rate in the region—10.7 percent compared to the statewide 7.0 percent in 2000.

Humboldt County is experiencing a shift from resource industries to education, trade, transportation, and hospitality industries. Like Del Norte, government is the largest employer, providing 27 percent of all jobs in 2002. Education and health care provide over 12 percent of jobs. Five of the ten top employers in the county are Humboldt State University, College of the Redwoods, Humboldt County Office of Education, Mad River Community Hospital, and St. Joseph Hospital. Pacific Lumber Company and Green Diamond Timber Company remain two of the top ten employers.

Mendocino County has seen an increase in jobs in government and leisure and hospitality, while other industries have declined or remained flat. Government is the largest employer, providing 23 percent of all jobs in 2002; the majority were with city, county, and Indian tribal governments. While timber has historically been a major driver in the county's economy, wine grapes have replaced timber as the top income producer. Major employers range in industry type and in geographic area, with government jobs centered in Ukiah and Fort Bragg. Advanced Manufacturing (metal products) in Willits, Fetzer Vineyards in Hopland, and Harwood Products (lumber and construction materials) in Branscomb are three of the top ten employers in the county

Sonoma County has the largest work force in the region, with roughly one-quarter of a million workers. Due to its proximity to San Francisco, Sonoma is influenced by the economy and job markets of the larger Bay Area. While some workers commute outside the county, most employment is based in-county. Education/health care and leisure/hospitality have steadily increased in jobs, while natural resources/mining (including timber) and agriculture have declined. The job market is centered in Santa Rosa, with a few major manufacturing employers—Advanced Fibre Communications and Agilent Technologies—based in Petaluma and Rohnert Park.

Marin County has the second largest workforce in the region, with over 125,000 workers in 2000. Like Sonoma, Marin is influenced by the job market of the larger Bay Area, and a larger number of workers commute outside the county. Within Marin, employment is strongest in retail sales, finance, real estate, and management services. Major employers include S&P Co. and Westamerica Bancorporation, Fair Isaac & Co, and Fireman's Fund Insurance.

5. Housing & Real Estate

Housing Overview

Much of the North Coast region is rural in character, with urban areas concentrated along the Highway 101 corridor and around the county seats of San Rafael, Santa Rosa, Ukiah, and Eureka. Housing distribution and development follow this pattern, with most housing units and highest rates of new housing development in the urban and suburban areas. Housing patterns also reflect current population and population growth, with the most housing developments in Sonoma County and the least in Del Norte County. Patterns of development reflect county and city zoning, as well as other economic factors, including land values, transportation corridors, and local economy (see Section 2—Planning and Regulatory Environment, and Section 1—Land Use).

Del Norte County, with the smallest county population in the North Coast, also has the lowest number of existing units and fewest new housing permits. Del Norte County has the lowest median home values in the North Coast—$121,100 compared to the statewide median of $211,500. Home ownership rates, however, are among the highest in the region and higher than the statewide average.

Humboldt County ranks third in the region in numbers of existing housing units and of new housing units. The number of new housing units authorized by permits is nearly equal to that of Marin County, which has twice the population. Humboldt County ranks fourth of the five North Coast counties in home values, with a median value of $133,500. Home ownership rates are lowest in the North Coast (57.6 percent) but comparable to the statewide average (56.9 percent).

Mendocino County's population falls between that of Del Norte and Humboldt counties, as does its number of existing and new housing units. Median home values rank third in the region, at $170,200—still below the statewide median. Home ownership rates (61.3 percent) are higher than Humboldt County, but lower than the rest of the North Coast counties.

Sonoma County, which has the highest population of the North Coast counties, also has

the highest number of existing housing units and highest number of new housing permits. With its county population of nearly half a million—and a total county acreage of one million acres—2002 figures show over 2,500 new housing units authorized by building permits in Sonoma County, compared to 593 for Marin County or 284 for Mendocino County. Median home prices in Sonoma are considerably higher, too, at $273,200—over $100,000 more than the median value in neighboring Mendocino County.

Marin County supports a population roughly half the size of Sonoma County, and somewhat more than half the number of existing housing units. The number of new housing units authorized by permits, however, is only about one-fourth that of Sonoma. Median home prices are by far the highest in the North Coast—nearly twice that of Sonoma County and three times that of Mendocino County. Home ownership rates are fairly high, though, and comparable to Sonoma and Del Norte counties.

Home Values. Housing production in California declined significantly in the 1990's, while the population continued to grow. At the same time, record low interest rates have stimulated home sales. The shortage of housing combined with increasing demand has fueled skyrocketing prices in housing values for both new homes and resale homes. In addition, some of the rising cost is attributed to a shrinking supply of land available for building within urban growth boundaries. As elsewhere in California, home prices in the North Coast have risen dramatically over the past ten years. According to U.S. Census, between 1990 and 2000 median home values have risen 36 percent in Sonoma County, 37 percent in Mendocino County, and 52 percent in Humboldt County. These trends have only escalated in the last several years.

Median home values illustrate patterns of regional real estate values. In the North Coast region, median home values are lower than the statewide median in the northernmost counties—Del Norte, Humboldt, and Mendocino—while median values in Sonoma and Marin were higher than the statewide median. Furthermore, median values represent a wide range that varies within each county. In the North Coast, home prices in the coastal areas can be quite variable. For example, according to the Mendocino County General Plan Housing Element (2004), in 2002 the median home sales price in Fort Bragg was $210,000, while nearby in Mendocino the median value was $480,000. Both values were well above the countywide median of $170,000. Comparatively, housing prices were significantly lower in the northern inland part of the county, such as in Laytonville, where the median value was $90,000.

Housing affordability. Home ownership rates are strong indicators of housing affordability. Statewide, California's 2002 home ownership rate of 58 percent was fourth lowest in the U.S., nearly ten percentage points below the nationwide average. According to a report by the non-profit group, the California Budget Project, just 29 percent of California households could afford to buy a median-priced home, compared to a nationwide figure of 57 percent.

While housing costs are generally lower in much of the North Coast region than in other parts of the state, home prices have risen at a greater rate than wages, so that affordable housing becomes increasingly limited. For example, the Sonoma County General Plan Housing Element (2001) notes that, in 1999, more than half of all new homes sold in unincorporated Sonoma

County were priced over $300,000. In order to afford a home at this $300,000 price range, a buyer would need an annual household income of approximately $85,500; however, the median household income for that year was just over $53,000. Resale values for single-family homes continue to increase as well. In the unincorporated areas of Sonoma County, in 2000, only 32 percent of homes were sold at prices affordable to moderate- income families (up to $245,000), and only 11 percent were within reach of low- income households (up to $163,000).

Affordability of rental housing follows a similar pattern. The California Budget Project report notes that fair market rents are often beyond the means of low-income wage earners. For example, in Humboldt County, a minimum-wage earner would need to work 55 hours per week to afford a one-bedroom apartment. In Mendocino County, the number climbs to 65 hours per week; in Sonoma County, 102 hours per week.

Property taxes. Like median home values, property taxes broadly reflect patterns in real estate values. Property tax rates are lowest in Del Norte County (about half the statewide average) and Humboldt County, while in Mendocino, Sonoma, and Marin counties, property taxes are above the per capita state average.

Undeveloped property values. An important factor related to increasing home values is the increasing cost of undeveloped property. A recent article in Sonoma County's *Santa Rosa Press Democrat* noted that, "…homebuilders said they must contend with a shrinking supply of land suitable for housing within growth boundaries around cities and rising prices for such land—nearly tripling over seven years."[207]

Urban growth boundaries and urban limit lines encourage infill development, a "smart growth" policy intended to reduce urban sprawl into rural and agricultural areas. However, some developers resist infill residential development, claiming there is too little profit in mixed-use residential and commercial complexes. One such project proposed for downtown Santa Rosa was abandoned, and a parking lot is now planned for the site.

Undeveloped property values continue to rise in the unincorporated, rural areas as well. Despite the high costs of home building, and the additional restrictions placed on building on agriculturally zoned property, there is a steady demand for undeveloped land, particularly in the coastal zone. One measure of this demand is evident in the shrinking inventory of land available for sale. For example, in coastal Mendocino County, in the 1990's there were generally around 300 active listings and roughly 30 to 50 sales per year of undeveloped land. Thus the lands available for sale represented a six- to ten-year supply for the market. During the past five years, land sales have jumped up dramatically—with a peak of 166 sales in 2000—effectively using up much of that supply. Currently, the number of properties listed is roughly equal to the number of sales each year, reflecting the market demand for coastal property.

Agricultural lands. Economic boom times in the 1990's stimulated an increase in purchase of large properties—generally zoned for agricultural use—for residential development. The trend toward developing rural agricultural land for uses that are primarily residential and only secondarily agricultural has significant influences on land values, and triggers fears that the proliferation of "hobby farms" will undermine economically viable agricultural operations.

In some cases, large ownerships have remained intact. A wealthy buyer may purchase land restricted by a Williamson Act[208] contract and maintain the required agricultural use by leasing much of the acreage for grazing, farming, or vineyards, while developing a residential compound on just a portion of the property. In other cases, large ranches have been subdivided into smaller "ranchettes" that result in a shift in the land use pattern from agriculture to low-density rural residential use. The subdivisions may conform with existing agricultural zoning—for example, a 300-acre ranch divided into five home sites in an area zoned for 60-acre minimum parcels.

Some of these country estates or ranchette homes are quite large—with 10,000 square feet or more of living space, plus outbuildings and guest cottages. While the number of these large homes is a small portion of new home development, the trend has sparked local opposition; opponents argue that such homes are out of character in rural farming communities. In response, some county planning agencies are attempting to impose limits to housing "footprints."

Another significant influence on agricultural land values in the North Coast region is vineyard development. Despite the over-planting of vineyards in the 1990's that resulted in the current "wine glut," lands that have potential for vineyard development continue to sell at extremely high prices—$50,000 to $70,000 per acre in some areas. One of the factors affecting value is whether a property lies within a designated American Viticultural Area (AVA), and some AVAs are more valuable than others, based on the prices a wine with that appellation can command.

The rising cost of rural land in much of the North Coast—especially in the coastal zone—limits the market for sales of agricultural land to agricultural buyers. Farmers and ranchers who want to expand their operations are the most likely buyers of farmland, though the high capital cost of purchasing land may be prohibitive. Some potential sellers—such as farmers or ranchers who want to retire—may lease their lands rather than sell them, providing them an income and ensuring the land will continue to be farmed.

Certificates of Compliance. One of the significant factors affecting the value of rural land is the number of legal lots within a single legal ownership. Market value for one large parcel of land is usually less than the value of two or more adjoining lots of the same total acreage. Multiple lots allow for more flexibility in how the land is developed and sold, and therefore command a higher per acre value. This is particularly true in coastal and agricultural areas, where there is strong demand for rural residential development.

The subdivision of land is regulated by the Subdivision Map Act, which requires division of land to result in legal lots that conform to the local General Plan and current zoning. Subdivision can be a lengthy and costly process, requiring review and approval by local government planning agencies and, where applicable, by the state Coastal Commission. A similar but less complicated process is a lot line adjustment, which allows a landowner to adjust the configuration of parcels without increasing the number of lots.

A provision in the state Subdivision Map Act allows for bypassing the subdivision process through the use of Certificates of Compliance (CCs). Local governments are required to issue CCs if a landowner can provide evidence—usually through historic title documents—of parcels that existed prior to current subdivision laws. These "grandfathered" parcels may be recognized even if they do not conform to current zoning standards. Some see CCs as a loophole in the regulatory

process that increases the threat of development in sensitive or scenic areas, while others consider CCs a means of "reasserting title" to pre-existing parcels.

Some counties have tried to hold the line on CCs and lot line adjustments that conflict with local land use plans, but many of these attempts have been short-lived or have been challenged in court. In 2001, a state bill was passed—SB 497—that revised the certificate of compliance and lot line adjustment sections of the Subdivision Map Act, requiring that lot line adjustments of five or more parcels must comply with the subdivision map requirements of state law and local ordinances.

CCs are also being used to attempt to circumvent the restrictions of the Williamson Act, a state law that allows agricultural landowners to receive property tax valuations based on agricultural land values in exchange for a commitment not to convert the property to a non-agricultural uses. A recent case in Humboldt County involves a 13,000-acre ranch near Garberville, the owner of which has obtained CCs based on federal patents that predate subdivision laws. The County is filing a suit based on the argument that some of the newly created parcels are smaller than the minimum size allowed under Williamson Act contracts filed on the property.

6. Business and Industry Trends

Forestry

In terms of total acreage, forestry is by far the most pervasive industry in the region. As outlined in section 3A.1, more than 3.4 million acres of forestland are owned by industrial or non-industrial owners in the five-county region. The majority of this forestland is in Humboldt and Mendocino counties, whose combined total of three million acres accounts for more than 80 percent of all the forestland in the region. In Humboldt County, two industrial timber companies own a total of more than 580,000 acres. In Mendocino County, two industrial timber companies own a total of almost 400,000 acres.

These vast holdings were assembled over the last century, as the predecessors of the current owners acquired and aggregated many smaller parcels from homesteaders and others emigrating to the cities during the early to mid-twentieth century. As a consequence, these large holdings are comprised of hundreds of smaller parcels most of which are eligible for certificates of compliance, thus enabling the subdivision of these large forestland holdings without the significant permitting and environmental oversight that usually is required to subdivide land.

In the past, the economic value of these smaller parcels has not been competitive with the value of ongoing timber production, and they were largely ignored. But, as is described in more detail below, the future of the North Coast timber industry has never been more precarious. Investor expectations, inventory depletion, foreign competition and regulation are forcing timber companies to sell or turn to other land uses to wring a return from their holdings. Consequently, many forestland owners are looking at converting their properties to "higher and better uses" that may yield a greater financial return; and rural residential subdivisions and vineyard conversions are increasingly common on the North Coast. As a result, there is a very real threat to the ecological integrity of these vast private forestlands and the aquatic and terrestrial species that inhabit them.[209]

The timber industry developed in the North Coast region in the early 1800's, with the logging of redwood trees along the coastal rivers. The first mills were built in locations, such as Fort Ross and the Russian River in Sonoma County, that allowed logs to be floated downstream, where they were milled and shipped down the coast to San Francisco Bay. Marin County towns in the northern San Francisco Bay area—the aptly named Mill Valley and Corte Madera ("cut wood" in Spanish)—became important mill towns and shipping centers for redwood lumber.

In Humboldt County, logging began somewhat later but grew rapidly, with vast forests of redwoods around Humboldt Bay quickly cut down. In 1854, the town of Eureka had only nine sawmills; within 30 years the Humboldt coast had 400. Mills sprang up along the Mendocino coast in the mid-1800s; the lack of protected harbors meant that small lumber schooners were used instead of large ships to transport wood to market.

Throughout the 20th century, the timber business remained cyclical; production rose and fell in response to broader economic conditions. During the Depression, the timber industry slowed dramatically, then began to pick up during World War II. In the years after the war, a huge housing boom stimulated timber production again and created a new market for Douglas fir—once considered a "trash tree"—as well as redwood. The number of coastal sawmills tripled between 1945 and 1948. In Humboldt County, lumber production nearly doubled from 1949 to its peak in 1959.

This dramatic increase in harvest levels was facilitated by the post-war introduction of more efficient and powerful mechanized harvesting equipment, such as trucks and tractors. In addition, until 1977, California's *ad valorem* tax on standing timber induced landowners to harvest their lands simply to avoid the tax. This tax scheme had a very significant effect on timber harvest practices on private land in California.

Timber harvest levels are now trending downward. This is primarily the result of the regional liquidation of timber inventories, associated with decades of industrial timber management of private lands,[210] and the increased cost of permitting and environmental regulation of the industry.[211] The withdrawal of national forest lands from the timber base, as a result of the listing of the spotted owl, and the adoption of the Northwest Forest Plan have further constrained timber supplies. Finally, the globalization of the industry, and attendant competition from "fiber farms" in places like Canada, Russia and South America, provide further disincentives to continued owning and operating of forestlands in the region.[212]

Left unchecked, these forces will dramatically alter forest land-use patterns in the region, with profound consequences for forest-dependent natural resources.

> [T]he potential loss of the wood products industry accentuates several major challenges. One challenge is retaining private forests in forest cover. Private forests provide large public benefits in the form of various goods and services, including watershed protection, wildlife habitat and open space…. Thus it is in society's interest to retain the majority of these lands in forest cover… But with a decline of major markets for wood products, what incentives will these private owners have to retain or manage their lands as forest? Where timberlands are located in expanding metropolitan regions or in remote locations suitable for second homes, subdivision is a profitable possibility.[213]

The effects of these forces are evident elsewhere in the United States already. For example, in May of 2005, Rayonier, one of the nation's largest timberland owners, announced it was establishing a real estate subsidiary to focus on developing portions of its 2,000,000 acres that have the greatest potential for development. This comes as Rayonier executives recognize that "due to demographic changes…, a large amount of [their] timberland holdings have much higher value for development… than for growing timber…." While Rayonier's timberlands are largely in the southeastern portion of the U.S., the same demographic and economic forces that drove Rayonier's decision also are emerging on the North Coast.

This pattern is exacerbated by the recent emergence of TIMOs and timber-based REITs, vehicles for institutional and individual investors attracted to the prospect of current income and long-term capital appreciation of forestlands. The number of TIMOs has increased from five, five years ago, to approximately 20 today. The availability of large sums of investment capital has induced many traditional, vertically integrated forest products companies to divest their forestlands in order to focus on manufacturing.

The increasing prominence of TIMOs and REITS, and their focus on achieving competitive investment returns, is dramatically changing forest management and the prospects for forest conservation across the country. Among the changes are increased harvest levels to enlarge short-term returns, more aggressive sales of "higher and better use" properties (often for subdivision) to take advantage of capital appreciation of forestlands, and more sophisticated negotiation of conservation transactions.

These changes are quite evident in California. Two large, vertically integrated forest products corporations with a major presence on the North Coast, Georgia Pacific and Louisiana Pacific, both sold their lands by 2000. Over the next four years, both companies went on to sell all of their timberland elsewhere in the country (to focus exclusively on manufacturing and distribution), but it is telling that they sold their California lands first. The purchasers of those properties, Green Diamond, Hawthorne Timber Company, and Mendocino Redwood Company, have largely maintained them as working forests, but they are not averse to selling timberland for economically higher and better uses (or, importantly, for conservation) at prices far higher than their current value for timber production.

Fragmentation of forestland properties is evident at a smaller scale as well: in 2004, the 76,000-acre former Coastal Forestlands ownership was divided into three pieces. A portion was purchased and conserved by a partnership among The Conservation Fund, TNC, and the State of California (through the Coastal Conservancy and the Wildlife Conservation Board); it has been established as the region's first working forest owned by a non-profit. A portion remained as a locally owned, private, working forest, and a portion was sold to a vineyard developer who has announced plans for up to 10,000 acres of vineyard conversion.

The decline in timber production, the increase in operating costs, and the increased efficiency of production methods has also caused many mill closures in the region. In 2000, there were 26 timber mills operating in the North Coast counties of Del Norte, Humboldt, Mendocino, and Sonoma. Between 2000 and 2003, eight timber mills were closed in the region, leaving 18 currently in operation. As recent closures at Pacific Lumber have shown, these mills remain precariously balanced, and other closures are possible. Harwood Forest Products addresses this

through a unique and disturbing strategy: a large portion of their logs for processing is imported from British Columbia and Washington. The fact that it can be more cost-effective for Harwood to buy logs out-of-state and transport them over a thousand miles, with several costly loadings and unloadings, than to buy them locally, is a very telling indicator of the cost of growing and harvesting timber on the North Coast.

Despite these significant declines in harvest volumes, and the attendant ripples through the regional economy, the North Coast still accounts for a third of California's timber production. Half of California's annual timber revenue comes from Mendocino and Humboldt counties, where the value of redwood harvest in 2000 was $390 million, 43 percent of the total value for the state. The forest products industry is "extremely important" to many local economies in the Northern California "timber counties," generating about 13 percent of the personal income and 16 percent of the jobs.[214]

Dairy

California is the leading dairy state in the U.S., producing 20 percent of the nation's milk and cheese. In 2002, California's dairy industry represented $47 billion in economic activity, making it a greater contributor to the state's agricultural economy than the $33-billion California wine industry. Much of the state's dairy industry is located in the San Joaquin Valley, where large industrial dairies and processing plants continue to expand. As large-scale dairy producers, distributors and retailers have merged, milk prices have fallen. To keep up with lower prices, many dairy owners have boosted production with larger herds and use of growth hormones (such as rBST), leading to an increasing supply of milk and driving prices further downward.

Increasing health, safety, and environmental regulations pose additional costs for dairy producers. The Clean Water Act and other federal and state water quality laws have required improvements in dairy facilities and operations to prevent manure and waste from seeping into waterways. Flood management regulation also affects many dairies, which have traditionally been built near streams and in river floodplains.

Dairy farms have been a significant part of North Coast landscape for over 100 years. In the Humboldt and Del Norte counties, dairies were first built along the coastal bottomlands in the late 1800's. Dairies were also established in the coastal hills of Mendocino, Sonoma, and Marin counties, where spring rains and mild temperatures support year-round grasslands for grazing.

In the past ten years, dairies have declined in numbers; however, production levels have remained relatively steady. The average size of a dairy has grown, with a greater number of milk cows and higher milk production per cow. Still, dairies are pressured by rising costs (from increased regulation, labor, and transportation costs), fluctuating milk prices, and strong competition from industrial dairies in the Central Valley. In addition, high land values and development pressure from expanding urban and suburban growth—especially in Sonoma and Marin counties—make it increasingly difficult for family farmers to keep their lands in agricultural use.

Dairy farmers in the North Coast must also cope with water quality and flood management regulations. Given the high rainfall and frequent flooding events in the far North Coast region, dairies may be required to build manure ponds large enough to store four month's worth of

waste—facilities that can cost up to $200,000. Dairies located within the Coastal Zone are also required to obtain coastal development permits. Dairies in low-lying areas may be in designated wetlands, triggering further regulatory requirements and associated costs.

North Coast dairy farmers are developing several strategies in response to low milk prices and competition with large dairy producers. One is to *diversify* the range of dairy products, reflecting both decreasing demand for fluid milk and increasing demand for cheese, ice cream and other high-value products. For example, Humboldt Creamery, a dairy cooperative with facilities in Ferndale and Loleta, processes 100,000 gallons of raw milk per day into dozens of products, from ice cream to milk powder to be used in candies, desserts, and sport drinks.

Statewide, nearly half of all California milk goes to cheese production. The North Coast region supports a growing number of local cheese companies, including "farmstead" cheese makers. Farmstead cheeses command a premium price; to be labeled farmstead, the producer has to raise the animals, milk the animals, and make the cheese all in one operation.

North Coast dairy farmers are also developing *marketing strategies* that appeal to consumers who prefer dairy products that are hormone-free and produced on family farms. In addition, consumer concern about the conditions in industrial dairies has led to new market niches for dairy-product companies that certify their cows are treated well. Sales for Petaluma-based Clover/Stornetta Farms have grown since the American Humane Association certified all the ranches that supply it with milk. Certified organic dairies have also begun operating in the North Coast.

Wine Grapes

In California, wine grapes are the second most valuable agricultural commodity, following dairy products. The value of wine grapes has grown enormously in the past decade—from $840 million in 1992 to an estimated $1.76 billion in 2002. The number of acres in wine grapes has nearly doubled in the last ten years, as well—from approximately 331,500 acres in 1992 to an estimated 570,000 acres in 2002.

In the North Coast region, Sonoma and Mendocino counties are the dominant wine producers. Sonoma County ranks fourth statewide, with nearly 60,000 acres planted in wine grapes and 172 commercial wineries. Mendocino County ranks tenth statewide, with 16,000 acres in wine grapes and 41 commercial wineries. Marin and Humboldt counties each have eight commercial wineries. Compared to San Joaquin Valley growers, North Coast vineyards are relatively small—roughly 60 percent are less than 25 acres, and only 20 percent are 50 acres or more in size.

In Sonoma County, the wine grape production represents two-thirds of the total value of agricultural production. (In 2002, wine grape value was roughly $375 million out of a total $565 million.) The Sonoma wine region has traditionally been centered in Sonoma Valley—closely linked, both historically and geographically, with Napa Valley to the east. Over the past century, vineyards were planted throughout the county in sheltered valleys, such as Alexander Valley, Dry Creek, and along the Russian River. In the 1990's, vineyard development expanded further west toward the coast and onto steeper slopes. Areas that might have once been considered marginal for wine grapes are quickly being converted to vineyards. Many orchards around Sebastopol—an his-

toric apple-growing area—are being pulled out for vineyard development. There has also been an increase in smaller vineyards, in association with "hobby farms" and rural "trophy homes"—where wine grapes are grown for aesthetic, rather than economic, purposes.

In Mendocino County, the value of wine grapes exceeded the value of timber for the first time in 2001. In 2002, the value of wine grapes was over $81 million, approximately 64 percent of the total agricultural production value of $127 million. Of particular significance is the value of organic wine grapes: in 2002, Mendocino County produced over $7 million in organic wine grapes, which accounted for about half of the statewide total of organic wine grape value. Mendocino's wine-growing areas are centered in the Anderson Valley and along the Russian River near Ukiah, though vineyards are being developed further west toward the coast, as in Sonoma County.

Fishing & Aquaculture

Four key harbors account for much of the commercial fishing activity in the North Coast region: Crescent City, Eureka (Humboldt Bay), Fort Bragg (Noyo Harbor), and Bodega Bay. In 2002, the total commercial fish catch value for the North Coast region was more than $26 million. The Eureka area had the largest fish catch in weight (nearly 17 million pounds), with a total value of over $7.7 million. The Fort Bragg area had a somewhat smaller catch in weight (roughly 11 million pounds) but with a higher total value of over $8.2 million. Crescent City and the Bodega Bay region brought in $5.5 million and $4.8 million, respectively. The aquaculture industry produced nearly $6.7 million in 2002, in oysters, mussels and clams.

Statewide, commercial landings (number or pounds of fish unloaded at the dock) declined roughly 40 percent between 1981 and 1999. Much of the decline was in specific fisheries, particularly tuna. Declines in fish stocks and increasing restrictions on groundfish and salmon fisheries have reduced the catch for these species as well. Some fisheries, such as crab, Pacific herring and shrimp show no significant changes.

During the same period, 1981 to 1999, the number of commercial fishing vessels in California also declined, by roughly 60 percent. While some vessels fished outside California, a large majority fished solely in their principal area. In the North Coast, the number of commercial fishing vessels has declined significantly—from over 1,600 in 1981 to just under 600 in 1999. Over 80 percent of those vessels land only in North Coast ports. The average revenue per boat, however, increased over that period, from $24,500 to $60,800.

Increasing costs and decreasing catches have driven many smaller fishing operators out of business in the North Coast region. In the early 1980's, nearly 1,000 commercial vessels—over half the commercial fleet—earned less than $5,000 per year. By the late 1990's, less than a third of the fleet earned less than $5,000 per year.

Tourism

Tourism has become an important driver in the North Coast regional economy. According to a 2003 report prepared for the California Travel and Tourism Commission, tourism generated travel expenditures in the region of over $2.2 billion in 2001. Included in this figure is more than $700 million in wages and salaries earned by employees in businesses that benefit from travel spending.

Tourism creates jobs (nearly 37,000 jobs in 2001)—positions directly related to travel services, such as hotel and park staff. Tourism jobs can be especially important in small communities, such as coastal towns and rural areas, where employment opportunities can be scarce. Many of these jobs, however, are seasonal and may pay relatively low wages, creating a low-income service-worker population in areas where housing costs are high.

Also included in the 2001 total is more than $43 million in local taxes and $97 million in state taxes generated by travel expenditures. One particular benefit to local communities is income derived from transient occupancy taxes, a tax on hotel room rates that is one of the few sources of unrestricted funds available to local governments. In Mendocino, Sonoma, and Marin counties, for example, transient occupancy tax revenues grew by roughly 50 percent between 1992 and 2000. Sonoma County alone took in more than $5.5 million in hotel tax revenues in 2000.

Sonoma County supports the largest tourism economy in the region, generating over $952 million in travel expenditures and supporting more than 15,000 jobs in 2001. Marin County also draws millions of visitors to its state and national parks, providing nearly $530 million in travel expenditures and supporting more than 7,000 jobs in 2001. Humboldt and Mendocino counties each generated roughly $300 million in travel expenditures and supported about 6,000 jobs in 2001. Travel expenditures were lowest in Del Norte County, at just under $100 million, and provided 2,250 jobs.

In local coastal communities in the North Coast, many residents and business owners look to tourism as a growing source of jobs and local revenues to offset the declines in fishing and timber economies. In April 2004, the first Mendocino Coast Economic Outlook Conference was held, featuring six panels of business leaders and experts in regional industries. Panelists discussed the significant decline in local tourism after September 11, 2001, and the economic decline that followed. Still, many were optimistic that tourism will rebound and that domestic travel will make unique destinations such as the Mendocino coast particularly appealing.

Regional highlights

The wine grape-growing region of Sonoma and Mendocino counties is a major visitor attraction in the North Coast. Given its proximity to the San Francisco Bay area, Sonoma County draws both business and leisure travelers, and about half of all leisure travelers to the county visit on day trips. Overnight travelers generally stay in hotels or bed-and-breakfast lodgings, though there are some state park camping facilities in the Sonoma Valley area. The Sonoma wine region has also become a popular location for business meetings and conventions; business travelers make up nearly one quarter of all visitors in Sonoma County. The wine regions in Mendocino County, such as Anderson Valley, are less developed for tourism. Despite the further distance from the urban Bay Area, day visitors still make up about half of all travelers in Mendocino County. Business travel accounts for only about eight percent of visitors countywide.

The coastal region of the North Coast provides spectacular scenic and recreational opportunities, drawing millions of visitors each year. State, national, and county parks provide public access to many beaches and coastal areas. PRNS and Sonoma Coast State Beach together bring nearly five million visitors annually to the region.

Further north, a string of state and local parks provide beach access and camping facilities along

the Sonoma and Mendocino coastline; these include Stillwater Cove and Gualala Point county parks; Manchester and Caspar Headlands state beaches; and Salt Point, Van Damme, Russian Gulch, and MacKerricher state parks.

North of Mendocino, State Highway 1 turns inland, and driving access to the coast is limited. Despite the difficult access, however, the rugged scenery draws nature-loving travelers to the "Lost Coast" to visit the King Range Conservation Area and Sinkyone Wilderness State Park. For visitors not camping or backpacking, hotels and tourist services are available in Shelter Cove. North of the city of Eureka, coastal access and camping are available at several beaches and parks, such as Clam Beach County Park and Patrick's Point State Park. Further north, coastal recreation is associated with Redwood National Park (described below).

The centerpiece of California's redwood parks is in Humboldt and Del Norte counties. Together, six state and national parks—Redwood National Park and Jedediah Smith, Del Norte Coast Redwoods, Prairie Creek Redwoods, Grizzly Creek, and Humboldt Redwoods state parks—attract more than 1.4 million visitors annually. Both public and private campgrounds and RV parks provide overnight facilities for weekend and summer vacationers, as well as for retirees who may spend a month or more.

The Russian River area in Sonoma County is another major tourist attraction in the redwood region. Visitor services are oriented toward day use travelers and those who rent or own vacation homes in the area. Austin Creek State Recreation Area and Armstrong Redwoods State Reserve offer camping and hiking in the Russian River area. Other popular redwood parks include Jackson State Demonstration Forest and Hendy Woods State Park in Mendocino County, and Mount Tamalpais State Park and Muir Woods National Monument in Marin County.

Visitor Facilities

The North Coast region offers a variety of lodging options, ranging in availability and price, and including numerous bed and breakfast inns (B&Bs). Though the prices for B&Bs vary depending on the time of year and location, on average the nightly cost ranges between $120 and $200. Inns with special attractions, such as spas, tend to be in the $300 range. Many B&Bs in the North Coast region operate out of old houses with only a few units that tend to fill up quickly in the high tourism season (summer and early fall). Reservations are usually necessary in high season, during which time many B&Bs require a two-night minimum stay.

Some coastal communities are venturing into ecotourism, recognizing the value of the scenic resources most travelers come to the North Coast region to enjoy. In Arcata (Humboldt County), plans are under way to develop an overnight facility that includes both camping sites and a 30- to 50-room lodge, to be built with sustainable materials. The lodge would cater to visitors attracted to Arcata Marsh and wildlife sanctuary, as well as to nearby state beaches and redwood parks.

Affordable accommodations in the North Coast are widely available for campers. According to the California Department of Forestry and Fire Protection's 2003 Forest and Range Assessment, the Klamath/North Coast region has over 17,000 developed campsites. Of this total, 2,360 campsites are found in state parks in the region, and 1,269 campsites are on federal lands managed by the U.S. Forest Service, National Park Service, or Bureau of Land Management. City- and

county-run campgrounds provide 730 sites. Nearly 13,000 campsites in the region are privately owned—roughly three-fourths of the total number.

Recreational Fishing

Sport fishing, like commercial fishing, is managed by DFG. DFG sets limits, regulated through the sale of fishing licenses, on the catch size and number for freshwater and marine fish and shellfish. Sport fishing license fees for 2004 ranged from $32 to $88 for resident or non-resident annual permits. Additional fees are required for some species such as salmon and abalone.

Sport marine fishing in the North Coast region is popular out of boat harbors in San Francisco, Bodega Bay, Fort Bragg, Eureka, and Crescent City. Charter vessels typically take 18 to 40 passengers on day trips, charging $50 to $65 per person, with rates up to $150 per person for albacore tuna trips. Charter boats are required to have a Commercial Passenger Fishing Vessel (CPFV) permit, and some commercial fishermen supplement their income by offering day trips for sport fishing.

Steelhead trout is prohibited for commercial fishing but remains open, on a limited basis, for sport fishing. Steelhead were once abundant throughout California's coastal streams and Central Valley rivers, and were a primary food source for many Native American tribes. Now, most sport fishing for steelhead is limited to coastal rivers north of San Francisco Bay, with an estimated 69 percent of anglers fishing north of the Mattole River and 15 percent fishing on the north-central coast between the Mattole River and the Golden Gate. Due to declining populations, the wild steelhead fishery is restricted to catch-and-release fishing; hatchery steelhead (identified by a missing adipose fin) may be kept in selected fishing areas in season. Anglers are required to purchase a "steelhead report card" and return it to CDFG with fishing data.

Abalone is another species closed to commercial fishing but open to sport fishing, which is popular in the North Coast: Mendocino and Sonoma counties account for 96 percent of sport abalone diving in the state. Strict limits are placed on methods of take (abalone can only be collected by free diving), as well as catch size and numbers. CDFG surveys show declining numbers of young abalone, indicating a decline in reproduction. Areas nearest to access point are becoming depleted, so that divers have to travel further from access points to find legal-size abalone. Still, sport diving for abalone has remained popular, and total catch sizes have been high.
These sport fisheries are linked to the once-abundant natural resources of the North Coast region, which have declined from a range of pressures including overfishing and degradation of marine and freshwater habitats. Even with increasing restrictions and declining catches, however, fishing-related tourism remains an important draw to the North Coast.

California Coastal Trail

The California Coastal Trail is a proposed system of connected trails along the entire 1,300-mile coastline. The notion of a statewide trail goes back to the 1970's, first with Proposition 20 in 1972 that provided for "hiking, bicycle, and equestrian trails…along or near the coast." The California Coastal Act of 1976 supported the potential for such a trail by requiring local governments to identify trail alignments in their local coastal plans. More recently, in 2001, Senate Bill 908 (Chesbro)

directed the Coastal Conservancy—working with the State Coastal Commission and DPR—to create a plan that describes how the California Coastal Trail can be completed. This plan, *Completing the California Coastal Trail,* was submitted to the state legislature in January 2003.

Completing the California Coastal Trail includes an analysis of the status of current trails and what improvements would be needed to complete the entire California Coastal Trail system. The report estimates that existing public trails cover 40 percent of the proposed California Coastal Trail. Another 40 percent of the California Coastal Trail is inadequately developed as trails but runs over public land or along public highway. The remaining 20 percent, privately owned, will likely involve acquiring trail land in fee or easement from willing sellers, as well as the physical construction of trails.

The North Coast counties include 564 miles of the proposed California Coastal Trail—about 43 percent of its entire length. Nearly 262 miles of that coastline have existing trails considered adequate, according to the 2003 report. What remains in order to complete the trail in the North Coast is roughly 100 miles of highway corridor improvements, 100 miles of acquisition and trail construction on private land, and 100 miles of trail improvements on public land. The estimated cost for completing the trail in the North Coast counties is over $100 million (see Table 5, below).

Table 5: California Coastal Trail—Improvements Needed (2003) [215]

County	*Highway Corridor Improvements (miles)*	*Acquisition/ Construction Private Land (miles)*	*Acquisition/ Construction Public Land (miles)*	*Current Improvements Adequate (miles)*	*Totals (miles)*	*Estimated Cost to Complete ($ millions)*
Del Norte	4	4	17	46	71	$10.26
Humboldt	3	50	9	92	154	$46.24
Mendocino	54	25	7	41	127	$24.47
Sonoma	26	7	4	25	62	$11.36
Marin	17	9	66	58	150	$23.27
Totals	**104**	**95**	**103**	**262**	**564**	**$115.6**

Part 3B:
Significant Factors Affecting Conservation Strategies

From our review of the array of facts and figures presented in Part 3A, certain factors emerge that we believe are essential to understanding the changes in land use and related human activities that threaten the high-priority coastal resources identified in Part 2. These factors are presented in this section as "Key Findings." These findings form the basis for the Conclusions Informing Development of Conservation Strategies outlined below, in Section 2.

1. Key Findings

Land Use—Status and Trends

1. With the exception of Del Norte and coastal Marin counties, the study area is largely in private ownership.[216]
2. The high percentage of public land in Marin and Del Norte counties provides significant protection and stability of management for important coastal resources.
3. 3.4 million acres—roughly half of the total of seven million acres of land in the North Coast region—is privately owned forestland. These forestlands are split almost evenly between industrial and non-industrial ownerships. [217]
4. The region's history of industrial timber management has created a pattern of very large industrial ownerships, particularly in Mendocino and Humboldt counties.
5. Each of these large properties has many hundreds of underlying parcels, many of which qualify for a "certificate of compliance" allowing subdivision without full governmental review.
6. Farm and range land accounts for one-quarter to one-half of all land area in every county but Del Norte.
7. The region is largely rural, a consequence of its rugged topography, limited access and, until recently, predominantly resource-based economy.
8. Urban land use is largely concentrated around Highway 101 and seats of county government, with the most intense urbanization in Marin and Sonoma counties and the coastal cities of Eureka and Arcata.

Demographics and Trends in Growth and Development

9. The region is one of the least populated in the state, with a total of just under one million people.

10. The threat of conversion of coastal resources is greatest in the southern part of the region, proximate to the Bay Area's large urban populations. Fully 75 percent of the North Coast region's nearly 1,000,000 people live in Marin (25 percent) and Sonoma (50 percent) counties. In effect, there is a threat "gradient" from south to north that is a function of this proximity to urban population centers and associated infrastructure.

11. Sonoma and Mendocino counties are expected to grow at rates approaching 20 percent in the decade ending in 2010, adding more than 100,000 people. Marin, Del Norte[218] and Humboldt counties are expected to add approximately 12,500, 8,700 and 6,000 people, respectively.

12. Home prices in Del Norte, Humboldt and Mendocino are below the statewide median. In Marin and Sonoma, home prices are significantly above the median. This disparity in relative affordability is attracting an increasing number of people to the three more northerly, once rural counties.

13. Affluent buyers from the Bay Area and beyond, looking for a second home or hobby ranch, are driving up the price of rural lands in all North Coast counties. These rising costs limit the market for sales of undeveloped land to agricultural or forestland buyers, further reducing the viability of these economic uses in the region.

14. The trend of rising values of rural land, coupled with the abundance of parcels that qualify for certificates of compliance (thereby avoiding subdivision regulation), is accelerating the division and conversion of large, productive farm, range and forestland properties to rural residential and other uses that are often incompatible with coastal resource conservation.[219]

Political and Regulatory Factors

15. Federal and state endangered species laws—particularly the listings of the northern spotted owl and coho salmon—will continue to restrict timber harvest levels and increase the costs of management and compliance for the timber industry.

16. Federal and state water quality regulation of forestry, dairy and grazing activities in the region have increased costs of operation and raised uncertainty regarding future operability of forests, farms, dairies and ranches.

17. The North Coast is the focus of efforts to protect and restore coho salmon, outlined in the California Department of Fish and Game's Recovery Strategy.

18. Both industrial and non-industrial forest landowners state that complying with the Forest Practices Rules has become increasingly expensive and time-consuming, putting forestry in California at a competitive disadvantage in an increasingly global forest products market.

19. Environmental advocacy and activism, in response to development, harvest permits and agricultural intensification in the coastal zone and watersheds, is intense and often effective in delaying or stopping activities that are perceived to impair or degrade coastal resources.

20. Public protests and litigation over proposed timber harvest plans have created a strongly polarized political climate in the North Coast region, especially in the heart of the redwood region in Humboldt and Mendocino counties.

21. The Coastal Act and the oversight of land use policies and permits by the Coastal Commission have limited, and will continue to limit, intensive development of land within the coastal zone.[220]

22. Limited management funding will constrain public agencies' ability to acquire lands for parks and preserves.[221]

23. On the North Coast, county governments and economic development interests cite concerns about the local fiscal and economic effects of establishing parks and preserves.

Changes in Economic Activities and Employment

24. While resource industries still contribute to the region's economy, employment in these industries has declined steadily, and jobs are shifting from goods-producing to service-producing industries.

25. As a consequence of global competition, regulation and other factors, many major forestland owners and mills have divested or moved out of California, and the remaining operations are less profitable and more vulnerable to conversion to other uses.

26. However, half of California's annual timber revenue comes from Mendocino and Humboldt counties (the value of redwood harvest in 2000 was $390 million, 43 percent of the total value for the state). The forest products industry is "extremely important"to many local economies in the Northern California "timber counties," generating about 13 percent of the personal income and 16 percent of the jobs.[222]

27. In Sonoma and Mendocino counties, vineyard development has a significant influence on agricultural land and, in some coastal areas, on forestland. The cool coastal hills in Sonoma and southern/central Mendocino are currently in high demand for vineyard conversion.

28. In the past ten years, dairies have declined in numbers; however, production levels have remained relatively steady. High land values and development pressure from expanding urban and suburban growth—especially in Sonoma and Marin counties—make it increasingly difficult for family farmers to keep their lands in agricultural use.

29. Tourism is an increasingly important driver in the North Coast regional economy. In local coastal communities in the North Coast, many residents and business-owners look to tourism as a growing source of jobs and local revenues to offset the declines in fishing and timber economies. Tourism jobs can be especially important in small communities, such as coastal towns and rural areas, where employment opportunities can be scarce. Many of these jobs, however, are seasonal and may pay relatively low wages, creating a low-income service-worker population in areas where housing costs are high.

Conservation Capacity

30. There are a number of local conservation organizations. Their capacity to implement conservation strategies is mixed. Some have a long history of taking effective action to achieve meaningful conservation goals. Examples include the Marin Agricultural Land Trust, the Inter-Tribal Sinkyone Wilderness Council, and the Mattole Restoration Council and its affiliated groups. Other groups, such as the Redwood Forest Foundation, Inc. and the Buckeye Conservancy, and collaborative efforts such as the Northcoast Regional Land Trust, have formed more recently but may prove to be effective conservation organizations in their own right as their programs mature.

2. Conclusions Informing Development of Conservation Strategies

1. With the possible exception of Marin County (which has a substantial base of protected public land, an effective local land trust, and stable land use policies), the threats to coastal resources are generally[223] highest in the southern part of the region and lowest in the north, due to:
   - lack of strong land use policies limiting development of coastal resources;
   - predominance of land in private ownership;
   - relative proximity to urban populations demanding primary and secondary residences; and
   - milder coastal climate conducive to second home and vineyard development.
2. Until recently, the economic viability of the resource-based economy has sustained landowners' willingness to assemble and maintain large landholdings, in order to provide economies of scale for their forestry, ranching and farming operations (see land ownership portion of Synthesis Map, Figure 8).
3. Population growth, high urban land values, regulation, and global competition in the commodities markets are putting increasing pressure on traditional resource-based land uses, making land use conversion increasingly likely as landowners look for more profitable uses of their land.
4. The pattern of large land ownerships, mostly timber companies and some cattle ranches in the northern portion of the region, presents an extraordinary opportunity to protect very large tracts before fragmentation increases the price and complexity of achieving landscape-scale conservation.
5. The public and governmental policy interests in coastal protection and access, fisheries restoration, and water quality provide a strong base for developing considerable political and financial support for protecting coastal resources.
6. Various factors favor a "working landscape" approach to conservation in much of the region. These factors include:

- inadequate funding for management of public land;
- political resistance to taking land out of production and off the tax rolls;
- private ownership, either by "for-profit" owners subject to conservation easements or non-profit owners, that may present lower-cost means of providing stewardship of conservation lands.

7. The extraordinary beauty of the region, the abundant recreational opportunities (fishing, camping, diving), and other attractions (art, wine-tasting, quaint bed-and-breakfasts) provide the foundation for a burgeoning tourist industry. Protecting the coastal resources that attract these visitors will have significant economic benefits.

Part 3C:
Regional Conservation Strategies

Overview

Several factors have kept urbanization largely at bay on the North Coast. These factors include the rugged topography, with few, invariably winding roads to the coast; the Coastal Act, which arrived in time to secure much of the region from the kind of intensive development found elsewhere on the coast; and until recently, the economic viability of forestry, fisheries and agriculture.

However, changes of uncommon consequence are now besetting the region. In particular, the legacy of intensive management of the forest resource (and the ensuing restrictive regulation of water quality, timber management and habitat), together with increased global competition and commoditization of forest and farm products, have converged to depress returns on many resource-based land uses. At the same time, California's burgeoning population, the increasing affluence of Bay Area residents and the associated increasing demand for residential use of rural land, and even the internet (which enables telecommuters to locate in rural areas), are changing the demographics and economics of land use in the region.

Consequently, this is a critical time for the North Coast, fraught with the possibility that its vast forested landscapes, coastal wetlands and grasslands, which have long stood as icons for the grandeur and abundance of coastal California, will be compromised, piece by piece, by conversion to hobby ranches and rural retreats for affluent urban émigrés. Yet it is also a time that presents an unprecedented opportunity to arrest this imminent fragmentation of ownerships and secure a sustainable financial and ecological future for these treasured landscapes. While the time to act is short, and the challenges inherent in securing funding and defining a sustainable future for these coastal resources loom large, the potential is enormous, and success is surprisingly within reach.

Note:

All of the "HU Summaries" presented in Part 2 include General and Site-Specific Action Recommendations for their respective areas. The reader should consult those summaries for a detailed list of specific conservation actions in each of those hydrologic units. The purpose of this Section 3Cis to present recommendations for regional conservation strategies which, based on our review of the HU Summaries and the political, economic and social conditions highlighted above, may most effectively conserve the high-priority coastal resources in the region. Of course, many of the specific recommendations in the HU Summaries will fit under one or more of the strategic themes presented below.

Conservation Goals and Strategies

Goal 1

Move quickly to establish "working landscape" conservation management on large, strategically located forest and agricultural properties in resource rich watersheds in Humboldt, Mendocino, and Del Norte counties.

Unlike most of California, where land conservation requires reassembling fragmented landscapes through time-consuming and expensive acquisition of small tracts, the assemblage has already been done in these North Coast counties by timber and agricultural landowners who have consolidated many smaller properties in pursuit of economies of scale for their operations. On the Mendocino County coast, for example, two large industrial forestland owners (Hawthorne Timber Company and the Mendocino Redwood Company) control more than 400,000 acres of important coastal watersheds. Similar patterns can be found in Humboldt and Del Norte counties.

These watersheds are high priorities for at least two state resource agencies. For example, DFG's Recovery Strategy identifies many of these coastal watersheds as high priorities for coho salmon protection and recovery. In fact, the Recovery Strategy specifically recommends "Encourag[ing] continued economically sustainable management of forest and agricultural lands in the range of coho salmon to reduce the potential for conversion to residential or commercial development."[224]

In addition, water quality goals have been established by the U.S. EPA and the North Coast Regional Water Quality Control Board for most of the coastal watersheds in the region. The Regional Board's *Nonpoint Source Program Strategy and Implementation Plan, 1998—2013* identifies several management measures related to silvicultural and agricultural activities that can enhance water quality.[225]

The traditional approach of public acquisition and preservation of forestlands cannot alone meet this challenge: there is not nearly enough public money to purchase or manage such large tracts of forestland. Further, local communities are increasingly resistant to the effects of such large purchases on the local economy and tax base. However, because these large forest properties are uniquely productive, they can continue to generate substantial income from ongoing sustainable timber management. While the rates of return probably will not compete with other investments available to the for-profit sector (including subdivision), they should be adequate to repay loans made to non-profit organizations for acquisition of these lands and to cover the costs of management and restoration necessary to achieve the desired enhancement of coastal resources.[226]
It is important to note that size alone is not a sufficient criterion for selecting projects pursuant to this strategy. Rather, the intent is to focus on those properties which:

- are large enough to stabilize land use in the region by having a substantial positive effect on the viability of sustainable, resource-based economic activities on surrounding lands;
- are located where they provide a bulwark against the spread of incompatible land uses;

- provide opportunities for large-scale protection and restoration of high- priority aquatic and terrestrial resources (such as coho salmon refugia);
- provide a landscape connection to other important conservation lands; and
- are themselves large enough to be economically self-sufficient.

Generally speaking, properties must be quite large (in excess of 10,000 acres, perhaps larger, depending on location) to meet the criteria recommended for application of this strategy. Smaller properties should meet the criteria presented in GOAL 2, below.

Goal 1 – Strategies

- Fund non-profit acquisition, ownership and management of working forests and agricultural lands on large, productive, and ecologically important forest and agricultural lands.
- Fund acquisition of "working landscape" conservation easements on large, productive, and ecologically important forests and agricultural lands.
- Develop public and private philanthropic loan programs, like the State Revolving Fund, that provide long-term, low interest loans to non-profit and private landowners to establish and maintain working landscape projects.[227]
- Develop long-term ownership and governance mechanisms to ensure stable oversight and management of these large ownerships. Consider developing local councils or other representative entities to assume these responsibilities over time.

Goal 1 – Examples

Garcia River Forest

In February of 2004, The Conservation Fund, in partnership with the Coastal Conservancy, the Wildlife Conservation Board, and TNC purchased the Garcia River Forest located in Mendocino County just north of the Sonoma County border. At closing, TNC acquired a "working forest" conservation easement that prohibits subdivision or other conversion, requires establishment of a reserve on at least 35 percent of the property, and allows certified timber harvesting. The purpose of the acquisition is to eliminate the threat of fragmentation of this important coastal property and demonstrate that sustainable forest management practices and ecological restoration of impaired watersheds and salmonid habitat restoration can be economically feasible and beneficial to local communities. Results so far have been very positive, and the project has been recognized as an innovative response to the daunting challenge of forest fragmentation and watershed protection.[228]

Six Rivers to the Sea (SRS)

SRS is a regional conservation initiative that seeks to protect functional landscapes vital to preserving the ecology, culture, and economy of the area between Six Rivers National Forest and the Pacific Ocean in Humboldt, Del Norte and Trinity counties. Approximately 1,000 square miles

are targeted, comprising multiple properties managed primarily for natural resource production and associated values.

SRS provides a mechanism for implementing key strategies identified in DFG's *Strategic Plan* and *Steelhead Recovery Plan, Recovery Strategy for California Coho Salmon, The North Coast Watershed Assessment Plan,* and the *Van Duzen River Plan.* SRS also manifests strategies developed by diverse stakeholders during two significant North Coast conservation planning processes: 1) the California Legacy Project (sponsored by the Resources Agency in 2003); and 2) the 2004 Efroymson workshops (co-sponsored by TNC, Save-the-Redwoods League, and the Northcoast Regional Land Trust).

To date, SRS has acquired five conservation easement tracts totaling over 17,000 acres in Humboldt County. These conservation easements are designed to promote older forests, preserve riparian areas (including wild salmon and steelhead habitat), protect oak woodlands, and prevent subdivision and development. The SRS conservation model emphasizes economic sustainability and ecological health as the key building blocks of a strategic, landscape-scale conservation strategy that can be effectively implemented across private non-industrial ownerships of the region in the coming decades.

The SRS initiative has received broad support from a diverse array of partners, including key local landowners, the California Department of Fish and Game, the Coastal Conservancy, the County of Humboldt, the Northcoast Regional Land Trust, TNC, and the state and federal Forest Legacy Programs (FLP). SRS has been ranked California's number one easement project two years running.

Goal 1 – Opportunities

Willits Woods Working Forest Conservation Easement Acquisition

The Conservation Fund has signed a letter of intent to acquire a working forest conservation easement on approximately 18,000 acres of forestland in the upper watershed of Big River known as "Willits Woods." This property has dozens of certificates of compliance, and its proximity to Willits makes it vulnerable to subdivision.

Hawthorne Timber Company Fee / Easement acquisition

See detailed project description in Section 3D, below.

Goal 2

Focus other fee or easement acquisitions on unique resources that are essential to conserving high-priority coastal resources, such as remaining old-growth redwood forest stands, coastal estuaries and floodplains within important coho salmon refugia watersheds, and California Coastal Trail segments.

Virtually every coastal parcel, large or small, has some kind of coastal amenity that, in isolation, may seem worthy of protection. Some may be part of a neighborhood or transit corridor viewshed, others may provide coastal access. However, given the limitless number of coastal parcels, it is essential to have some basis for selecting among the myriad conservation opportunities. Based

upon a review of the HU summaries, viable stands of old-growth and mature second-growth redwood forests, coastal floodplains and estuaries in watersheds that are high priority for coho salmon, and California Coastal Trail segments seem to warrant particular attention.[229]

The region's coastal floodplains and estuaries are biologically and agriculturally very rich. Biologically, they provide critical habitat for Pacific salmon, including coho salmon. Adults use the estuaries as holding areas before continuing upstream to spawn. Juveniles also occupy estuaries for several weeks before migrating to out to sea.[230] Some experts have characterized estuaries as the "bottleneck" for coho salmon recovery.[231] These estuarine properties and floodplains are also critical foraging habitat for migratory waterfowl and other wildlife species.

The coastal floodplains and associated uplands also have unique agricultural values. The rich bottomlands, mild temperatures, and abundant rainfall of these coastal areas support year-round grasslands for grazing, and the region's coastal floodplains and associated uplands continue to support productive dairy and other farming operations. While dairies have declined in numbers, production levels have remained relatively steady throughout the region. As with timber harvesting, there are environmental impacts associated with farming and dairying in sensitive wetland and coastal areas, but properly managed agricultural activities can be a sustainable and complementary land use.

Goal 2 – Strategies

- Identify high-priority estuaries and floodplains based on watershed integrity and feasibility of restoration of important coastal resources such as coho salmon.
- Develop detailed conservation and enhancement plans for high- priority estuaries and floodplains like the Smith River Delta, Redwood Creek, Garcia River and Big River, identifying critical parcels to be protected through acquisition of fee or easement interests.[232]
- Partner with local, regional or national land conservation organizations, including qualified stakeholder groups, to pursue acquisitions and management of critical parcels and to implement restoration projects identified in the enhancement plans.
- Develop projects that demonstrate best management and restoration practices for agricultural uses in coastal floodplains.
- Acquire in fee unique and sensitive coastal resources, such as viable old-growth and second-growth redwood forest stands, coastal wetlands, and California Coastal Trail segments, where public or non-profit preservation is required to adequately protect the resource.
- Secure protection for existing parks and reserves through strategic use of fee or easement acquisitions of property that complements existing protected lands.

Goal 2 – Strategies – Examples

Stornetta Ranch Acquisition

Under the leadership of the Coastal Conservancy, the Wildlife Conservation Board, TNC and the Bureau of Land Management, the 1,711 acre Stornetta Ranch was protected through a model acquisition of fee and easement interests that protect the property's ecological, agricultural and public access values.

In the 1990's, the Coastal Conservancy funded a watershed enhancement plan for the lower Garcia River. The enhancement plan provided the basis for focusing acquisition efforts on the Stornetta Ranch. The area was also identified in PCJV's Strategic Plan as requiring protection.

The property's prominent natural features include the estuary, mouth, and a two-mile stretch of the Garcia River; sandy beaches and dunes; over two and one-half miles of Pacific Ocean coastline and wetlands; riparian areas; and grasslands. The area provides important habitat in the Pacific Flyway for several migratory bird species, including tundra (whistling) swans, and the river supports spawning runs of steelhead.

Stornetta Ranch and Lower Garcia River *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Lower Big River Acquisition

A long-term community effort was brought to fruition in 2002 by MLT and Trust for Wildland Communities with the $25.7 million acquisition and transfer to DPR of 7,334 acres of the lower Big River estuary and adjacent forestland in Mendocino County. Over 20 conservation organizations, a dozen state and federal agencies, 17 private foundations, over 70 local businesses and civic groups, and over 1,400 individual donors from 25 states plus Canada collaborated on an intensive

16-month campaign to raise the funds. The breadth of support reflect the outstanding natural, scenic, recreational, and educational resource values of the project: it was described by the Coastal Conservancy as a "poster project," and its permanent protection was called for by agencies including DFG, the USFWS, U.S. Department of the Interior, the State Coastal Commission, and a dozen public and private conservation organizations.

Natural features of the property include 1,500 acres of wetlands; the 8.3-mile long estuary; 27 endangered, threatened, or species of concern; over 60,000 acres of connected wildlife habitat between the property and adjacent public land; and over 50 miles of joined hiking trails.

Mill Creek Property Acquisition and Restoration

In 2002, the Coastal Conservancy, Wildlife Conservation Board, DFG, DPR, and Save-the-Redwoods League joined forces to acquire the 25,000-acre Mill Creek property for addition to Redwood National and State Parks. The watershed was identified by DFG as one of the state's premier wild coho salmon nurseries, and by TNC as one of the key aquatic systems for protection. Not only did the purchase place almost the entire Mill Creek and Rock Creek watershed in protected ownership, its restoration will enhance landscape-scale connections between the coastal parks and the inland forests of the Klamath-Siskiyou bioregion.

In partnership with Save-the-Redwoods League, the Coastal Conservancy developed interim management recommendations to guide management and restoration of the watershed prior to amendment of the State Park General Plan for the property. Priority actions identified include erosion control, forest restoration, enhancement of in-stream and riparian habitat, and providing public access on existing roads.

Goal 2 – Opportunities

Lake Earl, Del Norte County

The Coastal Conservancy and the Wildlife Conservation Board are co-funding an effort to acquire from willing sellers flood-prone properties along the east shore of Lake Earl. These properties, when acquired through easement or fee-simple title, will provide greater flexibility for lake level management and, thus, additional habitat adjacent to Lake Earl. In some cases, acquired parcels may be eligible for addition to the ecologically important Lake Earl Wildlife Area, currently managed by DFG.

In addition to east-shore Lake Earl efforts, the Coastal Conservancy is meeting with local public and private land managers to develop a series of Aleutian goose management recommendations. These recommendations, when adopted, will provide a means of managing an expanding goose population, consistent with the protection of existing agricultural operations in the Smith River Bottoms. Recommendations will focus on three areas; 1) provision and protection of suitable goose habitat; 2) coordination of goose hazing efforts; and, 3) development of appropriate hunting regulations for the region.

Lake Earl *(Copyright © 2002-2005 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org)*

Redwood Creek, Humboldt County

Until the construction of the Redwood Creek Flood Control Project in 1968, agriculture and a fully functioning estuary coexisted effectively. The construction of the project in 1968 drastically reduced the size and ecological function of the estuary.

For several years the Coastal Conservancy has engaged in discussions with the Park Service, the County of Humboldt, the Army Corps of Engineers, the community of Orick, and others to explore means of restoring the estuary, thereby improving rearing habitat for juvenile salmonids, adult coastal cutthroat trout, migratory waterfowl, and many other species, in a fashion that is consistent with continued agricultural use of the valley floor.

The opportunity to restore this estuary presents one of the greatest enhancement opportunities on the North Coast with respect to restoring salmonid habitat. Although many of the potentially affected landowners have expressed a desire to commence with enhancement efforts, some landowners in potentially affected areas remain noncommittal or partially resistant to proposed enhancement measures. Thus, no enhancement measures have proceeded beyond the planning phase.

In an effort to protect the integrity of current agricultural operations—in the face of increasing development pressure in Humboldt County—and thereby encourage land use practices that do not foreclose the future enhancement of the estuary, the Coastal Conservancy authorized funds to assist with the purchase of the McNamara Dairy. That effort has since been abandoned by the Coastal Conservancy and its partner, the Northcoast Regional Land Trust, due to a decision by the owner not to sell. That owner is now seeking approval for lot line adjustments that will result in the further residential development of his property.

No other opportunities for acquisition are known at this time in the Redwood Creek estuary area. Should any such opportunities arise, they should be considered a high priority for action, and should be devised in such a way that pasture land adjacent to the levee system is governed by easements that will not preclude future enhancement measures, such as levee setbacks, reduction in levee size, or restoring the creek to its historic channel configuration.

Goal 3

Develop and support local programs that are committed to well planned and strategic long-term efforts to protect areas with high coastal resource values.

The complexity and scope of effort needed to achieve meaningful conservation of high-priority resources in the North Coast requires focused, capable conservation organizations equal to the task. While great things have been done in the recent and not-so-recent past by groups like Save-the-Redwoods League (which has worked to establish and build upon the largest state parks in the redwood region), additional partners, and new tools, are needed to keep pace with the changes sweeping the region.

There are important examples of effective local conservation efforts that could be replicated elsewhere in the region. At the same time, there are new players emerging that are exploring different and potentially powerful new strategies. These seasoned and nascent conservation organizations, together with regional, state and national non-profit and public agency partners, should be nurtured and encouraged to carry on, or pick up, the hard work of protecting the region's coastal resources.

Goal 3 – Strategies

- Support effective local conservation groups that have established clear, strategic priorities (e.g., landscape-scale projects) and have developed the effective programs for achieving them.
- Identify and assist with the development of new local organizations that have a clear sense of conservation purpose, enjoy broad local support, and have effective volunteer or paid staff.
- Stimulate focused and sustained conservation efforts in areas with enhancement plans.

Goal 3 – Examples

Marin Agricultural Land Trust

Established in 1980 as the first land trust to focus on protecting agricultural land, the Marin Agricultural Land Trust has acquired agricultural easements on more than 38,000 acres on 57 family farms and ranches, permanently protecting them from nonagricultural development. Keys to success have been: clear priorities (all agriculturally zoned land in west Marin County); strong and consistent county land use policies mandating 60-acre minimum parcel sizes and limiting residential and other development that is not consistent with agricultural land uses; board membership reflecting both agricultural and urban stakeholders in the county; and experienced, talented staff.

Mattole Restoration Council

Founded in 1983, the Mattole Restoration Council is a coalition of community groups, landowners, and individuals in the Mattole River watershed seeking to restore and sustain the healthy functioning of the watershed's natural systems, such as forests, fisheries, soils, flora and fauna. Within 13 years of its inception, dozens of high-priority erosion scars throughout the watershed had been healed and about two-thirds of the small area of remaining old-growth forests had in some way been protected; additionally, there are now more jobs in the valley in restoration than in logging.[233] The Council is known as the first community-based restoration effort in the state of California and remains at the forefront of this trend.

Intertribal Sinkyone Wilderness Council

Founded in 1986, the InterTribal Sinkyone Wilderness Council is an indigenous people's land conservation organization comprised of ten North Coast tribes. The Council is charged with reestablishing California Indian stewardship within the Sinkyone Indian ancestral territory, through traditional resource management including culturally-based land preservation, ecosystem recovery, and a collaborative watershed rehabilitation program. The Council owns and manages the 3,845-acre InterTribal Sinkyone Wilderness, located immediately east of the 7,250-acre Sinkyone Wilderness State Park in northern Mendocino County. The InterTribal Wilderness is the first of its kind in North America.

Goal 3 – Opportunities

The Redwood Forest Foundation, Inc. (RFFI)

RFFI is a private non-profit, Section 501(c)(3) organization established to acquire, protect, restore and manage forestlands for the long-term public benefit of the region's citizens.

RFFI's objective is to create a model "working community forest" by purchasing and sustainably managing redwood forests surrounding communities in the redwood region. RFFI intends its forest management practices to demonstrate respect for the integrity of forest ecosystems, while benefiting the community by providing wildlife habitat, clean water, open space, and jobs. RFFI board membership reflects the diverse interests and stakeholders of the redwood region. Currently they are served by a volunteer executive director. While RFFI is relatively new, it has the potential to be an important part of forest conservation efforts in the redwood region.

The Buckeye Conservancy

The Conservancy is a non-profit organization with over 200 family, individual, and commercial memberships, representing over 300,000 acres of forests and ranchland in Humboldt County. The Conservancy's mission is to promote sound resource management practices and policies that contribute to the ecological health of the region's wildlands, good stewardship of natural resources, and a healthy, stable economy. It also strives to maintain the integrity of the rural landscape by encouraging the continuation of family-owned farms, ranches and forestlands, through enabling intergenerational transfers and minimizing loss of productive land due to sale,

fragmentation or inappropriate development. Recent accomplishments include preparation of recommendations relating to streamlining timber harvest plan approval for smaller landowners. This collaborative approach could be very effective in dealing with the many smaller timberland parcels in the region.

The Northcoast Regional Land Trust (NRLT)

NRLT is a private non-profit organization dedicated to the protection of working lands, family farms, forests, and rangelands, and to the preservation and protection of land for its natural, educational, scenic, and historic values. The organization works with landowners on a voluntary basis to promote stewardship of Northern California's healthy and productive resource base, natural systems, and quality of life. NRLT's programs currently emphasize land protection and regional planning projects that integrate ecological, economic, and community values. NRLT is actively working on conservation easement projects covering over 25,000 acres, and also owns and restores land at select locations. Active planning efforts include a *Farmland Conservation Study* for Humboldt County and a more encompassing *Regional Conservation Plan* for a tri-county region that includes Humboldt, Del Norte, and Trinity counties.

Part 3D:
Conservation Opportunity—Large-scale Working Forest Conservation on the Mendocino Coast

The Conservation Fund, working with the Redwood Forest Foundation, Inc., is developing a project to conserve the 183,000-acre Hawthorne Timber Company holdings in Mendocino County. At present, the parties are discussing a purchase of fee simple interests in all of Hawthorne's holdings in Salmon Creek and Big River, totaling more than 16,300 acres, and a working forest conservation easement on the remaining 165,400 acres in the Usal and Ten Mile watersheds. The prices for these fee and easement interests are estimated to be $45–50 million and $60 million, respectively.

The Salmon Creek and Big River lands to be acquired in fee will be managed as working forest, with timber harvests and other land management prescriptions designed to substantially increase timber volumes, reduce sedimentation, enhance water quality and restore aquatic and terrestrial habitat. Public access also will be provided. The working forest conservation easement on the Usal and Ten Mile tracts will prohibit subdivision, prohibit conversion to non-forest uses, protect remaining old growth trees, provide for buffers on Class III streams, and limit harvest to levels substantially less than growth.

This project presents an unprecedented opportunity to prevent forest subdivision, enhance water quality, fisheries and wildlife habitat, and preserve local jobs in more than seven high-priority watersheds in one of the most vulnerable parts of the North Coast. Much as the 20th-century establishment of the redwood parks marked a stunning and historic advance in protecting the region's most unique and productive natural features, the Hawthorne transaction will protect a vast array of public benefits for generations to come.

Success will also establish a model for innovative and cost-effective forest conservation throughout the region and beyond, at a scale never before seen in the western United States. The attributes of the property and the public benefits that will be attained upon completion of the project are summarized below.

Public Benefits Attained

Extraordinary Landscape Connectivity

Property provides landscape connectivity between to important existing public lands, including:

- Jackson Demonstration State Forest
- Big River Unit of Mendocino Headlands State Park
- Mendocino Woodlands State Park
- Sinkyone Wilderness State Park

- Admiral Standley State Recreation Area.

Fulfillment of High-priority Coho Salmon Conservation Goals

Permanent conservation and eventual restoration of high-priority aquatic habitat for coho salmon and steelhead,[234] including the following high-priority recovery units and watersheds identified in the Recovery Strategy for the Southern Oregon and Northern California and California Central Coast Coho Salmon ESU:

- South Fork Eel River—Benbow (5/5) [235]
- South Fork Eel River—Laytonville (5/5)
- Big River (4/5)
- Noyo River (4/5)
- Ten Mile River (4/5)
- Wages Creek (4/5)
- Usal Creek (4/5)

Advances Water Quality Objectives

Implement management measures for sediment reduction identified in the *Nonpoint Source Program Strategy and Implementation Plan, 1998–2013* (NPS Implementation Plan), adopted by the North Coast Regional Water Quality Control Board, and in U.S. Environmental Protection Agency TMDLs for the following impaired water bodies:[236]

- Albion River
- Big River
- South Fork Eel River
- Noyo River
- Ten Mile River

Community Stability

Ensure future economic productivity of some of California's most valuable timber resources:[237]

- The largest areas of privately owned forests in the state are in Humboldt and Mendocino counties.
- Half of California's annual timber revenue comes from Mendocino and Humboldt counties (the value of redwood harvest in 2000 was $390 million, 43 percent of the total value for the state).

- The forest products industry is "extremely important " to many local economies in the Northern California "timber counties," generating about 13 percent of the personal income and 16 percent of the jobs.[238]

Expands Innovative Funding Sources for Forest Conservation Such as the State Revolving Fund

The Conservation Fund has submitted to the Regional Water Quality Control Board a request for a $60 million loan from the State Revolving Fund to establish a model forest, fisheries and watershed project, to protect and enhance beneficial uses by improving water quality through acquisition and management of fee title or conservation easements on productive forestland within one or more impaired water bodies in the North Coast region. These SRF funds will be combined with other funds to achieve a variety of water quality protection and enhancement goals identified in the *Nonpoint Source Program Strategy and Implementation Plan, 1998–2013* and the *Strategy for Implementing State Revolving Fund for Expanding Use Projects,* particularly with regard to sediments.

Precedent-setting Public/Private Partnership

Provides a stunning example of a public/private partnership that could provide a model for the region. Benefits include:

- reducing the cost of land conservation by emphasizing public/private partnerships that keep land in private ownership;
- reducing socioeconomic impacts of conservation by allowing continued compatible economic uses of resource lands, to maintain economic vitality of rural communities; and
- keeping land on the property tax rolls.

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Appendix 1:
Catalogue of North Coast Conservation Plans

North Coast Planning Resource	Organization	Description	Web Addresses
International-Statewide Planning Resources			
North American Waterfowl Management Plan (1986) *Update to the North American Waterfowl Management Plan, Expanding the Vision (1998)*	U.S. Fish and Wildlife; SEMANARP (Mexican Department of the Environment); Environment Canada, Canadian Wildlife Service	The North American Waterfowl Management Plan (NAWMP) is an international action plan to conserve migratory birds throughout the continent. The Plan's goal is to return waterfowl populations to their 1970s levels by conserving wetland and upland habitat. The Plan was adopted in 1986 and updated in 1998. It utilizes special partnerships called Joint Ventures to manage waterfowl populations in North America.	www.nawmp.ca www.nawmp.ca/eng/part_e.html
The North American Bird Conservation Initiative in the United States – A Vision of American Bird Conservation	North American Bird Conservation Initiative (NABCI)	Created in 1998, NABCI's goal is to enhance, protect and restore North American Bird Habitat through coordinating a North American strategy among agencies. It works through regionally-based, biologically-driven, landscape-oriented partnerships. It currently has established regional Bird Conservation Regions, but has yet not completed a great deal of distinct planning efforts for California. The Vision describes current major NABCI policy objectives and the status and coordination of other major North American bird conservation initiatives.	www.nabci-us.org www.dodpif.org/nabci/us/vision.htm
Waterbird Conservation for the Americas: The North American Waterbird Conservation Plan, Version 1.	Waterbird Conservation for the Americas	An overarching continental framework and guide for conserving waterbirds. It sets forth goals and priorities for waterbirds in all habitats from the Canadian Arctic to Panama, from Bermuda through the U.S. Pacific Islands, at nesting sites, during annual migrations, and during nonbreeding periods. Version 1 focuses on seabirds and colonial-nesting waterbirds. Also working on regional plans, including one for the pacific coast (also at NAWCA.org, the website for the North American Wetlands Conservation Act), which identify priority waterbird species for each BCR.	www.waterbirdconservation.org/pubs/ContinentalPlan.cfm www.waterbirdconservation.org/regional/

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
International	North America	1986; 1998	MB	none	none	NAWMP Implementation Office Wildlife Conservation Branch Canadian Wildlife Service Environment Canada Place Vincent Massey, 3rd Floor 351 St. Joseph Boulevard Hull, Quebec Canada, K1A 0H3 (819) 997-1841 nawmp@ec.gc.ca
International	North America		MB	included (Bird Conservation Region ecoregional delineations only)	none	Debbie Hahn, U.S. NABCI Coordinator International Association of Fish & Wildlife Agencies 444 N. Capitol Street, Suite 544 Washington, DC 20001 dhahn@iafwa.org
International	North America		MB	none	none	Nanette Seto U.S. Fish & Wildlife Service Region 1 1911 NE 11th Avenue Portland, OR 97232 (503) 231-6164 Nanette_Seto@fws.gov

North Coast Planning Resource	Organization	Description	Web Addresses
U.S. Shorebird Conservation Plan	U.S. Fish and Wildlife Service (USFWS)	A national strategy for shorebird protection, the Shorebird Conservation Plan is made up of regional plans. The Southern Pacific Shorebird Conservation Plan (which covers the northern California coast) was completed by the Point Reyes Bird Observatory in 2003.	http://shorebirdplan.fws.gov http://shorebirdplan.fws.gov/RegionalShorebird/RegionalPlans.htm
Bird Conservation Plans	California Partners in Flight	Statewide effort connected to broader Partners in Flight conservation planning. Includes a statewide series of bird conservation plans patterned to specific habitats, as well as a GIS monitoring station database.	www.prbo.org/calpif
California Coastal Access Guide	California State Coastal Commission	Comprehensive catalog identifying and describing all public coastal access points along the California Coast. A joint coastal access project of the Coastal Commission and California State Coastal Conservancy, it includes maps, descriptions, and lists of amenities for each access.	www.coastal.ca.gov/access/accessguide.html
California Coastal Atlas	California State Coastal Conservancy	Statewide atlas identifying priority watershed and primary interest areas for Coastal Conservancy actions along the coast.	www.coastalconservancy.ca.gov/Maps/coastalatlas/caindex.pdf
California Forest Legacy Program Assessment of Need *Amendment to California Forest Legacy Program Assessment of Need*	California Dept. of Forestry and Fire Protection	Identifies state priorities for private forest conservation according to national Forest Legacy program guidelines; Pacific Meridian Resources participated in research/GIS. Includes a county by county assessment of needs in private forest lands conservation.	www.fire.ca.gov/ResourceManagement/pdf/AONFinal_CoverPg.pdf www.fire.ca.gov/ResourceManagement/pdf/AONSept.pdf

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
National	United States	2001; North Coast plan 2004	MB	none	SP	U.S. Fish & Wildlife Service shorebirdplan@fws.gov *For the Southern Pacific Plan:* Catherinie Hickey Wetlands Ecology Division PRBO Conservation Science 4990 Shoreline Highway Stinson Beach, CA 94970 chickey@prbo.org
Statewide	California	Ongoing	MB, TB, RH, HL	included	RA	Kim Kreitinger California Partners In Flight Coordinator PRBO Conservation Science 4990 Shoreline Highway Stinson Beach, CA 94970 (415) 868-0655 ext.320 kkreitinger@prbo.org
Statewide	California		PA	none	RA	California Coastal Commission 45 Fremont Street, Suite 2000 San Francisco, CA 94105 (415) 904-5200
Statewide	California	Ongoing	AG, CR, CW, HA, MB, PA, TB	included	RA, in form of identified interest areas	Mark Beyeler California State Coastal Conservancy 1330 Broadway, 11th Floor Oakland, CA 94612 (510) 286-1015
Statewide	California	1995; 2000	FO, AG, LU, OS	included	RA	California Department of Forestry and Fire Protection 1416 Ninth Street, Room 1540 Sacramento, California 95814 (916)653-9450 www.fire.ca.gov

North Coast Planning Resource	Organization	Description	Web Addresses
California Legacy Project	California Legacy Project, California State Resources Agency	A former initiative of the State Resources Agency devoted to providing a consistent statewide strategy towards conservation planning and implementation. California Legacy developed and implemented the California Digital Conservation Atlas; produced "First Draft Report on the Methodology to Identify State Conservation Priorities" (2001) as well as the "Strategic Conservation Investments: Revised Methodology" (2002); and hosted a Statewide series of "Spotlight on Conservation" Regional Workshops, including a report for the North Coast (see below).	www.legacy.ca.gov
California Rivers Assessment - Professional Judgment Assessment	California Resources Agency; California Wildlife Conservation Board	The purpose of CARA is to develop an information system that can provide a comprehensive inventory and evaluation of California's river resources and to make this information easily accessible to decision-makers and the general public. An online rivers database that includes GIS information as well as results of a professional judgment assessment were completed in 1998. The assessment ranks river stretches in terms of resource condition, either: Outstanding, Substantial, Limited, or Moderate.	www.ice.ucdavis.edu/new-cara
California Wild Heritage Campaign; California's Last Wild Places	California Wilderness Coalition	Wild Places is an initiative seeking to identify potential wilderness areas on public lands; it grew out of a 4 year citizen inventory released in 2001 entitled "California's Last Wild Places."	www.calwild.org/places/index.php www.calwild.org/resources/inventory.php
Completing the California Coastal Trail	California State Coastal Conservancy	Plan prioritizing California State Coastal Conservancy coastal trail priorities and laying out missing trail alignments for future acquisition for completion of a 1,300 mile trail along the length of the California coastline. Includes county-by-county estimates of trail miles needed and costs for completion as well as details on proposed trail alignment.	http://californiacoastal-trail.info/cms/pages/trail/done.html
Comprehensive Conservation Plans	U.S. Fish and Wildlife Service	Website organizes plans by region; also has links to endangered species recovery; migratory bird and refuge info. Does not currently include comprehensive conservation plans for the north coast refuges (Humboldt Bay and Castle Rock). Includes species recovery plan for marbled murrelet.	http://library.fws.gov/ccps_region.htm

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Statewide	California		TB, AB, AG, FO, OS, PA, CW	included	RA	Resources Agency 1416 Ninth Street, Suite 1311 Sacramento, CA 95814 (916) 653-5656
Statewide	California		RH, WQ	included	RA	Karen Beardsley, GIS Coordinator California Rivers Assessment Division of Environmental Studies University of California, Davis Davis, California 95616 (916) 752-0532 kbeardsley@ucdavis.edu
Statewide	California	2004; original assessment 2001	TB, AB, HL			California Wilderness Coalition 1212 Broadway, Suite 1700 Oakland, CA 94612 (510) 451-1450 info@calwild.org
Statewide	California		PA	included	SP	California State Coastal Conservancy 1330 Broadway, 11th Floor Oakland, CA 94612 (510) 286-1015
Statewide	California	Ongoing	AB, TB, RH, MB			USFWS Pacific Region 1911 NE 11th Avenue Portland, OR 97232 (503) 231-6120

North Coast Planning Resource	Organization	Description	Web Addresses
Fish and Wildlife Service Planning	U.S. Fish and Wildlife Service (USFWS)	USFWS pursues a host of conservation planning: overall Strategic Plan, Comprehensive Conservation Plans (for refuges); Endangered Species Habitat Conservation Plans; Endangered Species Recovery Plans; the ECOS system (see data/information resources below).	http://planning.fws.gov
Inventory of Barriers to Fish Passage in California's Coastal Watersheds	California State Coastal Conservancy	Statewide assessment of over 15,000 potential barriers to fish passage in coastal watersheds, involving identification and cataloging of 1400 passage barriers, 551 of which are located in the North Coast. The Passage Assessment Database accompanying the report includes detailed information on barrier location and type, and is in ongoing development.	www.calfish.org/Desktop-Default.aspx?tabId=69
Missing Linkages: Restoring Connectivity to the California Landscape	California Wilderness Coalition (CWC), The Nature Conservancy (TNC)	Report resulting from a conference put on by CWC, TNC, USGS, the Center for Reproduction of Endangered Species, and California Department of Parks and Recreation to identify crucial habitat linkages throughout California. Utilized professional judgment assessments to compile high, medium and low priority habitat linkages statewide.	www.calwild.org/resources/pubs/linkages/index.htm
Recovery Strategy for California Coho Salmon	California Department of Fish and Game (CA DFG)	Assessment of the genetic diversity, ecology, and current habitat condition of coho salmon throughout its range. Includes analysis of its occurrence, threat of extinction, and management and restoration potential, as well as basin-by-basin management recommendations.	www.dfg.ca.gov/nafwb/CohoRecovery/RecoveryStrategy.html
The Changing California: Forest and Range 2003 Assessment	California Dept. of Forestry and Fire Protection	Periodic assessment providing a systematic overview of the status, trends and challenges to California's forests and rangelands. The report includes a comprehensive inventory centered around seven bio-indicators: biological diversity, productive capacity, forest health, soil conservation and water quality, forests and climate change, socio-economic benefits, and governance. Also includes a series of 30 on-line technical reports.	www.frap.cdf.ca.gov/assessment2003/index.html

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Statewide	California	Ongoing	AB, TB, RH, MB	included		USFWS Pacific Region 1911 NE 11th Avenue Portland, OR 97232 (503) 231-6120
Statewide	California		AB	included	RA, *some information prioritized (e.g. five counties salmonid conservation program project data)*	Michael Bowen California State Coastal Conservancy 1330 Broadway, 11th Floor Oakland, CA 94612 (510) 286-0720
Statewide	California		HL	included	RA, SP	California Wilderness Coalition 1212 Broadway, Suite 1700 Oakland, CA 94612 (510) 451-1450 info@calwild.org
Statewide	California		AB, RH, WQ	included	RA, SP	Kevin Shaffer Coho Salmon Recovery 830 S Street Sacramento, CA 95814 (916) 327-8840
Statewide	California		FO, AG, LU, AB, TB, RH, HL, RE, WQ	included	RA	Bill Stewart California Department of Forestry and Fire Protection Bill.Stewart@fire.ca.gov

North Coast Planning Resource	Organization	Description	Web Addresses
Regional Planning Resources			
A GIS-Based Model for Assessing Conservation Focal Areas for the Redwood Ecoregion	Conservation Biology Institute; Save-the-Redwoods League	The GIS analysis incorporated into Save-the-Redwoods League's Master Planning process to prioritize watershed units with late-seral, relatively-undisturbed redwood forest throughout the range of redwoods. Also published in 2000 as part of Reed Noss' book, "The Redwood Forest."	www.consbio.org/cbi/applied_research/redwoods/redwoods.htm
Aquatic Habitat Conservation Plan and Candidate Conservation Agreement with Assurances	Green Diamond Resource Company (formerly Simpson Timber); National Marine Fisheries Service	Green Diamond Resource Company (formerly Simpson Timber) is in the process of developing an Aquatic Habitat Conservation Plan that will govern any "take" of aquatic species due to harvesting activities subject to endangered species regulation.	http://swr.nmfs.noaa.gov/simpson.htm
California North Coast Ecoregion Aquatic Conservation Strategy Recommendations	The Nature Conservancy (TNC)	Prioritizes aquatic targets for various North Coast watersheds, assesses levels of threat for target species, and proposes implementation steps.	
California North Coast Ecoregional Plan	The Nature Conservancy	One of TNC's 'ecoregional' plans designed to identify a 'portfolio' of conservation areas that, with proper management, will ensure the long-term persistence of the ecoregion's biological diversity, including: native aquatic and terrestrial systems, rare and common species, and the ecological processes needed to maintain them.	http://conserveonline.org/docs/2002/07/North-Coast_ERP.pdf

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Regional	North Coast, Central Coast		OG, FL, HL	included	SP	Ruskin Hartley Save-the-Redwoods League 114 Sansome Street, Room 1200 San Francisco, CA 94104 (415) 362-2352 Jim Strittholt and Reed Noss Conservation Biology Institute 260 SW Madison Avenue, Suite 106 Corvallis, OR 97333 (541) 757-0687
Regional	North Coast	Draft 2002; Ongoing	AB, FO, HL, TB, WQ, RH		RA	Amedee Brickey Arcata Fish and Wildlife Office U.S. Fish and Wildlife Service 1655 Heindon Road Arcata, CA 95521 (707) 822-7201 James F. Bond National Marine Fisheries Service 1655 Heindon Road Arcata, CA 95521 (707) 825-5176
Regional	North Coast		AB, HL, RH, LU	none	RA, SP	Wendy Millet The Nature Conservancy 201 Mission Street, 4th Floor San Francisco, CA 94105 (415) 777-0487
Regional	North Coast		AB, TB, RH, MB, CW, HL	included	RA, SP	Wendy Millet The Nature Conservancy 201 Mission Street, 4th Floor San Francisco, CA 94105 (415) 777-0487

North Coast Planning Resource	Organization	Description	Web Addresses
California Wildlands Project; North Coast Basin Planning	California Wilderness Coalition	Currently working on a biologically-based North Coast Basin plan identifying core habitats for terrestrial species and linkages between them using LEGACY -- Landscape Connection's GIS-based analysis. Expanding a previous assessment of terrestrial resources to the Klamath basin.	www.calwild.org www.calwild.org/campaigns/cwp.php
Ecological Integrity Assessment of the North Coastal Basin	LEGACY - The Landscape Connection	Long-term GIS project analyzing various aspects of the North Coast's aquatic and forest biodiversity, including mean tree size, road density, carnivore habitat, riparian tree size. Currently being updated.	www.legacy-tlc.org
Habitat Conservation Plans	California Dept. of Fish and Game	Habitat Conservation Plans (HCP) are long-term agreements between an applicant and the U.S. Fish and Wildlife Service. They are designed to offset any harmful effects that a proposed activity might have on federally-listed threatened and endangered species. The HCP process allows development to proceed while providing a conservation basis to conserve the species and provide for incidental take. A "No Surprises" policy provides assurances to landowners participating in HCP efforts. Current HCPs for the North Coast include one for Simpson Timber Company (1992) and for Pacific Lumber Company (1999). Mendocino Redwood Company is in the process of developing one.	www.dfg.ca.gov/hcpb/conplan/fed_hcp/fed_hcp.shtml http://arcata.fws.gov/sect10/hcps.html
National Forest Management Plans	National Forest Service	Forest Management Plans for: Mendocino, Shasta-Trinity, Klamath, Six Rivers National Forests; available online.	www.fs.fed.us/r5

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Regional	North Coast	Ongoing (2004)	TB, AB, LU	included	RA, SP	Cailfornia Wilderness Coalition 1212 Broadway, Suite 1700 Oakland, CA 94612 (510) 451-1450 info@calwild.org
Regional		1998, Ongoing	HL, AB, TB	included	SP	LEGACY - The Landscape Connection P.O. Box 59 Arcata, CA 95518 (707) 826-9408 or (888) 225-7502 jacoby@legacy-tlc.org
Regional	North Coast	1999 (Pacific Lumber); 1992 (Simpson)	FO, AB, HL, TB, WQ, RH		RA	Habitat Conservation Planning Branch 1416 Ninth Street Sacramento, CA 95814 (916) 653-4875
Regional	North Coast		TB, AB, PA, RH, OS, RE, WQ, LU, HL, CR, FO			Pacific Southwest Region 1323 Club Drive Vallejo, CA 94592 (707) 562-8737 www.fs.fed.us/r5/contact/index.shtml

North Coast Planning Resource	Organization	Description	Web Addresses
Natural Community Conservation Planning (NCCP)	California Dept. of Fish and Game	The Natural Community Conservation Planning (NCCP) program of DFG is an unprecedented effort by the State of California, and numerous private and public partners, that takes a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity. An NCCP identifies and provides for the regional or areawide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity. The only completed plans have been done in southern California scrub oak. Mendocino Redwood Company is transforming its landscape approach to sustainable yield timber harvesting into an HCP/NCCP intended to conserve listed and unlisted species and natural communities on its lands - a planning agreement was signed in August 2003. The proposed plan will cover approximately 232,000 acres of private lands within the timber harvest zones of Mendocino and Sonoma Counties that the company currently owns or holds timber rights to.	www.dfg.ca.gov/nccp www.mrc.com/habitat_conservplan.html
Northwest Forest Plan	National Forest Service, U.S. Fish and Wildlife	1994 federal plan establishing standards and guidelines for the management of federal lands within the range of the Northern Spotted Owl.	www.fs.fed.us/r5/nwfp
Pacific Coast Joint Venture Strategic Plan	Pacific Coast Joint Venture	The Pacific Coast Joint Venture (PCJV) is one of thirteen Joint Ventures established under the authority of the North American Wetlands Conservation Act. It brings together public and private agencies, conservation groups, development interests, and others to restore wetlands and wildlife habitat in the coastal areas of Alaska, Hawaii, Oregon, Washington, British Columbia and Northern California. The goal of PCJV is to protect, restore, increase and enhance all types of wetlands, riparian habitat and associated uplands thoughout the Pacific Coast region to benefit birds, fish and other wildlife. The PCJV is the first international joint venture established under the North American Waterfowl Management Plan. In 1993, the PCJV Management Board adopted a draft Strategic Plan, which articulates population and wetland habitat objectives for waterfowl and other migratory wildlife. The Plan will be updated in 2005 and available on the PCJV website.	http://pcjv.org/home.html

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Regional	Northern California		AB, CW, FO, HL, MB, OG, RH, TB, WQ	included		Department of Fish and Game Habitat Conservation Division 1416 Ninth Street, 1208 Sacramento, CA 95814 (916) 653-1070
Regional	California		TB, AB, PA, RH, OS, RE, WQ, LU, HL, CR, FO			Pacific Southwest Region 1323 Club Drive Vallejo, CA 94592 (707) 562-8737 TTY: (707) 562-9130
Regional	Northern California	Draft Strategic Plan Update 2005	CW, MB, RH, TB	none	RA	Ron LeValley, California Coordinator 1497 Central Avenue McKinleyville, CA 95519 (707) 839-0900 ron@madriverbio.com

North Coast Planning Resource	Organization	Description	Web Addresses
Pacific Northwest Conservation Assessment: Northern California Coastal Forests	Conservation Biology Institute	Ecoregional assessment of the North Coast, without a prioritization. Includes information on conservation status, conservation politics, research and planning, conservation biology issues, and conservation opportunities and constraints.	www.consbio.org/cbi/pacnw_assess/er41/setting.htm
Regional Board Water Quality Control Plans (Basin Plans)	State Water Quality Control Board (SWQCB)	The SWQCB has established Basin Plans for each of 9 regions in the State. The North Coast Regional Water Quality Control Board's (NCRWQCB) basin plan provides a definitive program for action designed to preserve and enhance water quality and to protect beneficial uses of water in the North Coast Region. Includes water quality objectives, implementation plans, and policy and monitoring descriptions.	www.waterboards.ca.gov/plnspols www.waterboards.ca.gov/northcoast/programs/basinplan/basin.html
Restoring the Estuary: An Implementation Strategy for the San Francisco Bay Joint Venture *A Strategic Vision for the Restoration of Wetlands and Wildlife in the San Francisco Bay Area*	San Francisco Bay Joint Venture	The San Francisco Bay Joint Venture (SFBJV) is one of fourteen Joint Ventures established under The Migratory Bird Treaty Act and funded under the annual Interior Appropriations act. It brings together public and private agencies, conservation groups, development interests, and others to protect, restore, increase and enhance all types of wetlands, riparian habitat and associated uplands throughout the San Francisco Bay region to benefit birds, fish and other wildlife. This Strategy is based on an ecosystem perspective that considers the biological requirements of wetlands, along with issues of public health and safety. It establishes region-wide habitat goals and subregional objectives for the restoration of the Bay Estuary using three broad categories: bay habitats, seasonal wetlands, and creeks and lakes.	www.sfbayjv.org

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Regional	North Coast		TB, AB, RH, CW, HL	none	RA	Jim Strittholt Conservation Biology Institute 260 SW Madison Avenue, Suite 106 Corvallis, OR 97333 (541) 757-0687
Regional	North Coast	Reviewed 2004	WQ, RH	none		Lauren Clyde North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, CA 95403 (707) 576-2674 LClyde@waterboards.ca.gov Dave Hope North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, CA 95403 (707) 576-2830 DHope@waterboards.ca.gov
Sub-regional	Marin, Sonoma	January 2001	AB, CW, MB, PA, RH, TB, WQ	none		Beth Huning, SFBJV Coordinator 530C Alameda del Prado, #139 Novato, CA 94949 (415) 883-3854 bhuning@sfbayjv.org

North Coast Planning Resource	Organization	Description	Web Addresses
Save-the-Redwoods League Master Plan	Save-the-Redwoods League	Save-the-Redwoods League is using a scientific prioritization process to create specific area plans for a series of focal areas along the range of Coast Redwood (focal areas determined from a focal area model described in Conservation Biology Institute's "A GIS-based Model for Assessing Conservation Focal Areas for the Redwood Ecosystem," 1999).	www.savetheredwoods.org/protecting/masterplan.shtmlwww.savetheredwoods.org/protecting/masterplan.shtml
Southern Pacific Rainforests Physiographic Area Plan	Partners in Flight (PIF)	Regional plan put together as part of PIF's continental effort to ensure long-term maintenance of healthy populations of native landbirds. Plans list priority bird species and habitats per physiographic region. Detailed description at: http://www.partnersinflight.org/pifbcps.htm	www.blm.gov/wildlife/pif-plans.htm
Spotlight on Conservation: North Coast Workshop Interim Report	California Legacy Project	Workshop on regional conservation in the North Coast hosted by the California Legacy Project in May of 2003. Highlighted priority areas for conservation throughout the region, collected information on planning efforts.	www.legacy.ca.gov/workshop_reports.epl
Sub-regional Planning Resources			
A Conservation Vision for the Klamath Basin	The Klamath Basin Coalition	Looking at Siskiyou, Modoc, Humboldt, and the Klamath in Oregon, this plan's purpose is to provide a vision for water, fisheries and wildlife refuge management and restoration as well as to provide a blueprint for achieving that vision. Focused on aquatic biodiversity and working landscapes.	www.klamathbasin.info
A Science-Based Conservation Assessment for the Klamath-Siskiyou Ecoregion: A comprehensive GIS-based conservation assessment and regional plan for a globally outstanding ecoregion of southern Oregon and northern California	Conservation Biology Institute	1999 GIS-based evaluation and reserve design for the Klamath Siskiyou bioregion, using ownership and current protection status, elevation, roadedness, contiguous blocks of roadless areas, concentrations of rare, threatened and endangered species, late seral forest distribution, and fisher habitat suitability.	www.consbio.org/cbi/pubs/reports.htm

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Regional			OG			Ruskin Hartley Save-the-Redwoods League 114 Sansome Street, Room 1200 San Francisco, CA 94104 (415) 362-2352
Regional		Ongoing	MB, TB, HL	included		Carol Beardmore, PIF Western Regional Coordinator cbeardmore@gf.state.az.us
Regional	North Coast		TB, AB, AG, FO, OS, PA, CW		RA	Resources Agency 1416 Ninth Street, Suite 1311 Sacramento, CA 95814 (916) 653-5656
Subregional	Klamath basin		AB, FO, AG			The Klamath Basin Coalition P.O. Box 1375 Eugene, OR 97440 (541) 689-2000 klamathcoalition@aol.com
Subregional	Klamath basin		AB, TB, OG, RH, FO, HL, LU	included	RA, SP	Conservation Biology Institute 260 SW Madison Avenue, Suite 106 Corvallis, OR 97333 (541) 757-0687

North Coast Planning Resource	Organization	Description	Web Addresses
Acquisition Plan 2000: A Blueprint for Agricultural and Open Space Preservation	Sonoma County Agricultural Preservation and Open Space District	Strategic Plan for the county's land conservation district. Used GIS analysis and community and professional input to design a four-way split of resources with separate acquisition strategies: agriculture, natural resources, greenbelts, and recreation. This document provides the guiding vision for the District in pursuing acquisitions.	www.sonomaopenspace.org/resources/docs/acquisition_plan.pdf
Assessment of Aquatic Conditions in the Mendocino Coast Hydrologic Unit	North Coast Regional Water Quality Control Board	2001 North Coast Regional Water Quality Control Board study of aquatic conditions in the Big, Albion, Gualala and Ten Mile Rivers.	www.krisweb.com/biblio/ncc_crwqcb_ncregion_2001_assessmentmhu.pdf
California Native Plant Society - Regional Plan for Mendocino Pygmy Forest	California Native Plant Society	Regional plan of undetermined status to preserve large, contiguous areas of Mendocino Pygmy Forest through land purchase and conservation easements.	
Conservation Planning for Aquatic Biological Integrity in the Klamath-Siskiyou Ecoregion Using Multiple Spatial Scales	Conservation Biology Institute	2001 assessment of multi-decadal forest disturbance in the region. It sought to show how an analysis of the Klamath-Siskiyou region from an aquatics perspective can utilize a multi-scale approach to improve conservation planning and resource management in the region.	www.consbio.org/cbi/pubs/reports.htm
Conserving the Landscapes of Sonoma County	The Nature Conservancy (TNC)	Created for the Sonoma County Action Area prioritized in TNC's North Coast Ecoregional Plan, this plan designates "Priority Conservation Areas" to ensure adequate representation of the county's representative biodiversity.	
Greenbelt Alliance: A Region At Risk	Greenbelt Alliance	Ongoing project to create Development Risk Mapping for the nine Bay Area counties, based on a multifactor analysis of growth potential, zoning, political factors, real estate markets, etc. Data base and mapping work is done in collaboration with GreenInfo Network.	www.greenbelt.org/regions/atrisk_maps/index.html www.greenbelt.org/resources/reports/index.html

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Subregional	Sonoma		AG, OS, TB, AB, LU, HL, RH	included	RA, SP	Sonoma County Agricultural Preservation and Open Space District 747 Mendocino Avenue, Suite 100 Santa Rosa, CA 95401 (707) 565-7360 openspace@sonoma-county.org
Subregional	Mendocino Coast		WQ, AB, RH, HL		RA	North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, CA 95403 (707) 576-2220
Subregional	Mendocino Coast					Lori Hubbart Dorothy King Young Chapter California Native Plant Society P.O. Box 577 Gualala, CA 95445
Subregional	Klamath and Eel Basins		AB, FO, HL, RH, LU	included	RA	Conservation Biology Institute 260 SW Madison Avenue, Suite 106 Corvallis, OR 97333 (541) 757-0687
Subregional	Sonoma		AB, TB, OS, HL	included	RA	Wendy Millet The Nature Conservancy 201 Mission Street, 4th Floor San Francisco, CA 94105 (415) 777-0487
Subregional	Marin and Sonoma		OS, LU, AG, HL, PA	included	SP	Greenbelt Alliance 631 Howard Street, Suite 510 San Francisco, CA 94105 (415) 543-6771 info@greenbelt.org

North Coast Planning Resource	Organization	Description	Web Addresses
Klamath Corridors Proposal, Klamath Biodiveristy Proposal	Klamath Forest Alliance	These related landscape-level plans are based on linking existing protected lands (wilderness, national parks, state parks) with broad watershed corridors and landscape linkages. Involved the Northcoast Environmental Center and Klamath Forest Alliance	www.klamathforestal-liance.org/index.html www.necandeconews.to
Klamath-Siskiyou Private Lands Conservation Assessment: An assessment of regional concentrations of conservation values on private lands in the Klamath-Siskiyou ecoregion	Conservation Biology Institute	November 2002 assessment of regional concentrations of conservation values on private lands in the Klamath-Siskiyou ecoregion. Variables considered included: "key watershed" status, late seral forest, median home value, physical habitat representation, potential prime farmland, sensitive/endangered/threatened species, protected areas, serpentine geology, vegetation representation, forest ownership and management, and stream flow restoration needs.	www.consbio.org/cbi/pubs/reports.htm
Marin Coastal Watershed Enhancement Project	University of California Berkeley Extension	1996 U.C. extension project (with Marin RCD assistance) on west Marin watersheds. The Marin Coastal Watershed Enhancement Project is designed to address the issue of Non-Point Source (NPS) pollution on a local level. Project goals include improving water quality, fish habitat, and natural resources in western Marin County through voluntary adoption of appropriate management practices. The project area encompasses the watersheds of three major coastal streams within Marin County, encompassing approximately 232 sq. miles, or 148,480 acres, primarily in agricultural ownership.	www.sarep.ucdavis.edu/NEWSLTR/v8n3/sa-4.htm
Marin County Watershed Management Plan (Administrative Draft)	Marin County Community Development Agency	A Marin County regional plan setting out to identify criteria and set restoration priorities on a sub-watershed basis, guiding County staff, resource managers, and community organizations on protecting, and where needed restoring, the beauty and natural function of Marin County's watersheds.	www.co.marin.ca.us/depts/CD/main/comdev/Water-shed/WMP_Pt1.pdf

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Subregional	Klamath basin		AB, TB			Klamath Forest Alliance P.O. Box 21 Orleans, CA 95556 (530) 627-3090 klam_watch@yahoo.com
Subregional	Klamath basin		AB, TB, HL, RH	included	RA, SP	Conservation Biology Institute 260 SW Madison Avenue, Suite 106 Corvallis, OR 97333 (541) 757-0687
Subregional	Marin Coast		WQ			Stephanie Larson, Livestock & Range Farm Advisor University of California Cooperative Extension 2604 Ventura Avenue Santa Rosa, CA 95403 (707) 527-2621 lpbf@communique.net
Subregional	Marin Coast		WQ, AB, AG, CW, RH, TB	included		Michele Rodriguez The Marin County Community Development Agency Planning Division 3501 Civic Center Drive, Room 308 San Rafael, CA 94903 (415) 499-6269

North Coast Planning Resource	Organization	Description	Web Addresses
Mendocino County Coastal Conservation Plan	Mendocino Land Trust	A plan developed to identify critical resources of the Mendocino coast, threats to critical resources, priority conservation areas, strategies for resource protection and enhancement, and for public access consistent with the protection of resources. Primary long-term plan goals are to protect and restore, where feasible, natural communities, working landscapes, and scenic viewsheds within Mendocino County's most significant coastal watersheds and coastal terraces, and to enhance public access. Funded by California State Coastal Conservancy.	www.mendocinolandtrust.org www.mendocino-landtrust.org/download/mcccp/MCCCP_v501.pdf
North Coastal California: A Stewardship Report	Save-the-Redwoods League	A workshop-based assessment of regional conservation priorities for coastal areas north of Mendocino, highlighting resource values, community values, opportunities and threats, conservation actions, potential partners and linkages for each of 11 focal areas. Involved the professional judgment of a wide array of non-profit and public agency contributors.	www.savetheredwoods.org/protecting/masterplan.shtml
Prosperity! The North Coast Strategy	Humboldt County Office of Economic Development	Regional development strategy for Humboldt County. Online at: www.northcoastprosperity.com (see "document library"), it includes fisheries and forest products work plans. "Prosperity – The North Coast Strategy" was adopted by the Humboldt County Board of Supervisors as Humboldt County's Comprehensive Economic Development Strategy (CEDS) in 1999. The plan is in the process of an update, so this version should be viewed as a historical, rather than current, document.	www.northcoastprosperity.com www.northcoastprosperity.com/new_economy/newecon.html
Russian River/North Coast Parcel Analysis	Sonoma Land Trust	Detailed analysis of coastal parcels, based on a multiple factors analysis of land use and land cover data, land ownership, sensitive species data, aquatic habitat and wildlife data to prioritize project areas for acquisition. Paired with a previous analysis of the southern Sonoma coast. Completed in 2002.	www.sonomalandtrust.org/rrncpacomp.htm
Six Rivers National Forest Land and Resource Management Plan	National Forest Service	General *Forest Management Plan* for Six Rivers National Forest, also accompanied by the Six Rivers National Forest Fire Plan, and Final Environmental Impact Statement.	www.fs.fed.us/r5/sixrivers/publications/#lrmp

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Subregional	Mendocino Coast		AB, AG, CR, CW, FO, PA, TB, WQ	included	RA	Mendocino Land Trust P.O. Box 1094 Mendocino, CA 95460 (707) 962-0470 info@mendocinolandtrust.org
Subregional	North Mendocino, Humbodlt, Del Norte		AB, AG, CR, CW, FO, HL, LU, MB, OG, OS, PA, RH, RE, TB, WQ	included	RA	Ruskin Hartley Save-the-Redwoods League 114 Sansome Street, Room 1200 San Francisco, CA 94104 (415) 362-2352
Subregional	Humboldt County		RE, LU, OS			Humboldt County Economic Development Forum c/o Redwood Region Economic Development Commission 520 E Street Eureka, CA 95501 (707) 445-9651 info@northcoastprosperity.com www.northcoastprosperity.com
Subregional	Sonoma Coast		AB, TB, OS, AG, HL	included	RA, SP	Sonoma Land Trust 966 Sonoma Avenue Santa Rosa, CA 95404 (707) 526-6930
Subregional	North Coast		FO, PA, AB, TB, RE	none	RA	Six Rivers National Forest 1330 Bayshore Way Eureka, CA 95501 (707) 442-1721

North Coast Planning Resource	Organization	Description	Web Addresses
County General Planning Resources *(See LUPIN for most Plan Documents)*			
Del Norte County General Plan	Del Norte County	Undergoing plan update of old plan (1977); not online; not incorporated into the California Digital Atlas; Local Coastal Plan was updated Dec 1991.	www.co.del-norte.ca.us
Humboldt County General Plan	Humboldt County	Currently updating 1984 general plan. Current plan includes land use, parks and recreation, open space and conservation elements; 6 LCP's dated 1989-1997 will be updated and integrated. Have recent agricultural, forest resource, natural resource and hazard, headwaters alternatives reports; Natural Resource & Hazard report has detailed watershed analysis; generalized plan incorporated into the California Digital Atlas. Includes Humboldt County Trails Plan sub-element.	www.co.humboldt.ca.us/planning/gp www.humboldt.edu/~nvk2/resources/hctp/preface.shtml
Marin County General Plan	Marin County	Last updated 1994, currently undergoing four-year plan update; generalized plan data incorporated into the California Digital Atlas; 2004 Biotic background has wetlands; species and communities from CNDDB. 1986 Local Coastal Plan (LCP) being updated.	www.future-marin.org
Mendocino County General Plan	Mendocino County	Updating plan adopted in 1981 from 2002-2006; Current plan includes recreation, coastal, open space and conservation elements. Still working on a housing element; not incorporated into the California Digital Atlas. LCP being updated as well. Current plan online.	www.co.mendocino.ca.us/planning/index.html www.co.mendocino.ca.us/planning/GenPlan/GPContents.htm
Siskiyou County General Plan	Siskiyou County	Current Plan Elements range from 1973-2003; include land use (1980) and conservation (1973). Generalized plan incorporated into the California Digital Atlas.	www.co.del-norte.ca.us

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Subregional	Del Norte		LU, OS, PA, RE, AG, CR			Del Norte County Community Development Dept. 981 H Street, Suite 110 Crescent City, CA 95531 (707) 464-7254
Subregional	Humboldt		LU, OS, PA, RE, AG, CR	included		Humboldt County Community Development Services Clark Complex 3015 H Street Eureka, CA 95501 (707) 445-7541
Subregional	Marin		LU, OS, PA, RE, AG, CR	included		Marin County Community Planning Division 3501 Civic Center Drive, #308 San Rafael, CA 94903 (415) 499-6269 countywideplan@co.marin.ca.us
Subregional	Mendocino		LU, OS, PA, RE, AG, CR	included		Pamela Townsend and Gary Pedroni, Senior Planners Mendocino County Department of Planning & Building Services 501 Low Gap Road, Room 1440 Ukiah, CA 95482 (707) 463-4281
Subregional	Siskiyou	1973-2003	LU, OS, PA, RE, AG, CR	included		Siskiyou County Planning Department 312 Butte Street P.O. Box 1085 Yreka, CA 96097 (530) 842-8200

North Coast Planning Resource	Organization	Description	Web Addresses
Sonoma County General Plan	Sonoma County	Last updated in 1988 with some revisions in '91 and '94. Includes land use, agricultural resources, open space, and resource conservation elements. Current update being organized thematically, and has added a forestry element. Generalized plan incorporated into the California Digital Atlas. Last LCP 1987.	www.sonoma-county.org/prmd/gp2020/index.html
Trinity County General Plan	Trinity County	Recently updated two elements, though land use (1988), conservation, and open space (1973) have not updated yet. Not incorporated into the California Digital Atlas.	www.trinitycounty.org/Departments/Planning/planning.htm
Watershed Based / Local Planning Resources ***(listed from North to South)***			
Aleutian Goose Wildlife Corridor Management Plan	Humboldt County Resource Conservation District	Species-based plan designed for protection and enhancement of goose habitat extending from Crescent City to the Smith River Delta, in Del Norte County.	
Crescent City Marsh and Wildlife Area Management Plan	California Department of Fish and Game (DFG)	DFG is in the process of management planning to protect the only viable population of endangered western lily and other rare species.	
"Land Laying Outward Place" - Point St. George Management Plan	Prepared for Del Norte County and the California State Coastal Conservancy by the Point Saint George Management Plan Steering Committee	Management plan for 340 acres of coastal terrace situated north of Crescent City, acquired by Del Norte County in 2002. Prepared by the Point Saint George Management Plan Steering Committee with a consultant team lead by Roberts, Kemp and Associates, LLC. Identifies Natural, Cultural, Scenic and Recreational resources and lays out recommendations for their management, with an emphasis on interpretation and protection of natural and cultural resources, wildlife habitat, and provisioning of compatible public access.	http://copia2.copia.net/cgi-bin/Bulletin.mcgi?UF.profile=georgeplan

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Subregional	Sonoma		LU, OS, PA, RE, AG, CR	included		Sonoma County Resource Management Department 2550 Ventura Avenue Santa Rosa, CA 95403 (707) 565-1900
Subregional	Trinity	Various	LU, OS, PA, RE, AG, CR			Trinity County Planning Department 190 Glen Road Building B P.O. Box 2819 Weaverville, CA 96093 (530) 623-1351
Local	Smith River	Ongoing	MB, AG, LU			Humboldt County Resource Conservation District 5630 South Broadway Eureka, CA 95503 (707) 442-6058
Local	Smith River	Ongoing	TB			David K. Imper U.S. Fish and Wildlife Service Arcata Office 1655 Heindon Road Arcata, CA 95521 (707) 822-7201
Local	Smith River		CW, OS, TB, CR, PA	included	RA	County of Del Norte Community Development Department 981 H Street Crescent City, CA 95531 (707) 464-7254

North Coast Planning Resource	Organization	Description	Web Addresses
Lake Earl Wildlife Area Management Plan (Draft)	California Department of Fish and Game	Draft Management Plan (update from 1988) released for public comment in 2003. Includes wildlife and habitat descriptions and management goals for biological elements, public use and facilities. Also prepared Draft Environmental Impact Report.	www.dfg.ca.gov/lewa
Mill Creek Property Interim Management Recommendations	Save-the-Redwoods League	Interim management plan prepared for the 25,000 acre purchase of the Mill Creek property bridging Redwood National and State Parks and Smith River National Recreation Area. Includes road, landslide, erosion, forest management, and public access assessments.	www.savetheredwoods.org/protecting/millcreekIMP.shtml
Pacific Shores Subdivision Analyses	Smith River Alliance	Smith River Alliance, in cooperation with the Coastal Conservancy and the Wildlife Conservation Board, has initiated a program to assess the feasibility of purchasing lots in the Pacific Shores subdivision from willing sellers. Pacific Shores is a 1,535-lot subdivision located next to Lake Earl and Lake Tolowa.	www.smithriveralliance.org/programs/watershed-protect/lakeearl.html
Smith River Anadromous Fish Action Plan	Smith River Advisory Council	Plan to provide monitoring and restoration of the Smith River's anadromous fisheries.	
Forest Management Plan	Hoopa Valley Tribe, Tribal Forestry Department	Multiple use plan for the Hoopa Valley Indian Reservation regarding forest management and harvest practices. The Hoopa Valley Tribe's forestry operations have been certified as Smartwood Certified under FSC guidelines. Tribal forests include 35,000 acres of old-growth forest.	www.hoopa-nsn.gov/departments/forestry/forestry.htm
Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program	Klamath River Basin Fisheries Task Force	1991 Plan undertaken with assistance by William M. Kier associates to guide restoration of native fish/fisheries of the Klamath Basin (in both California and Oregon) with special emphasis on anadromous fish. 1999 mid-term report was produced that includes habitat restoration trends for Klamath subwatersheds; 2004 addendum based on that report lays out updates to management directions.	http://pacific.fws.gov/yreka/tf.htm www.krisweb.com/biblio/gen_usfws_kierassoc_1991_lrp.pdf

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Local	Smith River	2003 - draft	AB, CW, TB, PA, OS, AG, LU	included	RA	CA Department of Fish & Game Eureka Field Office 619 2nd Street Eureka, CA 95501 (707) 445-6493
Local	Smith River		OG, FO, AB, TB, RH, HL, PA	included	RA, SP	Ruskin Hartley Save-the-Redwoods League 114 Sansome Street, Room 1200 San Francisco, CA 94104 (415) 362-2352
Local	Smith River	Ongoing	CW, LU, AB, TB			Grant Werschkull Smith River Alliance P.O. Box 2129 Crescent City, CA 95531 (916) 485-6662
Local	Smith River		AB, RH, HL			Jim Waldvogel Smith River Advisory Council 711 H Street Crescent City, CA 95531 (707) 464-4711 cedelnorte@ucdavis.edu
Local	Klamath	1994; Ongoing	FO			Hoopa Tribal Forestry Department P.O. Box 368 Hoopa, CA 95546 (530) 625-4284
Local	Klamath	1991; 2004	AB, RH, WQ			U.S. Fish and Wildlife Service Yreka Office 1829 South Oregon Street Yreka, CA 96097 (530) 842-5763

North Coast Planning Resource	Organization	Description	Web Addresses
Lower Klamath River Sub-Basin Watershed Restoration Plan	Lower Klamath Restoration Partnership (Yurok Tribe and Simpson Timber Company)	Planning for coordinated salmonid restoration between the Yurok and Simpson Timber; the partnership works to improve stream/riparian habitat, in an "immediate priority" drainage basin (Lower Klamath Fisheries), while training and employing Tribal Members. Seeks to treat the most critical erosional and/or chronic sediment sources in the watershed in the most cost-effective way. Plan outlines training and implementation efforts, prioritized future restoration activities for the sub-basin, and identified tributaries where the activities would be implemented.	
Lower Redwood Creek and Estuary Feasibility Study	California State Coastal Conservancy	Plan to determine action alternative for restoration in the lower Redwood Creek and Estuary. Levee set back study complete; one lower river and estuary feasibility study complete. Provides six alternatives to the current flood control system. Done in collaboration with the Army Corps of Engineers.	
Redwood Creek North Coast Watershed Assessment Program (NCWAP)	California Resources Agency, California EPA	Watershed wide assessment of geologic, hydrologic, water quality, land use and riparian conditions in the Gualala watershed relating to viability for anadromous fish populations. Includes subbasin recommendations, extensive baseline data creation and synthesis, a basin geological report mapping landslide potential and sediment production, analysis of the suitability of stream reaches for salmonid production and refugia. Tests specific hypotheses for each subbasin.	www.ncwatershed.ca.gov
Clam and Moonstone Beach County Parks Recreational Facilities and Resource Management Master Plan	Humboldt County Department of Public Works - Parks Division	Park Management Plan covering from Moonstone Beach six miles south to the Mad River. Addresses the needs for improvements to public facilities and as well as providing natural resource assessment and conservation recommendations. Provides a comprehensive ten-year development plan. Second draft available June 2005 online. Funded by the California State Coastal Conservancy.	www.co.humboldt.ca.us/portal/living/county_parks/default.asp?content=clamMoonstone.htm

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Klamath		AB, FO, WQ			Yurok Tribe 15900 North Highway 101 Klamath, CA 95548 (707) 482-2841
Local	Redwood Creek					Michael Bowen California State Coastal Conservancy 1330 Broadway, 11th Floor Oakland, CA 94612 (510) 286-1015
Local	Redwood Creek		AB, RH, WQ, FO	included	RA;+J102 SP for refugia streams	Russ Henly, Watershed Assessment Manager Fire and Resource Assessment Program California Department of Forestry & Fire Protection 1920 20th Street Sacramento, CA 95814 (916) 227-2659 russ_henly@fire.ca.gov
Local	Mad River	2005; Second Draft	PA, TB, OS, RH	included	RA	Humboldt County Department of Public Works 1106 2nd Street Eureka, CA 95501 (707) 445-7491

North Coast Planning Resource	Organization	Description	Web Addresses
Arcata Community Forest and Jacoby Creek Forest Management Plan	City of Arcata	*Forest Management Plan* and Non-Industrial Timber Management Plan (NTMP) for the City's community forests. Also pursuing various restoration projects, including an open space, recreation and working landscapes plan for an addition to the Arcata Community Forest as well as a Jacoby Creek restoration and buffer.	http://64.163.195.22/ArcataEs/forest.html
City of Eureka - Gulches and Greenways Planning	City of Eureka	Planning work undertaken by the city to address the major issues to be faced in implementing Gulches/ Greenways Management and Preservation Guidelines as noted in the City's General Plan. Developed with community and taskforce input.	
Humboldt Bay Management Plan	Humboldt Bay Harbor, Recreation and Conservation District	A comprehensive strategy to address the need to balance port-related commercial and industrial uses, expanding recreational uses, and environmental protection at Humboldt Bay. Included workshopping in commerce/ industry, agriculture, environment, recreation, education, commercial fishing and mariculture. Report includes Humboldt Bay Water Use Designations, and Harbor, Recreation, and Conservation elements. Partially funded by the Coastal Conservancy.	http://maps.hostgis.com/harbor/con_rec/management_plan.htm
Humboldt Bay Trails Feasibility Study	Prepared for the California State Coastal Conservancy by Redwood Community Action Agency (RCAA)	Trails feasibility study intended to encourage appreciation of Humboldt Bay by increasing environmentally and aesthetically appropriate access opportunities. Collected information about potential access projects, selected and prepared proposals for priority projects. Conducted by RCAA with California State Coastal Conservancy funding.	www.rcaa.org/baytrails
Humboldt Bay Watershed Salmon and Steelhead Conservation Plan	Prepared for the California State Coastal Conservancy and California DFG by Humboldt Bay Watershed Advisory Council and Redwood Community Action Agency	Plan includes comprehensive habitat and biogeographical assessment for Salmon and Steelhead, seeking to improve the effectiveness of salmonid restoration and protection efforts in the Humboldt Bay Watershed. Created as part of the Humboldt Bay Watershed Enhancement Program, a joint program of RCAA's Natural Resources Services and a wide variety of community groups represented through the Humboldt Bay Watershed Advisory Committee (HBWAC).	www.rcaa.org/nrs/proj-curr/bayenhance.htm

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Eureka Plain/ Humboldt Bay	1994; 2002	FO, AB, TB			City of Arcata Environmental Services Department 736 F Street Arcata, CA 95521 (707) 822-8184 eservices@arcatacityhall.org
Local	Eureka Plain/ Humboldt Bay	Ongoing	OS, RH, PA			City of Eureka Community Development Department 531 K Street Eureka CA, 95501 (707) 441-4160
Local	Eureka Plain/ Humboldt Bay	In Draft July 2005	WA, AB, LU, RE, RH, WQ, OG, OS	included	RA	Humboldt Bay Harbor, Recreation and Conservation District 601 Startare Drive P.O. Box 1030 Eureka, CA 95502 (707) 443-0801
Local	Eureka Plain/ Humboldt Bay		PA	included	RA, SP	Natural Resources Services Redwood Community Action Agency 904 G Street Eureka, CA 95570 (707) 269-2066 trails@rcaa.org
Local	Eureka Plain/ Humboldt Bay		AB, WQ, LU	included	RA, SP	Ruth Blyther Natural Resources Services Redwood Community Action Agency 904 G Street Eureka, CA 95570 (707) 269-2066 ruth@rcaa.org

North Coast Planning Resource	Organization	Description	Web Addresses
Humboldt Beach and Dunes Coordinated Resource Management Plan (CRMP)	Prepared for the County of Humboldt and California State Coastal Conservancy	Prepared by Mad River Biologists for the County under contract, the CRMP advocates coordinated management and planning of the entire Beach and Dunes study area, intended to aid in access improvements, acquisition, restoration, law enforcement, development, and other projects in a coordinated and cost-effective manner.	
Humboldt Beach and Dunes Management Plan	Humboldt County	Plan used by county and others as management tool for the beach and dunes area, covering the north and south spits from Clam beach to Centerville beach.	
Indian Island Enhancement Plan	Humboldt Water Resources	Small enhancement plan for an 80-acre Island in Humboldt Bay, focusing on marsh enhancement.	
Manila Dunes Recreation Area Trails Plan	Manila Community Services District	Trails Management Plan and botanical monitoring and management plan for invasive species.	
Martin Slough Enhancement Plan	Prepared by Redwood Community Action Agency for the County of Humboldt and California State Coastal Conservancy	Plan intended to relieve flooding, restore natural functions including salmon migration, as well as increase riparian habitat.	

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Eureka Plain/ Humboldt Bay		CW, PA, AB, TB	included	RA	Sheila Semans California State Coastal Conservancy 1330 Broadway, 11th Floor Oakland, CA 94612 (510) 286-1015
Local	Eureka Plain/ Humboldt Bay		OS, PA, MB, TB	included+I99	RA	Tom Hofweber Humboldt County Community Development Division 3015 H Street Eureka, CA 95501 (707) 445-7541 kgothier@co.humboldt.ca.us
Local	Eureka Plain/ Humboldt Bay		CR, CW			Mike Wilson Humboldt Water Resources P.O. Box 165 Arcata, CA 95518 (707) 826-2869 water@humboldt1.com
Local	Eureka Plain/ Humboldt Bay		PA, TB			Manila Community Services District 1901 Park Street Arcata, CA 95521 (707) 444-3803
Local	Eureka Plain/ Humboldt Bay		CW			Natural Resources Services Redwood Community Action Agency 904 G Street Eureka, CA 95570 (707) 269-2066

North Coast Planning Resource	Organization	Description	Web Addresses
McDaniel Slough Enhancement Plan	City of Arcata Environmental Services Department	Plan to restore saltwater marsh and expand the Arcata Marsh and Wildlife Sanctuary, comprised of 240 acres on the northern part of Arcata Bay.	http://64.163.195.22/ArcataEs/env_svc.html
Total Maximum Daily Loads (TMDLS) for Elk and Freshwater Creek	North Coast Regional Water Quality Control Board, U.S. EPA	A sediment TMDL is in development for the Elk River and Freshwater Creek, scheduled for completion by 2006.	www.swrcb.ca.gov/rwqcb1/programs/tmdl/elkriver/elk.html www.swrcb.ca.gov/rwqcb1/programs/tmdl/freshwatercreek/freshwater.html
Salt River Enhancement Plan	Humboldt County Resource Conservation District (RCD)	Humboldt County RCD is preparing an erosion risk analysis for the Salt River, which will identify major sediment sources in upper watershed, as well as prioritizing future activities. Ongoing.	
Corridors Redwoods to the Sea Planning	Save-the-Redwoods League	Comprehensive planning effort seeking to create habitat linkage, late-seral forest habitat, and public access between Humboldt Redwoods State Park and the Lost Coast.	
Dynamics of Recovery: A Plan to Enhance the Mattole Estuary	Mattole Restoration Council	Detailed results from four years of stream flow and bed observations in the Mattole Estuary; includes test restoration projects and recommendations for estuary restoration. Focuses on upstream sources of sediment, particularly roads.	www.krisweb.com/biblio/mattole_mrc_xxxx_1985_dynamicsrecov.pdf
Five-year Plan for Salmon Stock Rescue Operations; 2001-2002 through 2004-2005 Seasons	Mattole Salmon Group	Addresses the Mattole Salmon Group's goal of restoring and enhancing wild salmonid populations in the Mattole River, focusing on stock recovery, escapement objectives, natural production, genetic conservation, fluvial restoration and revegetation, outreach, monitoring and evaluation. Included priority projects and detailed project descriptions.	

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Eureka Plain/ Humboldt Bay		CW	included		City of Arcata Environmental Services Department 736 F Street Arcata, CA 95521 (707) 822-8184 eservices@arcatacityhall.org
Local	Eureka Plain/ Humboldt Bay	Ongoing	WQ			North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, California 95403 (707) 576-2220
Local	Eel	Ongoing	WQ, AB	included	SP	Michael Bowen California State Coastal Conservancy 1330 Broadway, 11th Floor Oakland, CA 94612 (510) 286-1015
Local	Mattole	Ongoing	HL			Ruskin Hartley Save-the-Redwoods League 114 Sansome Street, Room 1200 San Francisco, CA 94104 (415) 362-2352
Local	Mattole		AB, FO, LU, TB, HL, RH, WQ	none	RA	Mattole Restoration Council P.O. Box 160 Petrolia, CA 95558 (707) 629-3514 mrc@mattole.org
Local	Mattole		AB, RH	none	none	Mattole Salmon Group P.O. Box 188 Petrolia, CA 95558 (707) 629-3433 salmon@humboldt.net

North Coast Planning Resource	Organization	Description	Web Addresses
King Range National Conservation Area Management Plan	Prepared for the Bureau of Land Management	Comprehensive park plan updating management strategies for BLM's King Range NCA; provides general characterization of park, ecology, circulation and recommendations for their enhancement.	
Lower Mattole Fire Plan	Lower Mattole Fire-Safe Council	Fire Plan done with Mattole Restoration Council. Prioritizes water supply, fuel reduction, education and agency cooperation. Online.	www.mattole.org/html/publications_publication_2.html
Mattole Implementation Plan	Upper Mattole River and Forest Cooperative	Organization came together from MOU with agencies and the Sanctuary Forest to plan for resources in the upper Mattole; Sanctuary Forest has compiled some survey information for priority areas to address in the Upper Mattole. Generating their own implementation plan that will fold in with the watershed enhancement plan	
Mattole North Coast Watershed Assessment Program (NCWAP)	California Resources Agency, California EPA	Watershed-wide assessment of geologic, hydrologic, water quality, land use and riparian conditions in the Mattole watershed relating to viability for anadromous fish populations. Includes subbasin recommendations, extensive baseline data creation and synthesis, a basin geological report mapping landslide potential and sediment production, analysis of the suitability of stream reaches for salmonid production and refugia. Tests specific hypotheses for each subbasin.	www.ncwatershed.ca.gov
Mattole River Total Maximum Daily Load (TMDL)	North Coast Regional Water Quality Control Board, U.S. EPA	TMDL technical documents are complete for sediment and temperature.	www.swrcb.ca.gov/rwqcb1/programs/tmdl/mattole/mattole.html www.epa.gov/region09/water/tmdl/final.html

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Mattole		PA, OS, TB, AB	included	RA	BLM Arcata Field Office 1695 Heindon Road Arcata, CA 95521 (707) 825-2300
Local	Mattole		FO, PA	included	SP	Lower Mattole Fire Safe Council P.O. Box 20 Petrolia, CA 95558 firesafe@mattole.org
Local	Mattole	Ongoing	FO, AB	none	none	Eric Goldsmith, Executive Director Sanctuary Forest, Inc. P.O. Box 166 Whitethorn, CA 95589 (707) 986-1087
Local	Mattole		AB, RH, WQ, FO	included	RA; SP for refugia streams	Scott Downie Watershed Assessment Manager California Department of Fish and Game 1487 Sandy Prairie Court Fortuna, CA 95540 (707) 725-1050 sdownie@dfg.ca.gov
Local	Mattole		WQ	included	RA	North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, California 95403 (707) 576-2220

North Coast Planning Resource	Organization	Description	Web Addresses
Mattole Watershed Plan	Mattole River and Range Restoration Partnership, Mattole Restoration Council	Prepared with input from the Mattole Restoration Council, Mattole Salmon Group, Mid Mattole Conservancy, Sanctuary Forest, Inc., and the Mattole Technical Advisory Committee, the Mattole Watershed Plan will set forth a 30 year vision for the watershed and an associated 5-year "implementation" plan. The implementation plan will develop projects such as riparian planting, instream enhancement, invasive exotics removal, fuel load reduction, channel monitoring, salmon rearing, restoration forestry, and landscape conservation strategies.	www.mattole.org/program_services/watershed-plan.htm
Sinkyone Wilderness State Park General Plan	California Dept. of Parks and Recreation	State Park General Plan that will determine management measures for the 7,367 acre Sinkyone Wilderness State Park, including natural habitat protection, circulation, fire management, and infrastructure development planning.	www.parks.ca.gov/default.asp?page_id=22578
Ten Mile River Total Maximum Daily Load (TMDL)	North Coast Regional Water Quality Control Board, U.S. EPA	Technical TMDL is completed for sediment, work remains to be scheduled for impairment by temperature.	www.swrcb.ca.gov/rwqcb1/programs/tmdl/tenmile/tenmile.html www.epa.gov/region09/water/tmdl/final.html
MacKerricher State Park - Coastal Dune and Sensitive Species Plan	California Department of Parks and Recreation (DPR)	Plan to identify threats to sensitive species and develop management recommendations for their protection within a 2,300-acre state park and reserve.	
Noyo River Total Maximum Daily Load (TMDL)	California State Coastal Conservancy	Technical TMDL for sediment completed.	www.swrcb.ca.gov/rwqcb1/programs/tmdl/noyoriver/noyo.html www.epa.gov/region09/water/tmdl/final.html

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Mattole	Ongoing	AB, WQ, LU, RH,	included	RA, may have prioritization	Chris Larson, Executive Director Mattole Restoration Council P.O. Box 160 Petrolia, CA 95558 (707) 629-3514 chris@mattole.org
Local	Rockport/Usal	Ongoing	AB, TB, PA, OS, CR	included	RA	Steve Horvitz North Coast Redwoods District P.O. Box 2006 Eureka, CA 95502 (707) 445-6547
Local	Ten Mile		WQ			North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, CA 95403 (707) 576-2220
Local	Noyo	Ongoing	AB, TB			Renee Pasquinelli California State Parks Mendocino District P.O. Box 440 Mendocino, CA 95460 (707) 937-5804
Local	Noyo	Ongoing	WQ			Michael Bowen California State Coastal Conservancy 1330 Broadway, 11th Floor Oakland, CA 94612 (510) 286-1015

North Coast Planning Resource	Organization	Description	Web Addresses
Big River Preliminary Plan: Resource Assessment and Recommendations	Mendocino Land Trust	MLT has developed a preliminary management plan for the Big River unit of Mendocino Headlands State Park in consultation with the California Department of Parks and Recreation and the California State Coastal Conservancy. Primarily funded by the California State Coastal Conservancy.	www.mendocinolandtrust.org/projects/brpp.shtml
Watershed Guidelines for Big River Watershed	Big River Watershed Council	Local watershed plan created to provide the National Marine Fisheries Service with a set of practical, enforceable, and scientifically-based guidelines that will provide for immediate measures to protect coho salmon and their habitat in the Big River watershed.	www.krisweb.com/biblio/big_bigrvrwc_xxxx_1997.htm
Navarro River Total Maximum Daily Load (TMDL)	North Coast Regional Water Quality Control Board, U.S. EPA	The Technical TMDL for sediment and temperature are completed.	www.swrcb.ca.gov/rwqcb1/programs/tmdl/navarro/navarro.html www.epa.gov/region09/water/tmdl/final.html
Navarro Watershed Restoration Plan	Prepared for the California State Coastal Conservancy, Mendocino County Water Agency and Anderson Valley Land Trust	A plan to identify and prioritize water quality problems affecting anadromous fish populations in the Navarro River basin, engage landowners in efforts to improve water quality, and prepare a water quality assessment and improvement plan for prioritized problems.	www.krisweb.com/biblio/navarro_mcwa_entrix_1998_restplan.pdf http://endeavor.des.ucdavis.edu/nrpi/NRPIDescription.asp?ProjectPK=4683
Garcia Estuary Feasibility Study, Phase I (Moffatt & Nichol for MCRCD, 06/96)	Mendocino County RCD	Garcia Estuary Feasibility Study, Phase I (Moffatt & Nichol for MCRCD, 06/96) is a study of the feasibility of the improvements proposed in the MCRCD's 1992 Garcia River Watershed Enhancement Plan.	http://mrcd.ca.nacdnet.org
Garcia River Bank Erosion Study (Moffatt & Nichol, 03/95)	Mendocino County RCD	The Garcia River Bank Erosion Study notes that grazing practices have reduced the vegetation cover along the banks of the river, which has resulted in bank erosion at several reaches along the river.	http://mrcd.ca.nacdnet.org

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Big River		AB, CR, CW, HL, MB, LU, PA, RH, TB, WQ	included	RA, SP	Matthew Gerhart Mendocino Land Trust P.O. Box 1094 Mendocino, CA 95460 (707) 962-0470 bigriver@mendocinolandtrust.org
Local	Big River		AB, RH, TB, WQ, HL	none		
Local	Navarro		WQ	included	RA	North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, California 95403 (707) 576-2220
Local	Navarro		WQ, AB, LU		RA	Mendocino County Water Agency Courthouse 100 South State Street Ukiah, CA 95482 (707) 463-4589 Anderson Valley Land Trust P.O. Box 141 Boonville, CA 95415 (707) 895-3150
Local	Garcia		WQ, AB, HL, RH			Mendocino County Resource Conservation District 405 South Orchard Avenue Ukiah, CA 95482 (707) 468-9223
Local	Garcia		WQ, AB, HL, RH			Mendocino County Resource Conservation District 405 South Orchard Avenue Ukiah, CA 95482 (707) 468-9223

North Coast Planning Resource	Organization	Description	Web Addresses
Garcia River Total Maximum Daily Load (TMDL)	North Coast Regional Water Quality Control Board, U.S. EPA	This TMDL process for sediment was the first completed in the region; includes the TMDL document (EPA) as well as the Garcia River Water Quality Attainment Action Plan for Sediment. Garcia River has moved into the TMDL implementation phase.	www.swrcb.ca.gov/rwqcb1/programs/tmdl/garcia/garcia.html www.epa.gov/region09/water/tmdl/final.html
Garcia River Watershed Enhancement Plan	Mendocino County Resource Conservation District	The Garcia River Watershed Enhancement Plan lists among its goals: to foster the conservation, restoration and sound management of the Garcia River's natural resources; identify limiting factors and adverse impacts that contribute to the decline of salmonid populations, such as sediment sources in upland areas; identify and target for treatment areas of accelerated erosion which impact water quality and fisheries; identify recreational opportunities within the watershed that may be enhanced; and support legitimate public access to the river for recreational uses.	
Gualala River North Coast Watershed Assessment Program (NCWAP)	California Resources Agency, California EPA	Watershed-wide assessment of geologic, hydrologic, water quality, land use and riparian conditions in the Gualala watershed relating to viability for Anadromous fish populations. Includes subbasin recommendations, extensive baseline data creation and synthesis, a basin Geological Report mapping landslide potential and sediment production, analysis of the suitability of stream reaches for salmonid production and refugia. Tests specific hypotheses for each subbasin.	www.ncwatershed.ca.gov
Gualala River Total Maximum Daily Load (TMDL)	North Coast Regional Water Quality Control Board, U.S. EPA	Technical TMDL for sediment completed.	www.swrcb.ca.gov/rwqcb1/programs/tmdl/gualala/gualala.html www.epa.gov/region09/water/tmdl/final.html

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Garcia	Ongoing	WQ			North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, California 95403 (707) 576-2220
Local	Garcia		WQ, AB, HL, RH	none	SP	Mendocino County Resource Conservation District 405 South Orchard Avenue Ukiah, CA 95482 (707) 468-9223
Local	Gualala		AB, RH, WQ, FO	included	RA; SP for refugia streams	Robert Klamt Watershed Assessment Manager N. Coast Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, CA 95403 (707) 576-2693 klamr@rb1.swrcb.ca.gov
Local	Gualala		WQ	included	RA	North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, California 95403 (707) 576-2220

North Coast Planning Resource	Organization	Description	Web Addresses
Gualala River Watershed Literature Search and Assimilation	Prepared for Redwood Coast Land Conservancy with funding by Coastal Conservancy	Summary of information on the Gualala River watershed and its fisheries resources. Historical and recent documents from a wide variety of sources.	www.krisweb.com/biblio/gualala_rclc_higgins_1997_litsearch.pdf
Laguna de Santa Rosa Total Maximum Daily Load (TMDL)	North Coast Regional Water Quality Control Board, U.S. EPA	For Nutrients, Sediment, Temperate, not currently started.	www.swrcb.ca.gov/rwqcb1/programs/tmdl/ldsr/lagunadsr.html
Phase 1 Final Report, Santa Rosa Plain Vernal Pool Ecosystem Preservation Plan	Prepared for Santa Rosa Plain Vernal Task Force	A congressionally appointed vernal pool task force was formed to bring together federal, state and local agencies, as well as landowners and local interest groups. A goal of the task force was to develop a plan containing policies and guidance for future land use and vernal pool ecosystem protection in the Santa Rosa Plain.	www.spn.usace.army.mil/regulatory/srp/srpreport.pdf
Russian River Action Plan, 2nd Edition	Sonoma County Water Agency	Provided a detailed listing of actions needed to protect listed fish species, and identified opportunities to coordinate and cooperate with federal, state and local agencies to gain federal and/or state funding for projects.	www.scwa.ca.gov/rraction-plan.html
Russian River Estuary Study 1992-1993	Prepared for Sonoma County and California State Coastal Conservancy	Evaluates the impacts of artificially breaching the river mouth and selects a preferred estuary (adaptive) management program model.	www.russianriverwatershed.net/docManager/1000001980/Russian%20River%20Estuary%20Study%201992-1993.pdf

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Gualala		WQ, AB	none (data sets are noted, however)		Michael Bowen, Project Manager California State Coastal Conservancy 1330 Broadway, 11th Floor Oakland, CA 94612 (510) 286-1015 Redwood Coast Land Conservancy P.O. Box 1511 Gualala, CA 95445 www.rclc.org
Local	Russian River		WQ			North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, California 95403 (707) 576-2220
Local	Russian River					
Local	Russian River	2003 (1st edition 1997)	AB			Sonoma County Water Agency P.O. Box 11628 Santa Rosa, CA 95406 (707) 526-5370
Local	Russian River	1992-1993				Department of Planning Sonoma County Melanie Heckel, Project Manager 2550 Ventura Avenue Santa Rosa, California 95403 (707) 565-1900

North Coast Planning Resource	Organization	Description	Web Addresses
Russian River Resources Assessment and Public Access Plan	California State Coastal Conservancy	A comprehensive study of the Russian River watershed by Circuit Rider Productions, Inc. funded by the California State Coastal Conservancy at the request of Mendocino and Sonoma Counties. A primary objective of the plan was to identify areas for public access – over three dozen potential sites were reviewed from Ukiah to Jenner (120 miles).	
Towards a Healthy Wildland Watershed: Willow Creek Watershed Protection	Prepared for Stewards of the Coast and Redwoods (formerly Stewards of Slavianka)	Includes vision and goals for watershed health and function, watershed history, watershed diagnosis, and watershed enhancement projects.	www.stewardsofthecoast-andredwoods.org/willow-creek.htm www.parks.ca.gov/gener-alplans
Stemple Creek Total Maximum Daily Load (TMDL)	North Coast Regional Water Quality Control Board, U.S. Environmental Protection Agency (EPA)	Technical TMDL for nutrients and sediment complete.	www.swrcb.ca.gov/rwqcb1/programs/tmdl/stemple/stemple.html www.epa.gov/region09/water/tmdl/final.html
Big Lagoon Wetland and Creek Restoration Project: Part II: Feasibility Analysis Report, February 2004. *Big Lagoon Wetland and Creek Restoration Project: Part III. Addendum to Feasibility Analysis Report.*	Golden Gate National Recreation Area (GGNRA)	Restoration alternatives for the project site known as Big Lagoon. The Big Lagoon site includes the wetlands, floodplain, and lagoon at the mouth of Redwood Creek at Muir Beach, Marin County, California. GGNRA contracted with Jones and Stokes to complete the EIS/EIR Draft Environmental Impact Statement / Report, which is expected to be released to the public in 2005.	www.nps.gov/goga/admin/planning/big_lagoon

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Russian River		PA			Richard Retecki California State Coastal Conservancy 1330 Broadway, 11th Floor Oakland, CA 94612 (510) 286-1015
Local	Russian River		WQ, RH			Stewards of the Coast and Redwoods (formerly Stewards of Slavianka) P.O. Box 2 Duncan Mills, CA 95430 (707) 869-9177
Local	Estero de San Antonio		WQ	none		North Coast Regional Water Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, California 95403 (707) 576-2220
Local	Marin Coastal		CW, MB			Carolyn Shoulders, Co-Project Manager National Park Service, GGNRA Division of Natural Resource & Science Fort Mason Building 201, 2nd Floor San Francisco, CA 94123 (415) 331-0771

North Coast Planning Resource	Organization	Description	Web Addresses
Bolinas Lagoon Ecosystem Restoration Project	Marin County Open Space District	The Corps of Engineers, with financial support from the federal government, the State of California and the Marin County Open Space District (the project's local sponsor), commenced a Feasibility Study in 1998 to develop a plan to restore the lagoon's habitats. The Corps released its Draft Feasibility Report and Draft EIR/EIS for the Bolinas Lagoon Ecosystem Restoration Project in 2002. The Open Space District, with funding from the State of California and private donations, is presently coordinating a rigorous scientific review of the report's assumptions and conclusions to ensure that intervention to restore the lagoon's ecosystems is warranted. Concurrently, and for the same purpose, the Corps is conducting additional studies concerning sediment transport in the lagoon.	www.marinopenspace.org/os_bolinaslagoonmgt-plan.asp
General Management Plan Update	Point Reyes National Seashore	Point Reyes National Seashore is currently undergoing a comprehensive general management plan update; includes a full taxa biological survey for the park.	www.nps.gov/pore/home_mngmntdocs_GMP2003concepts.htm
Policy Review Initiative Final Report	Marin County Open Space District, County of Marin, Dept. of Parks and Open Space	Between September 2003 and November 2004, Open Space District staff and members of the former County Open Space and Trails Committee conducted a review of Open Space District land management policies in 11 policy areas related to core land management, fire, trail use, non-native plants and animals, special status species, parking, camping, visitor amenities, disabled access, countywide and regional trail systems, and public outreach. The product of this endeavor is a set of 51 new policies to guide land management decision making in the subject policy areas.	www.marinopenspace.org/pdf/PRI-Final-Report-5-19-2005.pdf www.marinopenspace.org/os_about.asp
Redwood Creek Watershed: Vision for the Future	National Park Service, Golden Gate National Recreation Area (GGNRA)	The vision serves as a guideline to support future planning and projects in the watershed so that they meet the common goals described herein as developed by a broad group of public agencies and the public.	www.redwoodcreek.org www.redwoodcreek.org/pdf/rcw_vision72dpi.pdf

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Bolinas Lagoon	Ongoing	CW, MB			Marin County Open Space District Marin County Civic Center 3501 Civic Center Drive, Room 415 San Rafael, CA 94903 (415) 499-6387
Local	Marin Coastal	Ongoing	AB, TB, OS, PA, CW, HL, RH	included	RA	Point Reyes National Seashore 1 Bear Valley Road Point Reyes Station, CA 95456 (415) 464-5100
Local	Marin Coastal	Approved May 10, 2005	OS, PA			Marin County Open Space District Marin County Civic Center 3501 Civic Center Drive, Room 415 San Rafael, CA 94903 (415) 499-6387
	Redwood Creek					Jennifer Vick, Redwood Creek Watershed Planning Manager GGNRA Fort Mason, Building 201 San Francisco, CA 94123 (415) 561-4942 jennifer_vick@nps.gov

North Coast Planning Resource	Organization	Description	Web Addresses
Sediment Overview Report: Development of an Initial Sediment-Management Plan for Lagunitas Creek, Marin County, California	Prepared for the Marin Municipal Water District by Balance Hydrologics, Inc.	Sediment Management Plan for Lagunitas Creek.	
The Walker Creek Watershed Restoration Program	Marin County Resource Conservation District	Report of findings and recommendations of an inventory of erosion problems in the watershed.	www.sonomamarinrcds.org/district-mc/info.html#reports
Tomales Bay Watershed Stewardship Plan: A Framework for Action	Tomales Bay Watershed Council	Collaborative watershed-based planning effort bringing multiple stakeholders together to plan for watershed sustainability. Goals are to ensure water quality in Tomales Bay and tributary streams sufficient to support natural resources and sustain beneficial uses; restore and preserve the integrity of natural habitats and native communities; and develop strategies to implement the Plan and to protect the watershed.	www.tomalesbaywatershed.org/stewardship.html
Database / Information Sources			
GIS Data Links for Northern California	Colin Brooks	Exhaustive online catalog of GIS-related links for Northern California. Includes GIS resources for northern California, other California links, private company links, university and government sites, ArcView and ArcGIS script sites, Mendocino County GIS user's group, Interactive Web-Mapping, and GIS employment.	www.pacificsites.com/~cbrooks/gis1.shtml#seven
All Taxa Biodiversity Inventory (ATBI) for Point Reyes	National Park Service	A five-year inventory of all species of living organisms in Tomales Bay and surrounding Point Reyes National Seashore, coordinated through the Pacific Coast Science and Learning Center at Point Reyes National Seashore. Paired up with the Tomales Bay Biodiversity Partnership.	www.nps.gov/pore/science_current_atbi.htm www.tomalesbaylife.org

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Local	Lagunitas Creek		WQ			Marin Municipal Water District 220 Nellen Avenue Corte Madera, CA 94925 (415) 945-1455 water@marinwater.org
Local	Walker Creek				SP	Nancy Scolari Marin RCD P.O. Box 1146 Point Reyes Station, CA 94956 (415) 663-1170
Local	Tomales Bay		WQ, AB, RH, CW	none		Neysa Kind, Coordinator Tomales Bay Watershed Council P.O. Box 447 Point Reyes Station, CA 94956 (415) 663-9092
Information/ Data	California	Ongoing				Colin Brooks UC Berkeley Integrated Hardwood Range Management Program 4070 University Road Hopland, CA 95449 cbrooks@nature.berkeley.edu
Information/ Data	Marin Coast	Ongoing	AB, TB	included	RA	Ben Becker, Research Director National Park Service ben_becker@nps.gov

North Coast Planning Resource	Organization	Description	Web Addresses
Atlas of the Biodiversity of California	California Department of Fish and Game	A comprehensive biodiversity mapping effort put together to illustrate for general audiences the scope of the state's geography and plant and animal diversity; illustrated and companioned by articles from DFG specialists.	http://atlas.dfg.ca.gov
Biogeographic Information and Observation System (BIOS)	California Department of Fish and Game	BIOS is a system designed to enable the management, visualization, and analysis of biogeographic data collected by the Department of Fish and Game and its partner organizations.	http://bios.dfg.ca.gov/
Bird Conservation Directory	American Bird Conservancy	List of major avian planning efforts and their constituents.	http://abcbirds.org/directory/directory.htm
CalFish	Multi-agency Collaborative Project	Collaborative effort to construct a data warehouse focusing on fisheries management, with layers of disparate data brought together for use by the public. Collaborating agencies include the Pacific States Marine Fisheries Commission, California Department of Fish and Game, California State Coastal Conservancy, NOAA Fisheries, CALTRANS, and the California Department of Water Resources. Data resources include: CALFISH Data and Mapping utilities, Anadromous Abundance and Trends, Anadromous Distribution, Fish Passage Assessment, Hydrography, the California Habitat Restoration Project Database, and Stream Habitat Data, as well as other information resources.	www.calfish.org

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Information/ Data			AB, TB	included	RA	California Department of Fish and Game Wildlife and Habitat Data Analysis Branch 1807 13th Street, Suite 202 Sacramento, CA 95814 (916) 322-2493
Information/ Data	California	Ongoing	AB, TB			California Department of Fish and Game Wildlife and Habitat Data Analysis Branch 1807 13th Street, Suite 202 Sacramento, CA 95814 (916) 322-2493 whdab@dfg.ca.gov
Information/ Data			MB			American Bird Conservancy P.O. Box 249 The Plains, VA 20198 (540) 253-5780
Information/ Data		Ongoing	AB	included	RA	Feedback form available on website.

North Coast Planning Resource	Organization	Description	Web Addresses
California Digital Conservation Atlas	California State Resources Agency	Interactive GIS atlas of various types of conservation information, including conservation planning. Has land trust locations, recent and ongoing planning efforts, NRPI inventory (see below, less updated than ICEmaps), projected growth; urban areas; fine and coarse landcover; impaired streams and waterbodies; public lands and open space preservation; 1945 forest cover maps; prime agriculture land maps; CDDNB species by quad; CRMP/watershed plans; NCCP/HCPs, national wetlands inventory; wild and scenic; water districts; fire history; California Wildlife Habitat Relationship (CWHR) species ranges. The Legacy Project was recently de-funded by the State.	http://atlas.resources.ca.gov http://legacy.ca.gov/new_atlas.epl
California Environmental Resource Evaluation System (CERES)	California Resources Agency	A project of the Resources Agency, functioning as an information clearinghouse for environmental and public agency data. Includes LUPIN (see below).	http://ceres.ca.gov
California GAP Analysis Project	University of California Santa Barbara, Department of Geography	California's GAP analysis project, run through UCSB Geography, seeks to protect biodiversity by identifying gaps between land areas that are rich in biodiversity and areas that are managed for conservation. The GAP Analysis process maps habitat and species diversity and compares it to existing biological preserves.	www.biogeog.ucsb.edu/projects/gap/gap_home.html
California Natural Diversity Data Base (CNDDB)	California Department of Fish and Game - Wildlife Habitat and Data Analysis Branch	State program that inventories the status and locations of rare plants and animals in California. CNDDB staff work with partners to maintain current lists of rare species as well as maintain an ever-growing database of GIS-mapped locations for these species of concern. CNDDB is integrated into NatureServe's national network of "Natural Heritage Programs."	www.dfg.ca.gov/whdab/html/cnddb.html

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Information/ Data	California		AB, AG, CR, CW, FO, HL, LU, MB, OG, OS, PA, RH, RE, TB, WQ	included	RA	Resources Agency 1416 Ninth Street, Suite 1311 Sacramento, CA 95814 (916) 653-5656
Information/ Data	California					CERES 900 N Street, Suite 250 Sacramento, CA 95814
Information/ Data	California	Ongoing	TB, AB	included		UCSB Biogeography Lab Donald Bren School of Environmental Science & Management 3017 Bren Hall University of California, Santa Barbara Santa Barbara, California 93106 (805) 893-7044 stoms@bren.ucsb.edu
Information/ Data	California	Ongoing	AB, TB	included	RA	California Department of Fish and Game Wildlife and Habitat Data Analysis Branch 1807 13th Street, Suite 202 Sacramento, CA 95814 (916) 322-2493 whdab@dfg.ca.gov

North Coast Planning Resource	Organization	Description	Web Addresses
California Rivers Assessment (CARA)	Information Center for the Environment	Interactive database designed to give policy-makers resource management information for California rivers. CARA contains 39 sets of mapped geographical information system (GIS) layers, 60 sets of tabular (database) and textual (text) data, as well as links (internet) to 510 additional maps, tables and texts located on other servers. All of this data is organized by watershed and theme. Resulted in a "Professional Judgment Assessment" showing priorities for aquatic conservation.	http://endeavor.des.ucdavis.edu/newcara
California Wildlife Habitat Relationships (CWHR)	California Department of Fish and Game	California Wildlife Habitat Relationships is an information system correlating 675 regularly-occurring terrestrial vertebrates with habitat by analyzing life history and range information. The system allows for predictive modeling of wildlife populations based on habitat characteristics.	www.dfg.ca.gov/whdab/html/cwhr.html
Environmental Conservation Online System (ECOS)	U.S. Fish and Wildlife Service	Environmental Conservation Online System (ECOS) is a gateway web site that provides access to data systems in the endangered species and fisheries and habitat conservation program areas, as well as other USFWS and government data sources. ECOS provides a central point of access to assist USFWS personnel in managing data and information as well as provide general public access to information from numerous USFWS databases. Includes the threatened and endangered species system, critical habitat portal, conservation plans and agreements, fish passage decision support system, and containment assessment process, as well as a online mapping utility called Geotract.	http://ecos.fws.gov
EPA EnviroMapper	Environmental Protection Agency	Online tool for mapping a suite of publicly available data, including air releases, drinking water, toxic releases, hazardous wastes, water discharge permits, and Superfund sites.	www.epa.gov/enviro/html/em/index.html

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Information/ Data	California	Ongoing	WQ, AB, LU	included	RA	Information Center for the Environment (ICE) University of California, Davis One Shields Avenue Davis, California 95616 (530) 752-0532
Information/ Data	California	Ongoing	TB	included		California Department of Fish and Game Wildlife and Habitat Data Analysis Branch 1807 13th Street, Suite 202 Sacramento, CA 95814 (916) 322-2493 whdab@dfg.ca.gov
Information/ Data		Ongoing	TB, AB	included		Help Desk can be reached at: http://ecos.fws.gov/ecos/helpDesk.do
Information/ Data	National	Ongoing	LU, WQ, AB, TB	included		Contact form at: http://www.epa.gov/enviro/html/em/em_feedback.html

North Coast Planning Resource	Organization	Description	Web Addresses
Habitat Conservation Planning Branch	California Department of Fish and Game	Links to three principal planning and permitting processes of California DFG, including: the Conservation Planning Program, which includes Natural Community Conservation Planning (NCCP) and Federal Habitat Conservation Planning (HCP) among its initiatives; the CESA/CEQA permitting program handling the State's environmental documentation and permitting; and the Species Conservation and Recovery Program, which coordinates listing and recovery efforts for the State's endangered, threatened, and rare plants and animals, and compiles and distributes biological and status information on threatened and endangered species, species of special concern, and other native wildlife.	www.dfg.ca.gov/hcpb/index.shtml
Humboldt Bay Atlas	Humbolt Bay Harbor, Recreation and Conservation District (HRCD)	A project of the Humboldt Bay HRCD to create an interactive mapping product on the resources of Humboldt Bay. Includes layers on physical geography and water quality characteristics, biological parameters, bay infrastructure, and fish distribution information, as well as data downloads and GIS links.	http://maps.hostgis.com/harbor/gis/gis.html
ICEMAPS2	University of California, Davis, Information Center for the Enviroment	Interactive Web GIS mapping application that has various vegetation, watershed, riverine, land ownership layers, along with California DFG Natural Heritage Division layer of Significant Natural Areas and NRPI projects. Limited Query options, has California managed Areas and CalVeg as query selectors.	http://icemaps.des.ucdavis.edu/icemaps2/ICEMapInit.html
Information Center for the Environment - ICE	University of California, Davis	Collaborative project at UC Davis Department of Agriculture and Environmental Sciences, includes many partner sites, GIS and Mapping as well as natural resource database sourcing. Potentially useful links include: ICEMAPS, THP mapping server, aquatic diversity of California maps, California Rivers Assessment, MAB species inventories, watershed information and spatial data inventory, water quality standards inventory.	http://ice.ucdavis.edu
Internet Mapping Application Products and Solutions (IMAPS)	California Department of Fish and Game	Provides the public and department employees mapping services through its interactive web-based IMAPS Viewers.	http://imaps.dfg.ca.gov

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Information/ Data	California	Ongoing	AB, TB			California Department of Fish and Game Habitat Conservation Planning Branch 1416 Ninth Street Sacramento, CA 95814 (916) 653-4875
Information/ Data	Eureka Plain	Ongoing	AB, LU, CW	included	RA	Humboldt Bay Harbor, Recreation and Conservation District 601 Startare Drive P.O. Box 1030 Eureka, CA 95502 (707) 443-0801
Information/ Data	California	Ongoing	WQ, AB, TB, HL, RH, LU	included	RA	Information Center for the Environment (ICE) University of California, Davis One Shields Avenue Davis, California 95616 (530) 752-0532
Information/ Data	California	Ongoing	WQ, AB, TB, HL, RH, LU	included	RA	Information Center for the Environment (ICE) University of California, Davis One Shields Avenue Davis, California 95616 (530) 752-0532
Information/ Data	California	Ongoing		included		imaps@dfg.ca.gov.

North Coast Planning Resource	Organization	Description	Web Addresses
Klamath Resource Information System (KRIS)	Supported by the Institute for Fisheries Resources	A series of watershed-based data and information resources integrated through a custom software application, meant to provide easily and publicly available data on fisheries conditions and water quality. KRIS combines maps, data tables, charts, photographs and bibliographic materials into an easy-to-use, PC-based computer program that enables information to be shared quickly and easily among fisheries, government agencies, and private citizens.	www.krisweb.com
Land Use Planning Information Network (LUPIN)	California Resources Agency	Links to all official land use planning docs, including county plans. Part of CERES, the California Environmental Resources Evaluation system, this data catalog provides link to a broad range of official land use planning documents, including county plans, zoning, environmental documentation, maps, photos and reports. Searchable by county or bioregion.	http://ceres.ca.gov/planning
Natural Resources Projects Inventory (NRPI)	Information Center for the Environment and California Biodiversity Council	Part of UC Davis' Information Center for the Environment (ICE) and the California Biodiversity Council, a database of conservation, mitigation and restoration projects, including: 1) Watershed Projects Inventory, 2) California Ecological Restoration Projects Inventory, and 3) CA noxious weeds inventory. WPI includes CRMPS. Searchable by County, Agency, and Date.	http://endeavor.des.ucdavis.edu/nrpi
North Coast Watershed Assessment Program (NCWAP)	California Resources Agency, California EPA	Multi-Agency project performing watershed-wide assessment of geologic, hydrologic, water quality, land use and riparian conditions in the North Coast watersheds relating to viability for Anadromous fish populations. Includes subbasin recommendations, extensive baseline data creation and synthesis, analysis of the suitability of stream reaches for salmonid production and refugia. Tests specific hypotheses for each subbasin. The project only finished Mattole, Redwood Creek, and Gualala watersheds before funding was rescinded.	www.ncwatershed.ca.gov
Partners in Flight	Partners In Flight	Identifies regional planning efforts as well as species assessment databases for migratory and landbird conservation.	www.partnersinflight.org

Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Information/ Data	North Coast	Ongoing	WQ, AB, LU, FO	included	RA	Eli Asarian eli@krisweb.com
Information/ Data	California	Ongoing	LU, AB, TB	included		California Environmental Resources Evaluation System 900 N Street, Suite 250 Sacramento, CA 95814 (916) 654-9990
Information/ Data	California	Ongoing	TB, AQ, RH, WQ			Kevin Ward, NRPI Coordinator Information Center for the Environment University of California, Davis One Shields Avenue Davis, California 95616 (530) 752-2378 kcward@ucdavis.edu
Information/ Data		2001-2003	AB, RH, WQ, FO	included	RA	For General Program Questions: Cathy Bleier (916) 653-6598
Information/ Data			MB	included	RA	Partners in Flight contacts at: http://www.partnersinflight.org/contactus.cfm

North Coast Planning Resource	Organization	Description	Web Addresses
Point Reyes Bird Observatory Conservation Planning	Point Reyes Bird Observatory	Lists bird conservation planning efforts for North American as well as regional efforts: NABCI, North American Waterfowl Management Plan (Joint Ventures), Partners in Flight, U.S. Shorebird Conservation Plan and regions, and North American Waterbird Conservation plan.	www.prbo.org/cms/index.
The State of California Rivers	Trust for Public Land	2001 Report by Trust for Public Land characterizing the seven major hydrologic basins in California and providing information on subwatersheds, including information on public access and recreation, restoration and protection efforts, fish species of interest and local contact groups.	www.tpl.org/tier3_cdl.cfm?content_item_id=6501&folder_id=1685
Total Maximum Daily Load Assessments (TMDLs)	North Coast Regional Water Quality Control Board, U.S. EPA	Link lists final EPA-established TMDLS.	www.epa.gov/region09/water/tmdl/final.html
Total Maximum Daily Load Assessments (TMDLs)	North Coast Regional Water Quality Control Board, U.S. EPA	State North Coast Regional Water Quality Control Board's list of TMDLS; also has list of 303d impaired streams	www.swrcb.ca.gov/rwqcb1/programs/tmdl/Status.html
Total Maximum Daily Load Implementation Policy for Sediment Impaired Receiving Waters in the North Coast Region	North Coast Regional Water Quality Control Board	2004 policy guidance adopted by the Regional Water Quality Control board to guide implementation of sediment-related TMDLs in the North Coast Region.	www.waterboards.ca.gov/northcoast/programs/basinplan/tipfsiw.html
Wildlife and Habitat Data Analysis Branch	California Department of Fish and Game	Serves as the State's clearinghouse for biological data and center for conducting conservation analyses at statewide, regional, and local scales. Includes CNDDB, CalFish, Vegetation Mapping, BIOS, the California Biodiversity Atlas, CWHR, and NCWAP programs.	www.dfg.ca.gov/whdab/index.html

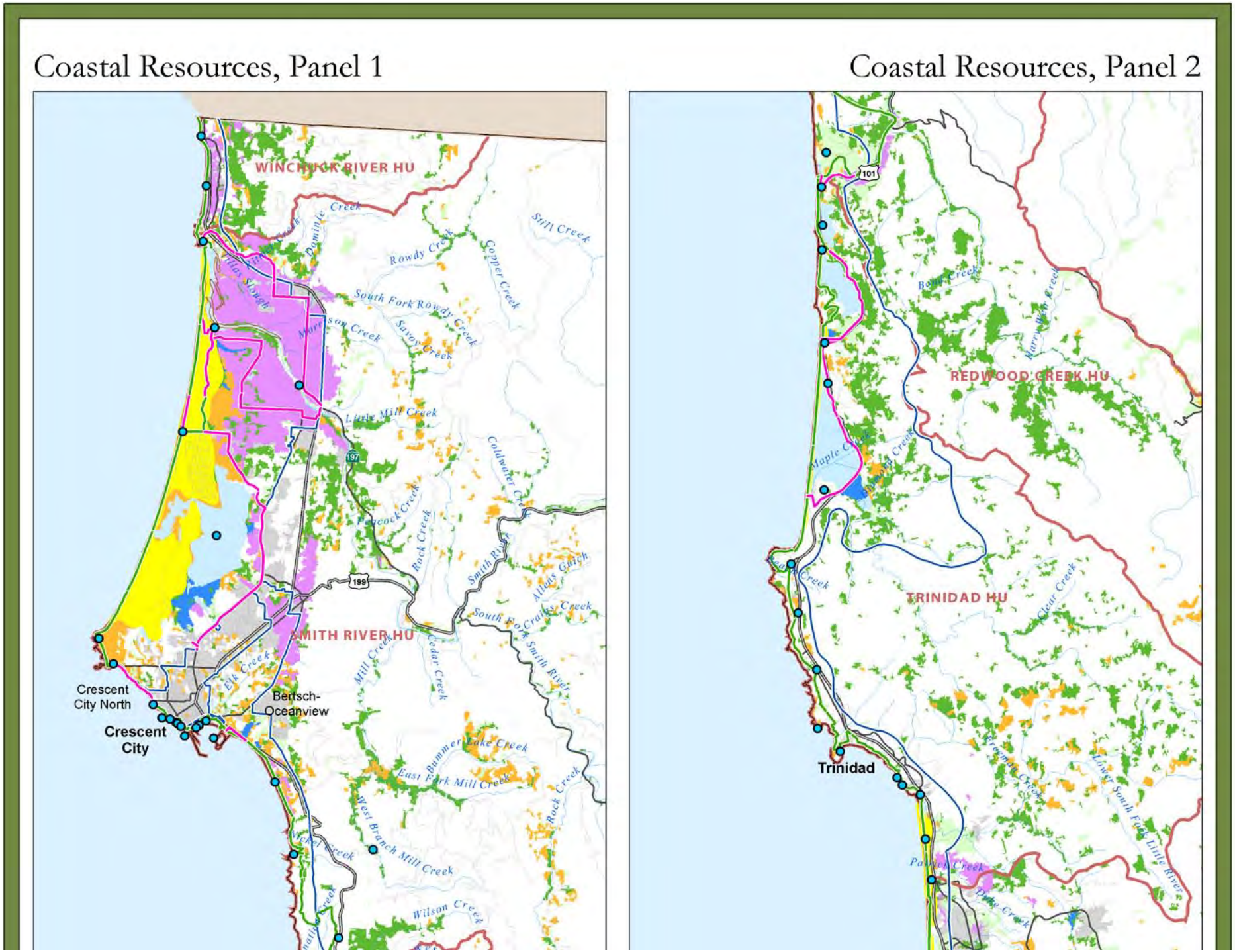
Scale	Location/ Watershed	Date	Primary Themes (see codes on page 218)	GIS Component	Presence of Resource Assessment (RA) or Spatial Prioritization (SP)	Contact Information
Information/ Data			MB			Point Reyes Bird Observatory 4990 Shoreline Highway Stinson Beach, CA 94970 (415) 868-1221
Information/ Data	California		WQ, AB, LU	none		Elise Holland Trust for Public Land Western Rivers Program elise.holland@tpl.org
Information/ Data			WQ			North Coast Regional Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, CA 95403 (707) 576-2220
Information/ Data			WQ	included	RA	North Coast Regional Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, CA 95403 (707) 576-2220
Information/ Data			WQ			North Coast Regional Quality Control Board 5550 Skylane Boulevard, Suite A Santa Rosa, CA 95403 (707) 576-2220
Information/ Data	California	Ongoing	AB, TB			California Department of Fish and Game Wildlife and Habitat Data Analysis Branch 1807 13th Street, Suite 202 Sacramento, CA 95814 (916) 322-2493 whdab@dfg.ca.gov

Key to Primary Themes

Theme Code	Theme
AB	Aquatic Biodiversity / Fisheries
AG	Agriculture
CR	Cult / Scenic / Historic Resources
CW	Coastal Wetlands
FO	Forestry / Timberland Mgmt
HL	Habitat Linkages
LU	Land Use / Transportation
MB	Migratory Birds
OG	Old Growth
OS	Open Space / Greenbelts
PA	Rec / Public Access
RE	Regional Resource Economics
RH	Riparian and Instream Habitat
TB	Terrestrial Biodiversity / R & ES
WQ	Water Quality / Sediment

Appendix 2: Coastal Resources Maps

Figure 9: Coastal Resources Map A



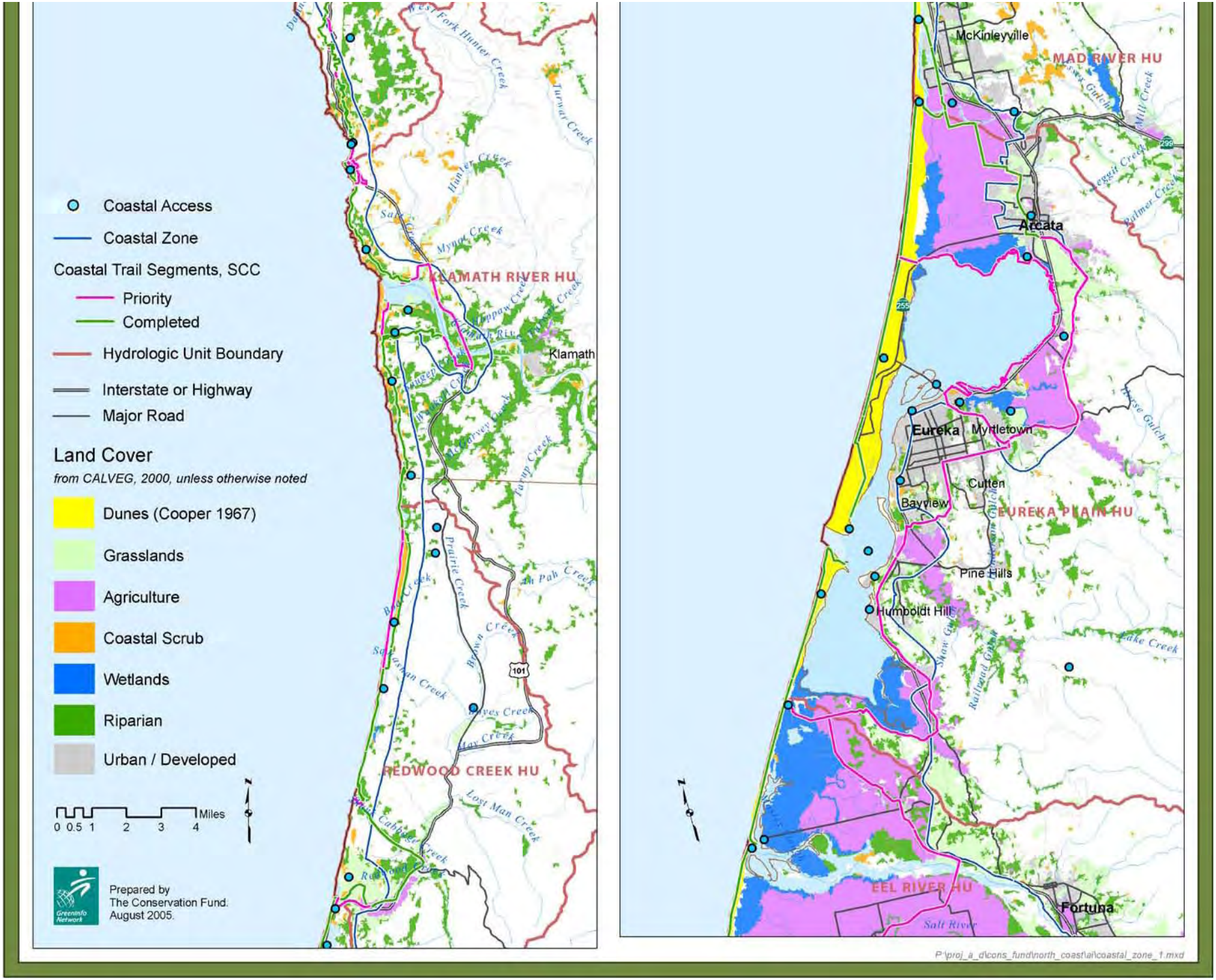

Coastal Access
Coastal Zone
Coastal Trail Segments, SCC
Priority
Completed
Hydrologic Unit Boundary
Interstate or Highway
Major Road
Land Cover
from CALVEG, 2000, unless otherwise noted
Dunes (Cooper 1967)
Grasslands
Agriculture
Coastal Scrub
Wetlands
Riparian
Urban / Developed
0 0.5 1 2 3 4 Miles
Prepared by
The Conservation Fund.
August 2005.
KLAMATH RIVER HU
REDWOOD CREEK HU
MAD RIVER HU
EUREKA PLAIN HU
EEL RIVER HU
McKinleyville
Arcata
Eureka
Myrtletown
Cutten
Bayview
Pine Hills
Humboldt Hill
Fortuna
Klamath
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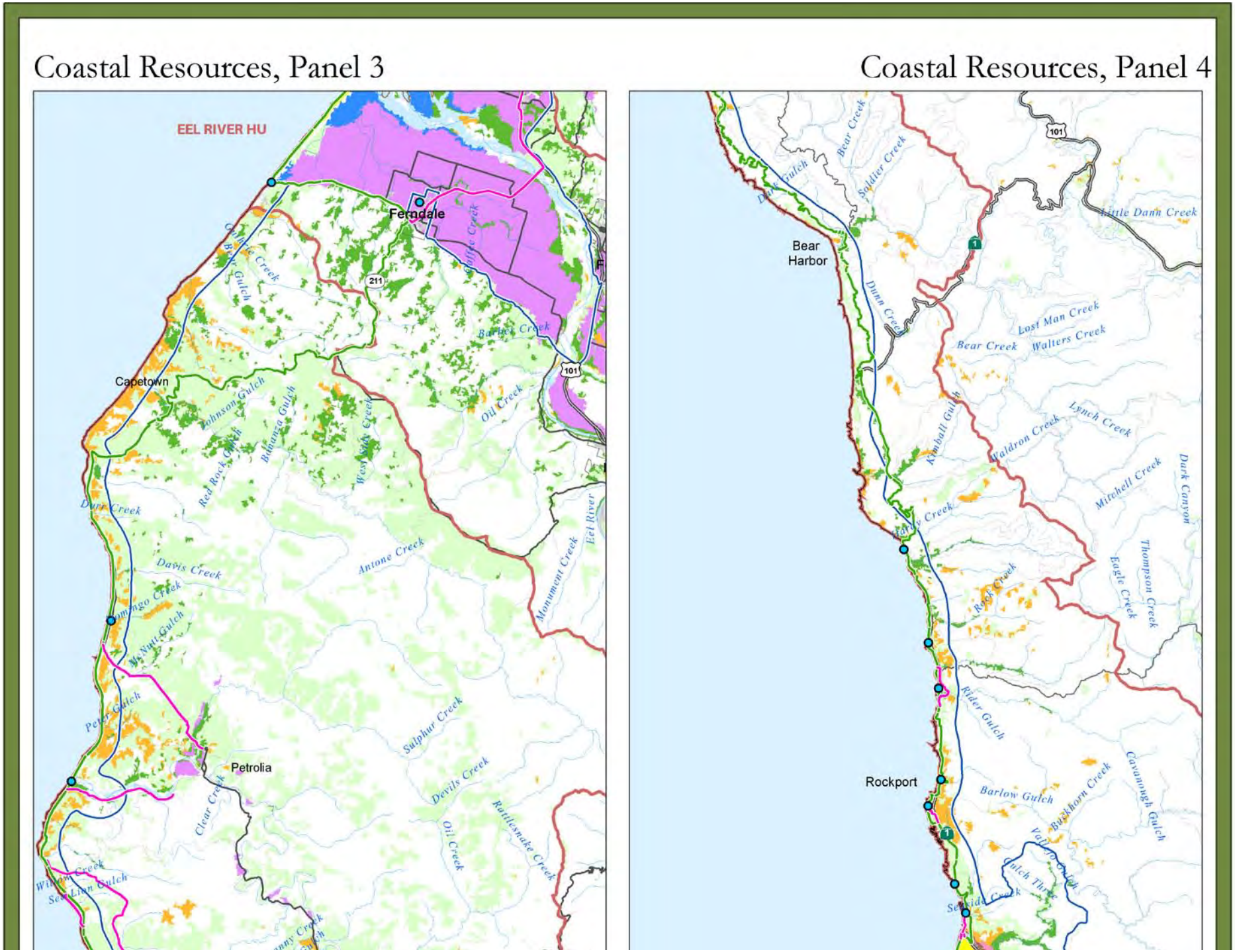
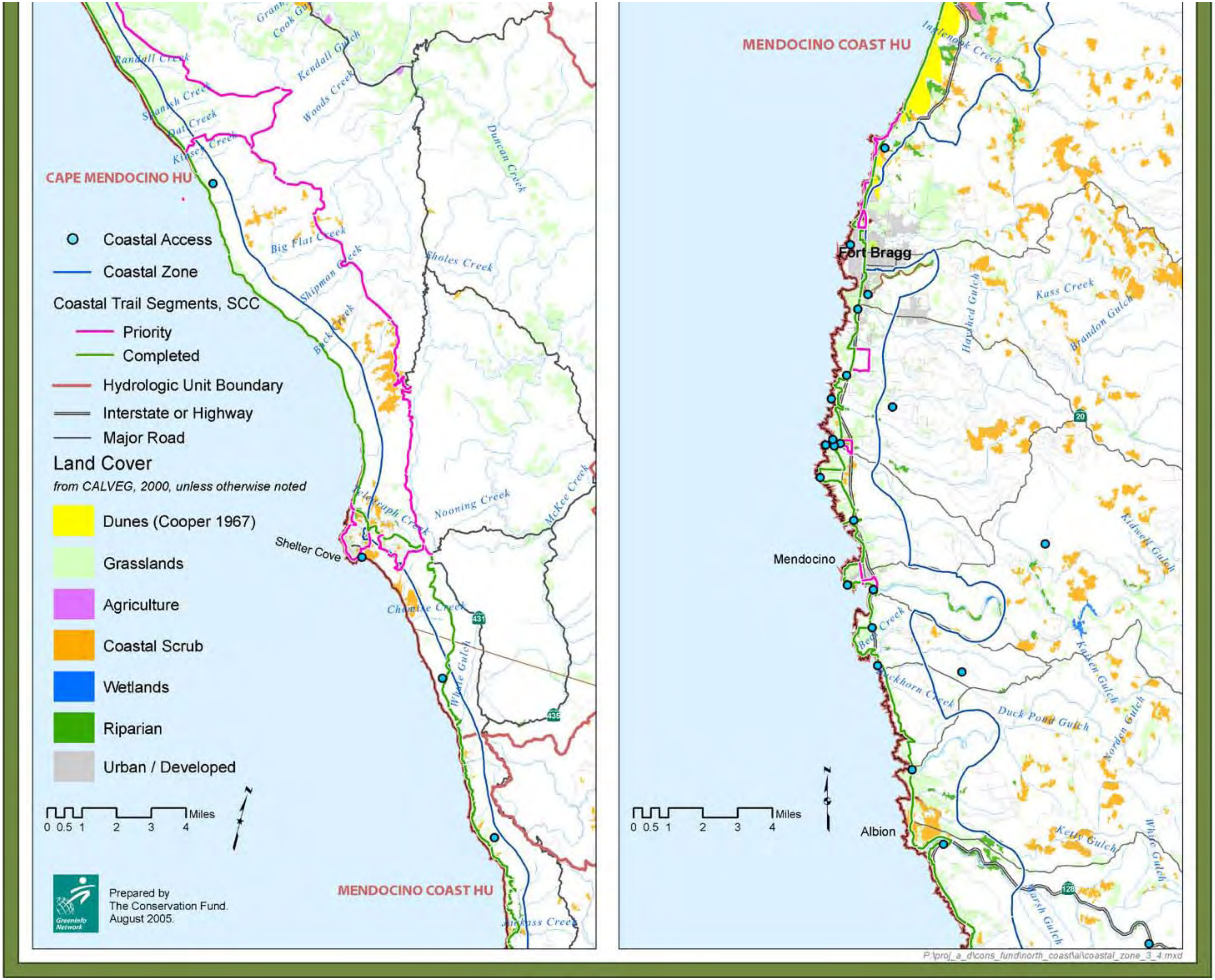
Figure 10: Coastal Resources Map B

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Coastal Access
Coastal Zone
Coastal Trail Segments, SCC
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Completed
Hydrologic Unit Boundary
Interstate or Highway
Major Road
Land Cover
from CALVEG, 2000, unless otherwise noted
Dunes (Cooper 1967)
Grasslands
Agriculture
Coastal Scrub
Wetlands
Riparian
Urban / Developed
0 0.5 1 2 3 4 Miles
Prepared by
The Conservation Fund.
August 2005.
Shelter Cove
Randall Creek
Spanish Creek
Oat Creek
Kinsey Creek
Kendall Gulch
Woods Creek
Duncan Creek
Big Flat Creek
Shipman Creek
Sholes Creek
Buck Creek
Telegraph Creek
Nooning Creek
McKee Creek
Whale Gulch
Fort Bragg
Mendocino
Albion
Inglenook Creek
Hayshed Gulch
Kass Creek
Brandon Gulch
Kidwell Gulch
Big Creek
Buckhorn Creek
Duck Pond Gulch
Norden Gulch
Kelly Gulch
White Gulch
Marsh Gulch
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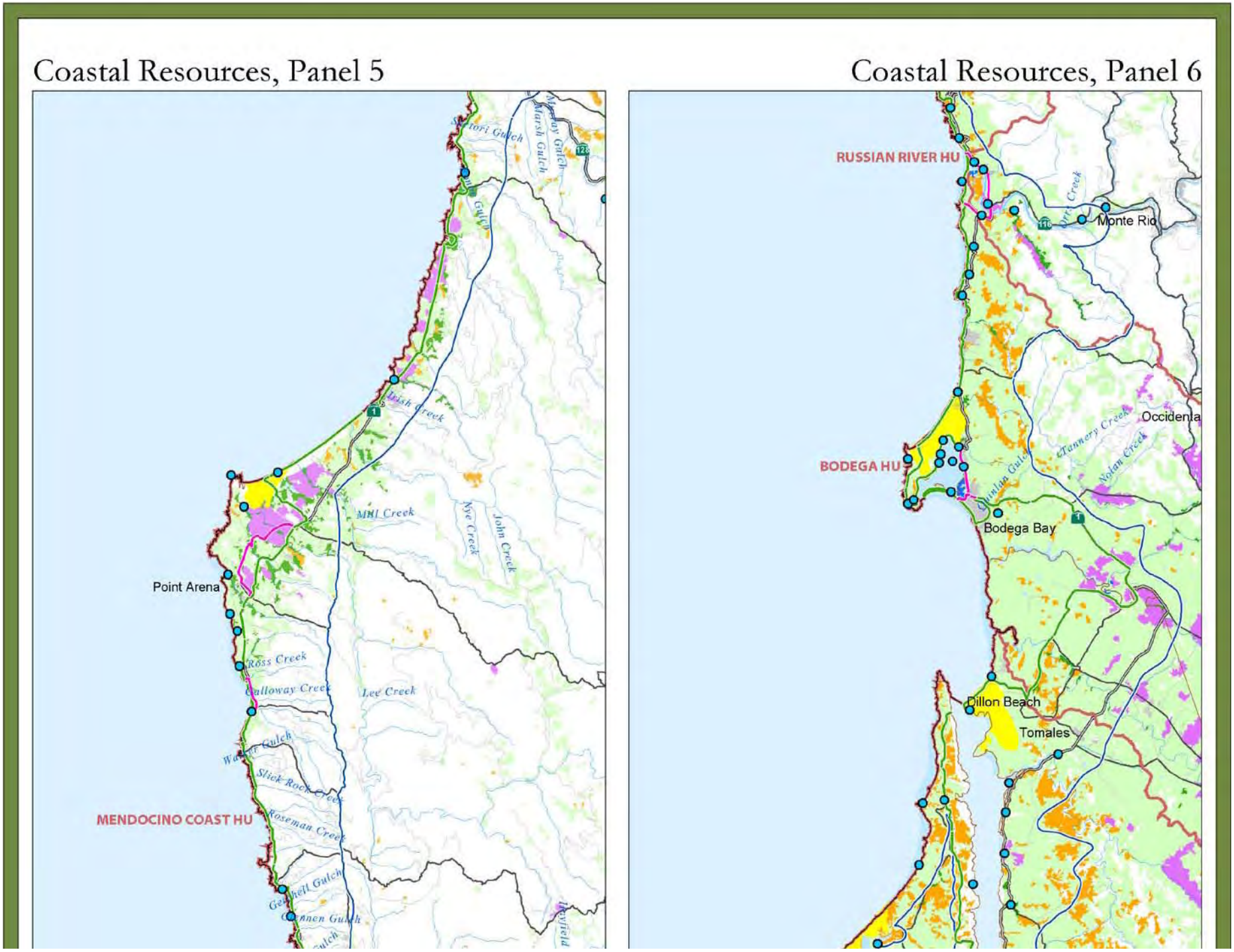
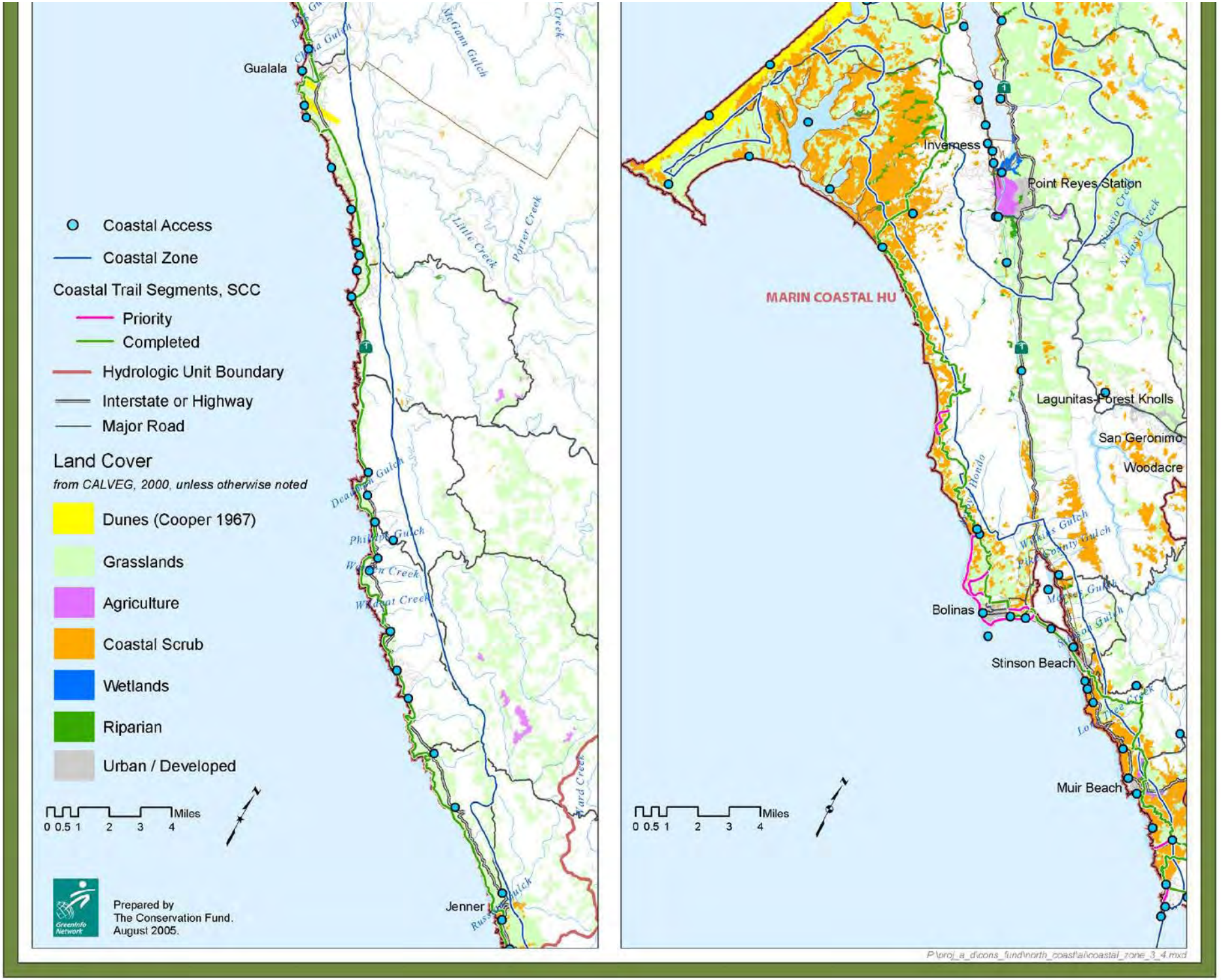
Figure 11: Coastal Resources Map C




Gualala
Inverness
Point Reyes Station
MARIN COASTAL HU
Lagunitas-Forest Knolls
San Geronimo
Woodacre
Bolinas
Stinson Beach
Muir Beach
Jenner
Coastal Access
Coastal Zone
Coastal Trail Segments, SCC
Priority
Completed
Hydrologic Unit Boundary
Interstate or Highway
Major Road
Land Cover
from CALVEG, 2000, unless otherwise noted
Dunes (Cooper 1967)
Grasslands
Agriculture
Coastal Scrub
Wetlands
Riparian
Urban / Developed
0 0.5 1 2 3 4 Miles
Prepared by
The Conservation Fund.
August 2005.
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Appendix 3:
Contact List,
North Coast Conservation Groups

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
Albion River Watershed Protection Association	Linda Perkins	707-937-0903	PO Box 661, Albion CA 95410	Albion River / Salmon Creek (Mendocino County)	Watershed preservation, forestry
American Bird Conservancy	Bob Altman, Pacific NW Coordinator	541 745-5339	311 NE Mistletoe Corvallis, OR 97330 baltman@abcbirds.org	Northern Pacific Rainforest, Nationwide	Bird conservation
Anderson Valley Land Trust	Karen Altaras	707-895-3150	PO Box 141, Boonville, CA 95415 avlt@mcn.org	Anderson Valley, Mendocino County	Conservation, restoration
Ancient Forest International 923-3015 Rick Klein: 707-923-3015 PO Box 1850 Redway, CA 95560	Rick Klein	707-923-3015	PO Box 1850, Redway CA 95560 www.ancientforests.org afi@ancientforests.org		
Audubon Society, Mendocino Coast	Warren Wade, Pres.	707-937-6362	14233 Hanson Circle, Fort Bragg, CA 95437	Mendocino Coast	Bird conservation
Audubon Society, Redwood Region	Jim Clark	704-826-7031	PO Box 1054, Eureka, CA 95502 www.rras.org	Humboldt and Del Norte	Conservation, restoration
Bureau of Land Management (BLM)	Rick Hanks, National Monuments Manager	831-372-6105	299 Foam St., Monterey, CA 93940	California	
CA Biomass Energy Alliance		916-444-8333	1330 21st St., Suite 201 Sacramento, CA 95814	California	Watershed conservation, restoration
CA Board of Forestry and Fire Protection	Stan L. Dixon, Chair, Board of Trustees	916-653-8007	PO Box 944246 Sacramento, CA 94244	California	Forestry and fire protection
CA Coastal Commission	General information	415-904-5260	45 Fremont St., Suite 2000 San Francisco, CA 94105	California	Planning, enforcing the Coastal Act of '76

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
CA Coastal Conservancy	Karyn Gear, North Coast Program Mgr.	510-286-4171	1330 Broadway, 11th Floor, Oakland CA 94162	North Coast, Coastal Zone & Watersheds	Conservation / Restoration / Public Access
CA Dept. of Conservation	Debbie Sareeram, Deputy Director	916-322-1080	801 K St., MS 24-01 Sacramento, CA 95814	California	Information / Services re: CA's Natural Resources
CA Dept. of Fish and Game	Don Koch, Regional Manager: (530) 225-2363 Peggy Mattingly, Secretary: (530) 225-2360	Public Information: (530) 225-2300	North Coast (Region 1) Headquarters: 601 Locust Street Redding, CA 96001	California, North Coast	Conservation / Restoration
CA Dept. of Forestry and Fire Protection	Humboldt-Del Norte Unit Unit Chief Tom Osipowich Mendocino Unit Unit Chief Loyde Johnson Sonoma-Lake-Napa Unit Unit Chief Ernie Loveless	(707) 725-4413 (707) 459-7414 (707) 967-1400	118 Fortuna Boulevard Fortuna CA 95540-0425 17501 North Hwy. 101 Willits CA 95490 1199 Big Tree Road St. Helena CA 94574-9711	California	Forestry & Fire Protection
CA Dept. of Parks and Recreation	Northern Division Chief, Lynn Rhodes	(916) 657-4042 Public Information Inquiries: 800-777-0369 or 916-653-6995	Dept. of Parksand Recreation 1416 9th Street Sacramento, CA 95814 P.O. Box 942896 Sacramento, CA 94296 info@parks.ca.gov	Northern California	Conservation / Restoration / Recreation
CA Dept. of Parks and Recreation, Mendocino District	Mike Wells, Superintendent	707-937-5804	PO Box 440, Mendocino CA 95460	Mendocino District	Conservation / Restoration / Recreation

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
CA Dept. of Parks and Recreation, North Bay District	Steve Horvitz	707) 445-6547	P.O. Box 2006 3431 Fort Ave. Eureka, CA 95502-2006	Humboldt, Del Norte	Conservation / Restoration / Recreation
CA Dept. of Parks and Recreation, North Bay District	Joseph P. Mette, Superintendant	707) 865-2391	C / O Russian River Sector 25381 Steelhead Blvd. Duncan Mills, CA 95430	North Bay Area, Marin, Sonoma	Conservation / Restoration / Recreation
CA Native Plant Society	Jon Thompson, Pres.	707-882-1655 (Lori Hubbard)	PO Box 577, Gualala CA 95445	Coastal belt–Mendo & N. Sonoma	Preservation, Restoration, Education
CA Ocean Sanctuary	Gerri Morse	707-964-1530	14073 Pt. Cabrillo Dr., Mendocino CA 95460	Coastal	Conservation
CA State Lands Commission	William V. Morrision, Legislative Liaison	916-574-1800	100 Howe Ave., Ste 100 S Sacramento, CA 95825	California	Regulates tidelands up to 3 miles off-shore
CA Wilderness Coalition		(510) 451-1450	1212 Broadway, Suite 1700 Oakland, CA 94612 Email: info@calwild.org www.cal-wild.org	Statewide	Wilderness Protection
Campaign to Restore Jackson State Forest	Vince Taylor, E.D.	707-964-5800	POB 1789, Fort Bragg, 95437	JDSF	Conservation, resto-ration, public access
Coast Action Group	Alan Levine	707-882-2484	PO Box 215, Pt. Arena, CA 95468	Mendocino County	Conservation, restoration
Coastal Land Trust	Rixanne Wehren, Dir.	707-937-2709	P.O.Box 340, Albion CA 95410	Coastal Mendocino	Public Access
Community Wilderness Alliance	Lynn Ryan	707-822-6918	575 H St., Arcata, CA 95521		
Conservation Alliance	Ron Nadeau	707-961-0165	16550 Franklin Rd., Fort Bragg, CA 95437	Mendocino County	Preservation / Acquisition

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
Cummings Creek Watershed Advisory Council	Ken Jorgenson	768-3336	PO Box 21, Carlotta CA 95528	Cummings Creek	
Eel River Salmon Restoration Project	Bill Eastwood	707-923-9109	PO Box 424, Redway CA 95560	Eel River Watershed	
Eel River Watershed Improvement Group	Ruth Goodfield	707-923-5227	1500 Alamar Way, Fortuna, CA 95540	Eel River Watershed	
Eel River Watershed Protection and Restoration Assoc.	John Harnish	707-743-2642	PO Box 337, Potter Valley CA 95469	Upper Eel River Watershed	Conservation
Environmental Protection Information Center (EPIC)	Cynthia Elkins; Diane Griffith	707-923-2931	PO Box 397, Garberville CA 95442		
Forest Advisory Committee	Mendocino County Supervisors' Appointees	707-463-4221	501 Low Gap Rd., Ukiah, CA 95482	Mendocino County	Foresty
Forests Forever		415-974-3636 mail@ forestsforever.org	50 First Street, Suite 401, San Francisco, CA 94105 http://www.forests forever.org/		
Friends of Big River	Linda Perkins	707-937-0903	PO Box 661, Albion CA 95410	Albion River / Salmon Creek	Watershed Preservation, Forestry
Friends of the Eel River	Steve Evans; Nadananda	707-923-2146	PO Box 2305, Redway CA 95560	Eel River	
Friends of Enchanted Meadow	Rixanne Wehren	707-937-2709	P.O.Box 340, Albion 95410	Albion River / Salmon Creek	Conservation

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
Friends of the Dunes	Carol Vander Meer	415-974-3636 mail@ forestsforever.org	PO Box 186, Arcata, CA 95518 www.friendsofthedunes.org	Humboldt County	
Friends of the Garcia River	John Hooper, Pres.	707-882-3046	HoopArb@aol.com	Garcia River Watershed	Restoration / Protection / Monitoring
Friends of the Gualala River	Tom Cochrane, Pres.	707-785-3431	PO Box 1543, Gualala 95445	Gualala	Conservation
Friends of the Navarro Watershed	Steve Hall	707-895-2735	PO Box 861, Boonville CA 95415	Navarro River	Appropriations / Litigation / Watchdog / Riparian Habitat
Friends of Schooner Gulch	Peter Reimuller	707-882-2001	PO Box 4, Pt. Arena CA 95468	Schooner Gulch	
Friends of the Ten Mile	Judith Vidaver	707-964-2742	P.O.Box 2330, Fort Bragg CA 95437	Ten Mile River	Public Access / Preservation
Friends of the V an Duzen	Sal Steinberg	707-768-3189	PO Box 274, Carlotta CA 95528	Van Duzen Watershed	
Garcia River Watershed Advisory Council	Craig Bell, Garcia River Watershed Coordinator	707-884-3012	P. O. Box 1256, Gualala, CA 95445 acenlil@mcn.org	Garcia River Watershed	Restoration, fisheries
GreenInfo Network (GIS)	Larry Orman Maegan Leslie	415-979-0343	www.greeninfo.org	Statewide	GIS services
Greenwood Watershed Association	Mary Pjerrou, Dir.	707-877-3405	P.O.Box 106, Elk 95432	Greenwood Creek / Elk Creek	Restoration
Gualala River Steelhead Project	Gregg Warner	707-884-4322	PO Box 266, Gualala CA 95445	Gualala River	
Humboldt County Resource Conservation District	curtisihle@yahoo.com	(707) 442-6058	5630 South Broadway, Eureka, CA 95503	Humboldt County	Resource conservation

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
Humboldt Northcoast Land Trust	Ned Simmons	707-677-0716	PO Box 1233, Trinidad, CA 95570		
Humboldt Watershed Council	Bob Wunner	707-822-7372	1640 Union St., Arcata CA 95521		
Institute for Sustainable Forestry	Judy Wait	707-247-1101	PO Box 1580, Redway		Forestry
InterTribal Sinkyone Wilderness Council	Hawk Rosales, E.D.	707-463-6745	PO Box 1523, Ukiah 95482	Sinkyone	
Jacoby Creek Land Trust	Susie	707-822-6066	PO Box 33, Bayside, CA 95524		
Klamath Resource Information Systems (KRIS)	Pat Higgins	707-822-9428	791 Eighth Street, Suite N, Arcata, CA 95521 phiggins@humboldt1.com	North Coast	Conservation / Natural Resource Database www.kris.com
Legacy Project, CA Resources Agency	Mark Hoshovsky (Interim Project Director, DFG Sr. Biologist, HCP Branch)	(916) 653-5656	Resources Agency 1416 Ninth Street Suite 1311 Sacramento, CA 95814	Statewide	Statewide conservation information collection / Dissemination; conservation strategy development
Legacy The Landscape Connection	Curtis Jacoby, Ex. Dir. Greg Bourget	707-826-9408	PO Box 59, Arcata CA 95518	North Coast	Conservation, GIS
Marin Agricultural Land Trust (MALT)	Robert Berner, Exec. Dir.	(415) 663-1158	P.O. Box 809, Point Reyes Station, CA 94956	Marin County	Agriculture

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
Marin County Open Space District (MCOSD)	Ron Miska, Assistant General Manager	415) 499-6387	Marin County Civic Center 3501 Civic Center Drive, Room 415 San Rafael, CA 94903 USA rmiska@marin.org	Marin County	Open Space / Greenbelt Conservation
Marin County Resource Conservation District (RCD)	Nancy Scolari	(415) 663-1170	P.O. Box 1146, Point Reyes Station CA 94956	Marin County	Resource c onservation
Mattole Restoration Council	Chris Larson	(707) 629-3514	P.O. Box 160 • Petrolia, CA 95558	Mattole Watershed	Watershed Planning and Restoration
Mattole Salmon Group	Becky Falk	707-629-3433	PO Box 188, Petrolia CA 95558	Mattole	
McKinleyville Land Trust	Dennis Halligan	707-839-5263	PO Box 2723, McKinleyville CA 95519		
Mendocino Coast Environmental Center	Rod Jones	707-937-0709	PO Box 1932, Mendocino 95460	Mendocino Coast	Nonprofit clearinghouse
Mendocino County Resource Conservation District (RCD)	Janet Olave, ED	707-468-9223 ext. 101	405 Orchard Ave, Ukiah	Mendocino County	Resource conservation
Mendocino Environmental Center	Betty Ball	707-468-1660	106 W. Standley, Ukiah 95482	Mendocino Coast	Resource Center re: Environmental Justice
Mendocino CoastWatch	Roanne Withers, Director	707-961-1953	P.O.Box 198, Fort Bragg 95437	Mendocino Coast	Protection / Restoration

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
Mendocino County Forest Advisory Committee (by BOS Appointment)	Henry Gundling: County:	707-895-3781 707-463-4221	PO Box 589, Philo 95466 (Gundling) 501 Low Gap Rd., Ukiah, CA 95482 (County)	Mendocino County	Forestry
Mendocino County ReLeaf	John Phillips	707-459-3015	26010 String Crk Rd,Willits		
Mendocino Land Trust	James Bernard, E.D.	707-962-0470	PO Box 1094, Mendocino CA 95460	Mendocino County	Conservation, Restoration, Education, Public Access, Working Landscapes
Mendocino Watershed Service	Craig Bell	707-884-3012	PO Box 1256, Gualala, CA 95445		
Middle Mattole Conservancy	Gabrielle Roach	707-223-0044	PO Box 73, Honeydew, CA 95545	Mattole	
Mill Creek Watershed Conservancy		707-629-3521	PO Box 173, Petrolia, CA 95558 Petrolia 95558	Mill Creek	
National Fish & Wildlife Foundation	Claire Thorp, Director, SW Region	415-778-0999	28 Second St., SF CA 94105	Nationwide	Conservation, Restoration, Education
Natural Resources Service	Ruth Blyther	707-269-2066	904 G Street, Eureka, CA 95501		
New Growth Forestry	Meca Wawona	707-462-2114	PO Box 206, Ukiah		Forestry
North Coast Environmental Center	Tim McKay	707-822-6918	575 H Street, Arcata CA 95521		
North Coast Environmental Defense Center	Kimberly Burr, Esq	707-887-7433	PO Box 1246, Forestville		

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
North Coast Regional Land Trust	Maya Conrad, Ex. Dir. Shane Green, projects manager	707-882-2617	nrlt@sbcglobal.net s.green@ncrlt.org PO Box 398, Bayside, CA 95524	Humboldt, Del Norte, and Trinity	Land Conservation
Northcoast Salmon Habitat Restoration Group	Bob Anderson		138 S. Whipple, Ft Bragg CA 95437		
Ocean Sanctuary League	Donna Zulim	707-884-3140	PO Box 1214, Gualala CA 95445		
Ocean Sanctuary of Sierra Club Mendo Lake Group	Flo Ann Norvall	707-937-4376	PO Box 930, Mendocino CA 95460		
Pacific Coast Fish, Wildlife, and Wetland Restoration Association	Mitch Farro	707-839-5664	PO Box 4574, Arcata, CA 95518		
Pacific Coast Joint Venture	Ron LeValley California PCJV Coordinator	707-839-0900	www.pcjv.org ron_levalley@pcjv.org		
Pacific Forest Trust	Connie Best, Managing Director	707-578-9950	416 Aviation Blvd, Santa Rosa, CA 95430	Pacific Northwest	Sustainable Forestry
Pacific Rivers Council	David Bayles	707-345-0119 541-345-0119	PO Box 10798, Eugene OR 97440 www.pacrivers.org		
Redwood Coast Land Conservancy	Bill Wiemeyer	707-785-3327	PO Box 1511, Gualala CA 95445	Navarro to Sonoma County Line	Conservation, public access
Redwood Community Action Agency	Stephen Madrone; Ruth Blyther, Dir. Of Natural Resources	707-269-2069	904 G Street, Eureka CA 95501 ruth@rcaa.org	Humboldt, Del Norte	Resource Conservation Planning and Restoration

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
Redwood Coast Watershed Association	Mary Pjerrou, Pr. Dir.	707-877-3405	PO Box 90, Elk CA	Coastal	Conservation / Restoration
Redwood Forest Foundation, Inc.	Don Kemp, Executive Director	707-785-0094	rffi@pacific.net	Redwood region	Sustainable forestry
Resources Law Group, LLP		916.442.4880 (voice)	55 Capitol Mall, Suite 650 Sacramento, CA 95814 http://www.resourceslawgroup.com info@resourceslawgroup.com		
Salmon Forever	Clark Fenton	826-2978	PO Box 3014, McKinleyville CA 95519		
Salmon Restoration Association	Brad Clark, President	415-974-3636 mail@forestsforever.org			Restoration of natural wild salmon runs in N. CA.
Salmonid Restoration Federation	Jud Ellinwood	707-444-8903	PO Box 4260, Arcata, CA 95518		Salmon restoration
Sanctuary Forest	Steve Gibson	707-986-1087	PO Box 166, Whitethorn CA 95589		
Save the-Redwoods League	Ruskin Hartley, Dir. Of Conservation	415-362-2352 ext. 21	114 Sansome Street #605, San Francisco, CA 94104	Redwood region	Conservation, restoration, sustainable forestry, education
Seeley Creek Watershed Association	Georje Holper	707-923-2502	PO Box 433, Redway, CA 95560	Seeley Creek Watershed	
Seventh Generation Fund	Leo Canez	707-825-7640	PO Box 4569, Arcata CA 95518		

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
Sierra Club, Redwood Chapter	Margaret Pennington, Chair penningt@sonic.net (707) 829-2294	707-544-7651	P.O. Box 466 Santa Rosa, CA 95402 http://www.redwood.sierraclub.org/chapter/contact.html	Redwood region	Explore, enjoy, protect the planet
Smith River Alliance	Grant D. Werschkull, Executive Director	(916) 485-6662	PO Box 2129 | Crescent City, CA 95531 http://www.smithriveralliance.org/	Smith River Watershed	Smith River protection, restoration, stewardship
Sonoma County Agriculture and Open Space District (SCAOSD)	Andrea Mackenzie, 0General Manager		747 Mendocino Ave Ste 100, Santa Rosa, CA 95401	Sonoma County	Agriculture, open space
Sonoma Land Trust	Aimee Carroll	707-526-6930 ext. 102	966 Sonoma Ave, Santa Rosa, CA 95404	Sonoma County	Conservation; public access
Sonomoa County RCD (Sotoyome)	Kerry Williams	(707)569-1448	PO Box 11526, Santa Rosa, Ca 95406,	Sonoma County	Resource conservation
South Fork Trinity River Land Conservancy	David Rose	707-574-1077	PO Box 36, Mad River, CA 95552		
Surfrider Foundation North Coast Chapter	Eric Austensen	707-824-0435			
Ten Mile River Watershed Association	Judith Vidaver		PO Box 25, Ft Bragg CA 95437		
The Buckeye Conservancy	Andy Westfall	707-443-5688	PO Box 5607, Eureka CA 95502		
The Conservation Fund	Chris Kelly, CA Director	415-927-2123	PO Box 5326, Larkspur, CA 94977 www.conservationfund.org	Nationwide organization; California Program	Conservation, restoration, sustainable forestry

Organization	Contact	Phone No.	Mailing Address	Zone	Focus
The Nature Conservancy	Wendy Millet, North Coast Program Manager	415-777-0487	201 Mission St., 4th Floor SF CA 94105	Nationwide organization; North Coast Ecoregion	Conservation
Tomales Bay Watershed Council	Neysa King - Watershed Coordinator		PO Box 447, Point Reyes Station, CA 94956	Marin County	Watershed conservation
Trees Foundation	Barbara	707-923-4377	PO Box 2202, Redway, CA 95560		
US Forest Capital	Joseph Euphrat	415-945-0808	770 Tamalpais Dr., Ste 310 Corte Madera, CA 94925	State	Forest Investment Services Company
Wildlife Conservation Board	Al Wright, Exec. Dir	916-445-1082	1807 13th St., Suite 103, Sacramento CA 95814	State	Conservation / Restoration

Appendix 4: GIS Data Sources

Mapping Data Sources:

- "Public Land" from California Legacy Program, 2005
- "Large Forestland Ownership" from various sources (see GreenInfo Network for detail)
- "Coastal Access" from California State Coastal Conservancy, 2003
- "Coastal Trail" from California State Coastal Commission, 2002
- "Wetlands," "Agriculture Lands," and "Dunes" from CalVeg (CDF) 2000, and Cooper 1967
- "Hydrologic Units" from CalWater 2.2 (California Department of Fish and Game)
- "Streams" from National Hydrology Dataset, 2005 (US Geologic Survey and EPA)
- "Highways" and "major roads" from CalTrans
- "Urban areas" from Farmland Mapping and Monitoring Program, 2002 (California Department of Conservation).

Endnotes

1 Hydrologic Units are geographic areas defined under the California Interagency Watershed Map of 1999 (CalWater 2.2) and adopted by the State of California as working definitions of watershed boundaries. The CalWater system divides the State into ten Hydrologic Regions, then progressively subdivides it into smaller, nested levels beginning with Hydrologic Units (HUs), which are based on major rivers and are generally 40,000 – 50,000 acres or less. Not a "pure" watershed map, some of the boundaries reflect legal, political or administrative considerations rather than actual drainage divides. The study area includes thirteen HUs.

2 While the HUs summarized in Part 2 are all ecologically related to the North Coast through their respective river and stream systems, these Units are much larger than what is generally considered as having a significant direct impact on coastal resources. The analysis in this part therefore focuses on the portions of the study area with direct impact to coastal resources.

3 For the purpose of this recommendation, "large," "strategically-located" properties are those that (1) are large enough to stabilize land use in the region by having a substantial positive effect on the viability of sustainable, resource-based economic activities on surrounding lands, (2) are located where they provide a bulwark against the spread of incompatible land uses, (3) provide opportunities for large-scale protection and restoration of high priority aquatic and terrestrial resources (such as coho salmon refugia), (4) provide landscape connection to other important conservation lands and, (5) are themselves large enough to be economically self-sufficient.

4 At the time the Catalogue was completed (October 2004), eleven planning efforts were known to be in progress but were not yet available for review. These are included in the Catalogue (all noted as "ongoing") but for obvious reasons could not be included as candidates for the final synthesis. Additionally, the following two planning efforts in Humboldt and Del Norte Counties were under way but are not yet available, and are therefore not included in the Catalogue: 1) TNC's "Eyfromson Workshop" and 2) further regional conservation planning by the North Coast Regional Land Trust and Save-the-Redwoods League, as follow-up to the Eyfromson Workshop.

5 While developing the catalogue of existing conservation plans, contact information on over 100 conservation groups, agencies, and organizations throughout the region was collected (see Contact List, Appendix 3).

6 Rubrics are scoring guides, usually numerical, used in subjective assessments that allow for standardized evaluation according to specified criteria.

7 The information presented in each of these summaries reflects what was reported in the plans that were used for the synthesis for that particular unit. We did not add any information that was not contained in the selected plans, nor did we determine the accuracy of the findings and recommendations they contained.

8 For example, NCWAP data on THPs was only completed for three watersheds, with a level of detail too high for incorporation within this analysis.

9 California Interagency Watershed Map of 1999 (CalWater 2.2.1) is the State of California's working definition of watershed boundaries. For more information, see http://casil-mirror1.ceres.ca.gov/casil/gis.ca.gov/calwater/

10 Given the small area of the Winchuck HU, it has been aggregated with the discussion of the Smith River HU.

11 The Nature Conservancy, California, *California North Coast Ecoregion Aquatic Conservation Strategy*

Recommendations, 2003; Save-the-Redwoods League, *North Coastal California: A Stewardship Report,* 2001.

12 Ecotypes derived from Calveg and GAP classifications. **Note:** TNC's Ecoregional Plan identifies over 30 priority communities in the Smith River HU.

13 *Winchuck River Watershed Action Plan,* Winchuck River Watershed Council, 2001. Available online at: www.currywatersheds.org/1winchuck_rv.shtml.

14 The Nature Conservancy, California, *California North Coast Ecoregional Plan,* June 2001. Statistics from Smith River portfolio sites.

15 Andrea Pickart and John O. Sawyer, *Ecology and Restoration of N. California Dunes*. California Native Plant Society, 1998.

16 *Pacific Coast Joint Venture, Strategic Plan Update 2004;* The Nature Conservancy, California, *California North Coast Ecoregional Plan,* Op. Cit.; Department of Fish and Game, Lake Earl Management Plan, 2003.

17 North Coast Chapter of the California Native Plant Society, http://www.northcoast.com/~cnps/lss-miriv.htm; Save-the-Redwoods League, *North Coastal California: A Stewardship Report*, 2001, page B2.

18 National Forest Service, *Six Rivers National Forest Land Management Plan,* 2001.

19 Department of Fish and Game, *Recovery Strategy for California Coho Salmon,* 2004.

20 Notes: The Nature Conservancy ranks its portfolio sites on private forest lands in the Smith as "highly threatened," pp 37-38; *Trust for Public Land's The State of California Rivers* (2001) lists logging as the single major threat to the Smith River.

21 Winchuck River Watershed Action Plan, Op. Cit.

22 Ibid.

23 Pacific Coast Joint Venture, Op. Cit.; Smith River Project website.

24 *Calfish Passage Assessment Database,* August 2004, available online at www.calfish.org.

25 Save–the-Redwoods League, Op. Cit.

26 Department of Fish and Game, Op. Cit., 6.2- 6.13

27 Note: except where otherwise noted, these recommendations are from the *Draft Pacific Coast Joint Venture Strategic Plan Update,* 2004.

28 Pacific Coast Joint Venture, Op. Cit.; The Nature Conservancy, *California North Coast Ecoregion Aquatic Conservation Strategy Recommendations,* Op. Cit.

29 State Coastal Conservancy, *Completing the California Coastal Trail,* 2003; Save-the-Redwoods League, Op. Cit.

30 The most current Calfish Passage Assessment Database may update this gap; however, source information (published prior to the current Database) noted it as a gap. The same is true for other HU summaries.

31 The Nature Conservancy, California, *California North Coast Ecoregion Aquatic Conservation Strategy Recommendations,* Op. Cit.

32 Department of Fish and Game, Op. Cit., 6.2- 6.13.

33 Note: ecotypes derived from Multi-Source Land Cover Database classifications, with specialized communities from TNC portfolio site statistics and the California Natural Diversity Database.

34 Rare (Ron LeValley, July 2005, personal communication).

35 *Pacific Coast Joint Venture,* Op. Cit.

36 Ibid.

37 Department of Fish and Game, Op. Cit., 6-15.

38 The Nature Conservancy, California, *California North Coast Ecoregion Aquatic Conservation Strategy Recommendations,* Op. Cit.

39 Department of Fish and Game, Op. Cit.

40 Ibid, pp 6-15.

41 Save-the-Redwoods League, Op. Cit.

42 Ibid.

43 Department of Fish and Game, Op. Cit., pp 6.2- 6.13.

44 Note: except where otherwise noted, these recommendations are from the *Pacific Coast Joint Venture's Strategic Plan Update,* 2004.

45 Department of Fish and Game, Op. Cit.

46 Note: except where otherwise noted, these recommendations are from *Completing the California Coastal Trail,* Coastal Conservancy, Op. Cit.

47 Note: land cover types derived from Multi-Source Land Cover Database classifications.

48 The Nature Conservancy, *California North Coast Ecoregion Aquatic Conservation Strategy Recommendations,* Op. Cit.

49 *Pacific Coast Joint Venture,* Op. Cit.

50 Save-the-Redwoods League, Op. Cit.

51 Department of Fish and Game, Op. Cit., pp 6.1.9.

52 Ibid.

53 Ibid.

54 Ibid, pp 6.2- 6.13.

55 Note: except where otherwise noted, these recommendations are from the *Pacific Coast Joint Venture's Strategic Plan Update,* 2004.

56 Note: except where otherwise noted, these recommendations are from the *Coastal Conservancy report, Completing the California Coastal Trail,* Op. Cit.

57 Department of Fish and Game, Op. Cit.

58 Save-the-Redwoods League, Op. Cit.

59 Note: ecotypes derived from Multi-Source Land Cover Database classifications, with specialized communities from TNC California's North Coast Ecoregional Plan portfolio site statistics and CNDDB.

60 TNC portfolio site statistics and CNDDB.

61 Note: bird use days are a measure of the total number of days of use by all individuals, i.e. 150 birds using a site for one day equals 150 bird use days.

62 *Pacific Coast Joint Venture,* Op. Cit.

63 *Pacific Coast Joint Venture,* Op. Cit.

64 Ibid.

65 Cooper, William, *Coastal Dunes of California,* 1967.

66 *Pacific Coast Joint Venture,* Op. Cit.

67 Ron LeValley, personal communication, July 2005.

68 Department of Fish and Game, Op. Cit.

69 Ibid.

70 *Pacific Coast Joint Venture,* Op. Cit.

71 Department of Fish and Game, Op. Cit., 6.2- 6.13.

72 Note: except where otherwise noted, these recommendations are from *Pacific Coast Joint Venture,* Op. Cit.

73 Note: except where otherwise noted, these recommendations are from the Coastal Conservancy report, *Completing the California Coastal Trail,* Op. Cit.

74 Note: ecotypes are derived from Multi-Source Land Cover Database classifications, with specialized communities from TNC California North Coast Ecoregional Plan portfolio site statistics and CNDDB.

75 TNC portfolio site statistics and CNDDB.

76 Pacific Coast Joint Venture, Op. Cit.

77 Department of Fish and Game, Op. Cit.

78 TNC's North Coast Ecoregional Plan, Op.Cit.

79 Department of Fish and Game, Op. Cit., 6.2- 6.13.

80 Note: except where otherwise noted, these recommendations are from *Pacific Coast Joint Venture,* Op. Cit.

81 Note: except where otherwise noted, these recommendations are from the Coastal Conservancy report, *Completing the California Coastal Trail,* Op. Cit.

82 Note: After San Francisco Bay. *Pacific Coast Joint Venture,* Op. Cit.

83 Note: Ecotypes derived from Multi-Source Land Cover Database classifications.

84 Save-the-Redwoods League, Op. Cit.

85 From CNDDB and TNC's North Coast Ecoregional Plan (statistics for Eureka Plain portfolio sites).

86 *Pacific Coast Joint Venture,* Op. Cit.

87 Ibid.

88 Ibid.

89 Pickart and Sawyer, *Ecology and Restoration of Northern California Coastal Dunes,* 1998 .

90 Save-the-Redwoods League, Op. Cit.

91 Pickart and Sawyer, Op. Cit.

92 Department of Fish and Game, Op. Cit.

93 Save-the-Redwoods League, Op. Cit.

94 From TNC's North Coast Ecoregional Plan, Op. Cit.

95 Except where otherwise noted, these recommendations come from DFG's Recovery Strategy.

96 Department of Fish and Game, Op. Cit., 6.2- 6.13.

97 Note: except where otherwise noted, these recommendations are from *Pacific Coast Joint Venture,* Op. Cit.

98 Note: except where otherwise noted, these recommendations are from the Coastal Conservancy report,

Completing the California Coastal Trail, Op. Cit.

99 Note: acreages are as follows. Mainstem: 945,280 acres (1,477 mi2); North Fork: 181,120 acres (283 mi2); Middle Fork: 481,920 acres (753 mi2); South Fork: 441,600 acres (690 mi2); Van Duzen: 273,920 acres (428 mi2). From Department of Fish and Game, Op. Cit.

100 Note: ecotypes derived from Multi-Source Land Cover Database classifications, with specialized communities from TNC's North Coast Ecoregional Plan portfolio site statistics and CNDDB.

101 There are records of only one or two sightings, making this a vagrant (Ron LeValley, personal communications, July 2005).

102 Save-the-Redwoods League, Op. Cit.

103 TNC's North Coast Ecoregional Plan portfolio site statistics and CNDDB.

104 Save-the-Redwoods League, Op. Cit.

105 *Pacific Coast Joint Venture,* Op. Cit.

106 The Nature Conservancy, *North Coast Ecoregion Aquatic Conservation Strategy Recommendations,* Op. Cit.

107 Note: coho salmon were once present in the North Fork Eel River and its tributary Bluff Creek, as well as in the Middle Fork Eel River and its tributaries Rattlesnake, Mill, Grist, and Rock creeks. Coho salmon in the North Fork and Middle Fork Eel are now believed to be extirpated. Department of Fish and Game, Op. Cit.

108 Department of Fish and Game, Op. Cit., *Pacific Coast Joint Venture,* Op. Cit.

109 *Pacific Coast Joint Venture,* Op. Cit.

110 Department of Fish and Game, Op. Cit.

111 Ibid.

112 Save-the-Redwoods League, Op. Cit.

113 Note: TNC's North Coast Ecoregional Plan, pg 37-38, ranks portfolio sites on private forest lands in the Smith as "highly threatened." The Trust for Public Land's State of California Rivers lists logging as the single major threat to the Smith River.

114 Department of Fish and Game, Op. Cit., 6.2- 6.13.

115 Note: except where otherwise noted, these recommendations are from *Pacific Coast Joint Venture,* Op. Cit.

116 Note: except where otherwise noted, these recommendations are from the State Coastal Conservancy report, *Completing the California Coastal Trail,* Op. Cit.

117 Department of Fish and Game, Op. Cit.

118 Note: private homesteaders own a large number of subdivided parcels formerly held by timber companies, and most parcels are 20 to 160 acres in size (Save-the-Redwoods League, Op. Cit.).

119 Department of Fish and Game, Op. Cit.

120 Note: ecotypes derived from Multi-Source Land Cover Database classifications, with specialized communities from TNC's North Coast Ecoregional Plan portfolio site statistics and CNDDB.

121 Rarely present historically at the mouth of the Mattole (personal communcation, Ron LeValley, July 2005).

122 The Nature Conservancy, *California North Coast Ecoregion Aquatic Conservation Strategy Recommendations,* Op. Cit., and CNDDB.

123 Save-the-Redwoods League, Op. Cit.

124 TNC's North Coast Aquatics Recommendations and CNDDB.

125 Note: remaining resource descriptions cited from Save-the-Redwoods League, Op. Cit.

126 Department of Fish and Game, Op. Cit.

127 Save-the-Redwoods League, Op. Cit.

128 Ibid.

129 Department of Fish and Game, Op. Cit., 6.2- 6.13.

130 Note: except where otherwise noted, these recommendations are from Pacific Coast Joint Venture, Op. Cit.

131 Note: except where otherwise noted, these recommendations are from the Coastal Conservancy report, *Completing the California Coastal Trail,* Op. Cit.

132 From CNDDB, as cited in *Mendocino Land Trust's Mendocino County Coastal Conservation Plan,* 2003.

133 Mendocino Land Trust, Op. Cit.

134 CNDDB.

135 TNC Ecoregional Plan portfolio site statistics and CNDDB.

136 Mendocino Land Trust, Op. Cit.

137 Mendocino Land Trust, Op. Cit.

138 Pickart and Sawyer, Op. Cit.

139 *Pacific Coast Joint Venture,* Op. Cit.

140 Ibid.

141 Note: significant offshore rocks and onshore rocky areas occur throughout the study area, but were specifically referenced in only one of the selected plans—thus their mention here and not elsewhere.

142 Mendocino Land Trust, Op. Cit. Prime agricultural lands have highly productive soils that have been determined worthy of permanent protection by federal and state resource agencies.

143 From Mendocino Land Trust, Op. Cit., unless otherwise noted.

144 Department of Fish and Game, Op. Cit.

145 Information on the effort, known as the North Coast Coho Project, may be found at http://www.tucalifornia.org/nccoho-proj.htm

146 Unless otherwise noted, these are from Department of Fish and Game, Op. Cit., 6.2- 6.13.

147 Mendocino Land Trust, Op. Cit.

148 Ibid

149 Note: except where otherwise noted, these recommendations are from Pacific Coast Joint Venture, Op. Cit.

150 Mendocino Land Trust, Op.Cit.

151 Ibid

152 Ibid

153 Note: except where otherwise noted, these recommendations are from the Coastal Conservancy report, *Completing the California Coastal Trail,* Op. Cit.

154 Note: the results of required biological, cultural, and geological surveys will also dictate trail routes.

155 Mendocino Land Trust, Op. Cit.

156 Mendocino Land Trust, Op. Cit.

157 Ibid

158 Ibid

159 Ibid

160 A 200' easement along Caspar Creek connecting Caspar Beach (DPR) and Jackson Demonstration State Forest (CDF) was recorded early in 2005. (Personal communciation, James Bernard, Mendocino Land Trust, July 2005.)

161 Mendocino Land Trust, Op. Cit.

162 Ibid

163 Department of Fish and Game, Op. Cit.

164 Note: Ecotypes derived from Multi-Source Land Cover Database classifications, with specialized communities from TNC California's North Coast Ecoregional Plan portfolio site statistics and CNDDB.

165 The Nature Conservancy, *California North Coast Ecoregion Aquatic Conservation Strategy Recommendations,* Op. Cit.

166 TNC California's North Coast Ecoregional Plan portfolio site statistics and CNDDB.

167 *Pacific Coast Joint Venture,* Op. Cit.

168 Department of Fish and Game, Op. Cit.

169 Department of Fish and Game, Op. Cit., Appendix I, pg 10.

170 Department of Fish and Game, Op. Cit., 6.2- 6.13.

171 Except where otherwise noted, these are from *Pacific Coast Joint Venture,* Op. Cit.

172 Source: Coastal Conservancy report, *Completing the California Coastal Trail,* Op. Cit.

173 Note: ecotypes derived from Multi-Source Land Cover Database classifications, with specialized communities from TNC's North Coast Ecoregional Plan portfolio site statistics and CNDDB.

174 Cooper, Op. Cit.

175 TNC's North Coast Ecoregional Plan portfolio site statistics and CNDDB.

176 *Pacific Coast Joint Venture,* Op. Cit.

177 Department of Fish and Game, Op. Cit.

178 Ibid.

179 Department of Fish and Game, Op. Cit., 6.2- 6.13.

180 Note: except where otherwise noted, these recommendations are from *Pacific Coast Joint Venture,* Op. Cit.

181 Note: except where otherwise noted, these recommendations are from the Coastal Conservancy report, *Completing the California Coastal Trail,* Op. Cit.

182 Department of Fish and Game, Op. Cit.

183 Coastal Conservancy, Op. Cit.

184 Note: ecotypes derived from Multi-Source Land Cover Database classifications.

185 Cooper, Op. Cit.

186 Note: ecotypes derived from Multi-Source Land Cover Database classifications, with specialized com-

munities from TNC's North Coast Ecoregional Plan portfolio site statistics and CNDDB.

187 TNC portfolio site statistics and CNDDB.

188 *Pacific Coast Joint Venture,* Op. Cit.

189 Ibid.

190 Department of Fish and Game, Op. Cit.

191 Department of Fish and Game, Op. Cit., 6.2- 6.13.

192 *Pacific Coast Joint Venture,* Op. Cit.

193 Note: except where otherwise noted, these recommendations are from *Pacific Coast Joint Venture,* Op. Cit.

194 Note: except where otherwise noted, these recommendations are from the Coastal Conservancy report, *Completing the California Coastal Trail,* Op. Cit.

195 These examples are from TNC's Aquatic Recommendations, but examples of the first three were also found in Save-the-Redwoods League's Focal Areas, DFG's Recovery Strategy, Mendocino Land Trust's Coastal Plan, and PCJV's Strategic Plan.

196 These recommendations were found in some form in all plans except the Coastal Trail Report.

197 These recommendations were found in some form in all plans except in the Coastal Conservancy's Coastal Trail.

198 Note that subsurface streams and high temperatures serve as barriers to fish passage; associated recommendations are listed under "Forest Management Recommendations Benefiting Salmonid Species," and many of these also apply to non-forest management areas.

199 As noted in Part 1, this reflects the relative lack of available data on priorities and threats to grasslands and oak woodlands in the existing conservation plans.

200 Furthermore, several of the plans from which the Synthesis Map was prepared do not take into account existing land use, changes in land use or other socio-economic trends that should be evaluated in determining relative priorities for, and the type of, conservation action. See Part 3, which evaluates these factors in the course of deriving regional conservation strategies.

201 While the Hydrologic Units summarized in Part 2 are all ecologically related to the North Coast through their respective river and stream systems, these units are much larger than what is generally considered truly coastal. The analysis in this Part focuses on those portions of the study area with direct impacts to coastal resources.

202 Resources Agency ownership data 2002 (Marin Water District classified as county).

203 Indeed, the largest areas of privately owned forests are in Humboldt and Mendocino Counties. See *Forestry, Forest Industry, and Forest Products Consumption in California,* Laaksonen-Craig and Goldman, UC Davis Publication 8070.

204 California Department of Finance, *2003 Statistical Abstract,* Table G-29.

205 See, *A Comparison of California Forest Practice Rules and Two Forest Certification Systems,* Christopher Dicus and Kenneth Delfino; Cal Poly, April, 2003.

206 California Institute for County Government

207 Michael Coit, "Supply low, demand 'insatiable' for housing," *Press Democrat,* May 2, 2004.

208 The Williamson Act, also called the California Land Conservation Act, of 1965, was created to preserve the maximum amount of a limited supply of prime agricultural land. It provides for qualified property to be incorporated into agricultural preserves through contracts with associated counties, a

designation providing lower property taxes along with development restrictions.

209 See *The Changing California, Forest and Range 2003 Assessment Summary October 2003,* California Department of Forestry and Fire Protection, page 20. The Summary includes the following policy recommendations: "Recognize the continued importance of large scale unfragmented ownerships in the working landscape … Develop analysis of profitability limits at the industry level and examine if state policies can be improved to assure both private and public benefits of large unfragmented holdings." Ibid at 196 (emphasis added).

210 Timber harvests were generally not regulated until the adoption of the Z'berg Njedely Forest Practice Act in 1973.

211 See, also, Dicus and Thompson, *The Impact of California's Changing Environmental Regulations on Timber Harvest Planning Costs,* Institute for the Study of Specialty Crops, California Polytechnic State University, San Luis Obipso. http://cissc.calpoly.edu/research. "Declining returns to investment, couple with mounting regulatory hurdles, create incentives to convert forests to other land uses."

212 See, generally, Jerry F. Franklin and K. Norman Johnson, "Forests Face New Threat: Global Market Changes," *Issues in Science and Technology,* Summer 2004, page 41 et.seq.

213 Ibid, at 44. See also:*The Changing California, Forest and Range 2003 Assessment Summary October 2003,* California Department of Forestry and Fire Protection, page 20. The Summary includes the following policy recommendations: "Recognize the continued importance of large scale unfragmented ownerships in the working landscape … Develop analysis of profitability limits at the industry level and examine if state policies can be improved to assure both private and public benefits of large unfragmented holdings." Ibid at 196 (emphasis added).

214 See, e.g., *Forestry, Forest Industry, and Forest Products Consumption in California,* Laaksonen-Craig and Goldman UC Davis Publication 8070.

215 California State Coastal Conservancy, *Completing the California Coastal Trail,* 2003

216 *The Changing California, Forest and Range 2003 Assessment Summary October 2003,* Op. Cit., page 31.

217 Ibid, page 5.

218 Del Norte County's projected growth rate for the period is 22%, but because of its small population (28,000), it will add the fewest people (6,000).

219 E.g., Humboldt County planning staff has indicated that fragmentation of backcountry ranches is a bigger problem than growth on the urban fringe (personal communication).

220 Note that in June 2005 the California Supreme Court upheld the constitutionality of its board selection process or regulatory reforms to remedy any legal flaws.

221 "New land acquisitions leave State Parks areas closed, unmanaged" *Santa Cruz Sentinel,* May 30, 2004.

222 See, e.g., *Forestry, Forest Industry, and Forest Products Consumption in California,* Laaksonen-Craig and Goldman UC Davis Publication 8070.

223 However, there are some localized areas in the north that are significantly threatened by urban and suburban development, particularly the coastal plains around Crescent City and Humboldt Bay.

224 Recovery Strategy at 7-15 (RW-XXV-B-04)

225 "To address non point source pollution, EPA and the State Water Resources Control Board are promoting innovative watershed approaches involving multiple stake holders to augment traditional regulatory approaches. One mechanism to address both point and non point sources of pollution on a watershed basis is called Total Maximum Daily Load (TMDL). A TMDL is a quantitative assessment of pollution sources, and allocations to reduce pollution levels (U.S. EPA, 1991). TMDLs are required

for water bodies listed as impaired or threatened, in accordance with Section 303(d) of the Clean Water Act (CRWQCB, 1998; 2002a). Elevated levels of sediment and temperature impact spawning and rearing habitat for fish and are considered the principle causes of impairment for North Coast water bodies." TMDL Fact Sheet, KRIS Garcia, See: www.krisweb.com/policy/tmdl.htm.

226 It is important to note that some private companies in the North Coast are adopting forest management practices that seek reasonable commercial economic returns while protecting and restoring habitat for aquatic and terrestrial species and natural communities. The Forest Stewardship Council (FSC) certification, received by Mendocino Redwoods Company and a few small nonindustrial landowners, provides for sustainable forest harvest practices that set higher standards for working forests and habitat protection than those required under the Forest Practice Rules. Incentives and programs to encourage more wide-scale adoption of the FSC standards would also greatly assist with habitat protection on working landscapes throughout the region. In the long run, however, certification alone does not address permanently the threat of eventual fragmentation of ownership or other conversion to non-forest uses.

227 The State Revolving Fund is a low interest loan program established by the Clean Water Act to fund a wide range of water quality projects, including the same types of projects that are eligible for section 319 (h) funding. Traditionally, the SRF and its predecessor, the Clean Water Grant Program, have been used to fund publicly-owned treatment works for sanitary sewer systems. However, the amendments to the CWA that established the SRF allowed for expanded uses of the SRF beyond the traditional POTW project. Capitalization for the SRF comes from an annual federal appropriation, 20 percent of State matching funds and loan repayments that revolve back into the SRF. Current assets (loans and cash) in California exceed $1 billion. The utilization of these assets offers one of the best avenues for funding the implementation of Non Point Source Management Measures and related watershed implementation efforts, many of which can be implemented on forestlands. In June 2005, the State Water Board added to the State Priority List of the SRF a $60,000,000 loan to the Conservation Fund for the purpose of forestland acquisition and implementation of non-point source pollution management measures.

228 Chrisman, Mike, *San Fransisco Chronicle,* "Economic Future Depends on Healthy Environment," Earth Day, April 22, 2004.

229 By contrast, where the principal justification for acquisition of expensive coastal properties is to protect viewsheds or "open space" values, careful consideration should be given to the probable permitted uses under the Coastal Act and local Land Use Plan. Frequently, the little development that is likely permittable may have little impact on such values and acquisition may therefore not be necessary. Similarly, upland properties that do not have unique ecological features such as old growth forest or important landscape connectivity attributes may also not be appropriate for fee or acquisition funding. See, also, *The Redwood Forest, History, Ecology, and Conservation of the Coast Redwoods,* Ed. Reed Noss, Island Press, 2000: "Opportunistic, aesthetic, recreational and other nonbiological approaches to reserve selection virtually guarantees that options to establish reserves will be exhausted before biological elements are adequately represented." Ibid at 203, citing Pressey, et al. 1993; Noss and Cooperrider 1994.

230 See Recover Strategy at page 2.20.

231 Dr. Peter Moyle (personal communication).

232 Many estuarine enhancement plans have already been completed. See, for example, the *Lower Redwood Creek and Estuary Feasibility Study* and the *Lower Klamath Enhancement Project* prepared for the Coastal Conservancy.

233 http://www.mattole.org/about_us/history/index.html

234 California Department of Fish and Game Coho Recovery Strategy recommends "Encourag[ing] continued economically sustainable management of forest … lands in the range of coho salmon to reduce the potential for conversion to residential or commercial development." Recovery Strategy at 7-15 (RW-XXV-B-04).

235 The Recovery Strategy ranks the restoration and management potential for the Hydrologic units within each ESU based on a number of factors, including presence or absence of coho salmon, risk and feasibility of recovery. 5 is the highest possible ranking.

236 See, for example, "Noyo River Total Maximum Daily Load for Sediment" dated December 16, 1999 which recommends implementation measures such as "providing procedures for identifying immediate threats to water quality, especially potential refuge streams, and a means of reducing or eliminating those threats as soon as physically possible" and "control of sediment delivery from road sites … including procedures for inventorying roads, abandoning or obliterating roads, maintaining roads, upgrading roads and building new roads." Ibid at 72.

237 California timberlands contribute significantly to the regional and statewide economy (see e.g., *Forestry, Forest Industry, and Forest Products Consumption in California,* Laaksonen-Craig and Goldman UC Davis Publication 8070).

238 Ibid.