EFFECTS OF COUNTY LAND USE REGULATIONS AND MANAGEMENT ON ANADROMOUS SALMONIDS AND THEIR HABITATS:

HUMBOLDT, DEL NORTE, MENDOCINO, SISKIYOU AND TRINITY COUNTIES, CALIFORNIA

Final Report to the Five County Planning Group
in the North Coast Coho Salmon Transboundary Evolutionarily Significant Unit

University of California Cooperative Extension
November 1998

EFFECTS OF COUNTY LAND USE REGULATIONS AND MANAGEMENT ON ANADROMOUS SALMONIDS AND THEIR HABITATS:

HUMBOLDT, DEL NORTE, MENDOCINO, SISKIYOU AND TRINITY COUNTIES, CALIFORNIA

Final Report to the Five County Planning Group in the North Coast Coho Salmon Transboundary Evolutionarily Significant Unit

November 1998

Richard R. Harris
Extension Forestry Specialist
Environmental Science, Policy, and Management
University of California, Berkeley
Berkeley, CA 94720-3114

Susan D. Kocher
Program Representative
University of California Cooperative Extension
Plumas and Sierra Counties
208 Fairgrounds Road
Quincy, CA 95971

This study was funded in part by a grant from:

Center for Water and Wildland Resources
University of California
1323 Academic Surge
Davis, CA 95616-8750

TABLE OF CONTENTS

PAGE **LIST OF TABLES**

ACKNOWLEDGMENTS

This study was conducted by the University of California. It was neither funded by nor does it necessarily represent the views of the five counties involved. The conclusions presented in this report are the authors' alone. Any real or perceived errors are their sole responsibilities.

This was an extremely demanding assignment and numerous people helped bring it to a successful conclusion. Most are acknowledged below as members of the assessment teams. Special gratitude is due to Mark Lancaster. The end product might have been far different without his insistence on excellence.

The five California counties within the Transboundary ESU and indeed, virtually all rural counties in the Pacific Northwest are facing serious challenges because of the status of anadromous fisheries. Natural resource-dependent local economies have already been severely impacted by other forces such as the listing of the northern spotted owl and the changes in federal policies on National Forest management. The very fact that the counties have responded to this new challenge with a conservation planning effort is remarkable. The authors wish them well in creating a balanced solution that all their residents will be proud of.

Richard Harris and Susie Kocher

ASSESSMENT TEAM

CORE STUDY TEAM

Richard R. Harris, Principal Investigator; and Susan Kocher, Program Representative; University of California, Berkeley
Danny Hagans, Geologist, Pacific Watershed Associates
Sari Sommarstrom, Watershed Planning and Management Consultant, Etna, California (Trinity and Mendocino Counties)
Mark Lancaster, Associate Planner, Trinity County Planning Department

DEL NORTE COUNTY TEAM

Ernest Perry and Diane Mutchie, Del Norte County Community Development Department
Joe Hoke, County Roads Superintendent
Jim Waldvogel and Kim Rodrigues, University of California Cooperative Extension
Tim Viel, Natural Resources Conservation Service

HUMBOLDT COUNTY TEAM

Don Tuttle, Richard Stein, and Harless McKinley, Humboldt County Public Works Department
Kirk Girard and Thomas Hofweber, Humboldt County Planning Department
Jim Waldvogel and Kim Rodrigues

MENDOCINO COUNTY TEAM

Tom Schott, Natural Resources Conservation Service
Weldon Jones, Independent Fisheries Biologist
Diane Chocholak and Dennis Slota, Mendocino County Water Agency
Alan Falleri, Mendocino County Planning Department
Stanley Townsend, Alen Gialdini, Doug Ellinger and Granville Pool, Mendocino County Department of Transportation
Don Wegner, Russian River Flood Control District

SISKIYOU COUNTY TEAM

Rick Barnum and Wayne Viraq, Siskiyou County Planning Department
Brian McDermott and Don Howell, Siskiyou County Public Works Department
Dan Drake, University of California Cooperative Extension
Randy Seelbreed and Tim Viel, Natural Resources Conservation Service

TRINITY COUNTY TEAM

John Jelicich and Colleen O'Sullivan, Trinity County Planning Department
Fritz Oberst, Trinity County Public Works Department
William Brock, US Bureau of Reclamation
Larry Forero, University of California Cooperative Extension
Randy Seelbreed and Charlie Diehl, Natural Resources Conservation Service

INTRODUCTION

Five counties in northern California-Humboldt, Del Norte, Siskiyou, Trinity and Mendocino-have joined together in a unique conservation planning project. These five counties are within the "Transboundary Evolutionarily Significant Unit (ESU)" for the threatened coho salmon. Being so, land use and development activities occurring within them could be subject to constraint due to the federal Endangered Species Act. Soon after the listing of the coho salmon, elected supervisors from the five counties met and concluded that the economies of the counties were at stake unless they developed a conservation plan that would meet the requirements of the National Marine Fisheries Service. A memorandum of understanding was developed to formally join the counties for the purposes of evaluating strategies for protecting anadromous fish and their habitats while minimizing disruptive impacts on local land uses and economies. The result is the ongoing five county salmon conservation planning effort.

The counties' planning effort has five goals:

1. Protect Threatened and Endangered species while preserving private property rights and minimizing project delays.

2. Use existing regulatory controls to protect existing habitat for discretionary projects until specific plans are implemented.

3. Restore coho salmon habitat by cooperatively working with Resource Conservation Districts, Natural Resource Conservation Service, USDA-Forest Service and/or other federal and state agencies, groups, companies and individuals as appropriate.

4. Develop or use existing land use, property tax and/or state incentives to encourage private landowners to protect and/or restore habitat.

5. Develop a comprehensive plan and conservation measures to allow counties to issue incidental take permits for coho and all other anadromous salmonids.

Under the terms of a pre-existing contract, the five county steering committee requested the services of the University of California, Berkeley, Cooperative Extension. The role of the University was to perform an assessment of land use management in the five county study area. This assessment included: 1) review of all relevant adopted land use policies and regulations within the five counties; 2) review of a sample of land development case studies and: 3) evaluation of a number of development and maintenance activities by interdisciplinary field teams.

Field team members were selected on the basis of familiarity with the specific county and expertise in relevant disciplines (planning, engineering, watershed science, fisheries).

The results of the University's study are reported here. This report is accompanied by a separate Executive Summary and four appendices. This study will be used by the five county planning committee in the preparation of conservation plans and proposals for management of anadromous fisheries.

METHODS

STUDY AREA

The Conservation Plan and more specifically, the study outlined below applies to the five counties of Humboldt, Del Norte, Mendocino, Trinity and Siskiyou except for areas upstream of dams that prevent fish migration and portions of Siskiyou and Mendocino Counties in the Sacramento and Russian River basins, respectively. This study did not include lands within the counties under federal jurisdiction (e.g., National Forests) or activities primarily regulated by the state (e.g., under the Forest Practices Act). The study area is further defined as private lands within county regulatory jurisdiction exclusive of lands where the primary uses are timber production or agriculture. County policies which regulate mining and energy development were not reviewed.

STUDY GOALS

1. To determine the effectiveness of existing policies, regulations, California Environmental Quality Act (CEQA) process, mitigation measures and land use practices in minimizing effects of county-regulated or funded activities on anadromous salmonids and their habitats. These activities include the range of discretionary development approvals as well as routine county activities such as road maintenance and flood control. The scope of review spanned planning and approval processes through implementation.

The assessment included evaluation of the effectiveness of practices and policies in six categories of potential impacts:

- Streamflow quantity modifications
- Riparian clearing
- Sedimentation
- Instream habitat modification (physical)
- Water quality impairment (thermal, biological or chemical)
- Migration barriers

2. To determine what, if any, additional procedures may be necessary to protect fish and habitats and where.

Task 1: Identify Activities with Potential Impacts

It was acknowledged that some, perhaps not many, county activities may affect anadromous salmonids and their habitats. The first step in this study was to identify the range of activities and specify their potential impacts. Appendix A lists the ones which have the greatest potential for affecting anadromous fish and their habitats. We excluded activities regulated by state or federal agencies: e.g., municipal water development, major flood control projects, forest practices, point source industries, state highways. We also excluded activities that are either federally-funded or for which a federal permit would be necessary: e.g., instream mining, public utilities' use permits. These projects normally require a formal consultation with National Marine Fisheries Service under Section 7 of the Endangered Species Act. Finally, we did not consider activities within city limits or urban spheres of influence because the city in question would be the lead agency.

We focused on land use activities regulated by counties and possibly subject to state permits: residential, commercial, industrial uses, county and other local agency public works and recreation projects; and recurring maintenance and operations or emergency response in which the county is the primary decisionmaker: 1) county transportation system maintenance; 2) drainage and flood control system maintenance; 3) disaster preparedness and emergency response to natural or human-caused disasters. For purposes of analysis, activities occurring near streams supporting or potentially supporting anadromous fishes received the greatest scrutiny.

In Task 3, described below, we worked with county staff to determine which of the activities listed in Appendix A were most important in their county.

Task 2: Inventory Mitigation Procedures
According to CEQA and common understanding, mitigation measures include actions taken to avoid significant impacts or reduce them to a level that is not significant. Mitigation may include replacement or compensation for lost resources.

This task entailed identification of the formal and informal ways in which each county intervenes to prevent or reduce potential effects on anadromous salmonids. We considered two formal categories of intervention: policy (e.g., general plans, subdivision, zoning and other ordinances, etc.) and environmental review procedures and associated mitigation measures (e.g., CEQA documents, permit conditions). We also reviewed informal practices, such as erosion control methods used at construction sites, in the field.

Task 3: Assessment of Mitigation Procedures
The goal of the assessment task was to determine the effectiveness of county mitigation procedures in protecting anadromous fish and their habitats. Two levels of mitigation were considered: adequacy of general development and environmental review procedures for projects and adequacy of specific protective measures. Assessment at the first level required selecting a group of discretionary projects and tracking their review process (i.e., a case study approach). Assessment at the second level involved investigating the specific activities identified by planners and others in the five counties as important (i.e., a field evaluation).

Criteria for case study selection were:

- Case studies should be typical development activities.
- If possible, selected projects should be located near streams with anadromous fish populations or potentially capable of supporting anadromous fish.
- Projects should have been reviewed under the current regulatory system.
- Complete documentation of the approval and environmental review process must be available.
- In the event that field review is undertaken for case studies, the landowners must be cooperative and the sites must be accessible.

Examples include residential or commercial development, county road construction or county flood control projects.

The case study evaluation process began by meeting with the local assessment team to select projects for evaluation. Files were obtained and documentation was reviewed. Involved personnel were interviewed. Findings and conclusions were documented on standardized forms.

In the field review phase, the local assessment team met to discuss important land use and development activities occurring in the county. A selection of field sites was then chosen and visited by the team. In some cases, projects were reviewed which were outside the study area (near non-ESU streams) because these were the most recent examples of that type of the project in the county. Observations of team members were recorded on standardized field forms.

Task 4: Recommend Additional Protective Tools
The products of the first three tasks are: 1) list of activities and potential effects; 2) inventory of tools in place; and 3) evaluation of activities and tools used for protecting anadromous fish and their habitats. These products are the basis for proposing modifications of procedures or additional procedures to bolster existing mitigation tools.

RESULTS

IMPORTANT ACTIVITIES IN EACH COUNTY

The five county area is largely rural with a relatively small population compared to the majority of California. The population of the area as a whole grew from around 206,000 in 1970 to about 290,000 in 1995. With a total land area of 11.9 million acres in the five county area, the current population density is around 16 persons per square mile. However, much of this land is either in public ownership or used for industrial timber production. Therefore, urban and rural development tends to concentrate around the coast or near existing developed areas. The five county study area exhibits a gradient of urban development pressures that is least in inland counties and greatest on the Mendocino coast and Humboldt Bay.

The dramatic effects of recent weather and runoff events profoundly affected the five counties. In 1997, storm severity and damage was greatest in Siskiyou and Trinity Counties and lessened on the coast. In general, over the past several years, emergency response to public infrastructure has consumed a great deal of each county's maintenance activity.

Prior to conducting field assessments, the assessment team for each county met to review the list of activities in Appendix B and identify the places and activities of greatest significance in each county. It was recognized that from county to county the kinds of activities and types of development occurring would differ. Table 1 summarizes the results.

The Del Norte team met on June 4, 1998. They reported that the most important construction activities are clearing and grading associated with land development. An average of 260 building permits/year for new construction were issued over the past three years. Population growth has averaged 3 percent over the past decade. There has been an average of about 40 minor and major subdivisions/year over the past three years. Retention basins are commonly used to control non-point source pollution and stormwater runoff. Maintenance activities are mainly associated with emergency response to storm damage. Storm runoff and poaching are use-related activities.

The Humboldt County team met on June 17. They reported that urban development activities are important currently, especially around Humboldt Bay, and the county also has a bridge replacement program. Emergency responses have been the most important maintenance activities. Habitat loss and domestic water use have been issues in drier portions of the county. Non-point source pollution is also considered a significant activity by planning staff.

The Siskiyou County team met on May 15. They reported only limited new development occurring in northern or western Siskiyou County. There have been about 120 housing units/year and three subdivisions/year (most under 50 lots) approved over the past decade. Most growth is happening in the southern part of the county, outside of the Transboundary ESU. Almost all

county maintenance has lately been concentrated on response to storm and flood damage. Domestic water use is considered to be important to fisheries in some basins.

Table 1: Significant Activities as Identified by County Staff

	Del Norte	Humboldt	Mendocino	Siskiyou	Trinity
CONSTRUCTION					
Site clearing	X	X	X		X
Grading	X	X	X	X	X
Culvert installation		X		X	
Bridges		X	X	X	
Roads				X	X
Levees					
Artificial channels					
Channel structure installation					
Retention basins/overflow channels	X	X			
MAINTENANCE					
Emergency grading	X	X	X	X	X
Street sweeping					
Road watering					
Culvert clearance/repair	X	X	X	X	X
Bridge repair		X		X	
Road sanding				X	
Snow plowing					
Road regarding/resurfacing	X	X	X	X	X
Channel clearing			X		
Levee repair					X
Floodplain clearing					X
Erosion control	X			X	
Landslide removal	X	X	X	X	
Herbicide spraying					
Roadside brushing					
USE-RELATED					
Habitat loss/reduction		X			
Domestic water use/stream drawdown		X		X	X
Storm drainage	X	X	X		
Waste water discharge			X		X
Direct taking	X				
Domestic animals		X			

The Trinity County team met on April 13. Clearing, grading and road construction associated with residential development are significant activities as reported by staff. Population growth has been low or negative over the past decade. Routine and emergency road and culvert maintenance are important. A 1988 survey identified 61 migration barriers on county and state roads in the Trinity River basin. The county has inherited responsibilities for repairing and maintaining about 6 miles of flood control levees. In several basins streamflow is the principal source of domestic water for existing and new residential development. Termination of maintenance on county roads has been a recent response to declining maintenance budgets.

The Mendocino County team met on May 8. Staff reported that urban development both in upland and floodplain sites is active. Roughly 350 housing units/year have been built over the past seven years. Population growth has averaged 1.3 percent/year over the past decade. Most maintenance is associated with storm damage or routine debris clearing at culverts. Non-point source pollution from both storm drains and septic systems is important in some basins.

PLANNING REVIEW

Introduction

Table 2 lists the documents reviewed during this study. The activities and the actual amount of geographic area under county jurisdiction is a relatively small component of the five county area. However, activities regulated by counties, particularly land use and development can have significant impacts on salmonid habitat.

Table 2: General Plan Policies and Ordinances Reviewed

County	General Plan Elements and Ordinances
Del Norte	Seismic safety and safety; Standards for private rural roads; Conservation and open space; Grading; Recreation; On site disposal systems; Land subdivision Subdivisions; Land use; Natural hazard area district; Local Coastal plan; Flood damage prevention; Marine and water resources; Coastal zoning; Specific area policies; Hazard areas; Visual resources; Public works; Land use zones; Coastal plan – special study area
Humboldt	Land use and development; Subdivision; Hazards and resources; Zoning; Public services and facilities; Coastal zoning; Interim implementation standards for the open space element
Mendocino	Land Use; Zoning; Housing; Coastal zoning; Circulation; Safety element; Seismic safety; Open space and conservation; Salmon and Steelhead management plan; Coastal Element
Siskiyou	Conservation; Subdivision; Land use and circulation; Zoning; Seismic safety and safety; Flood damage prevention; Housing; Land Development Manual - Subdivision grading; Scott Valley area plan
Trinity	Land use; Zoning; Open space and conservation; Grading – decomposed granite soils; Transportation; Subdivision; Recreation; Floodplain management; Seismic safety; Housing ; Hayfork community plan

In California, land use planning authority is delegated to local governments, including 58 counties and 456 incorporated cities. State law requires that local governments adopt general plans for their physical development. These long-term plans comprise official county policy regarding the location of housing,

business, industry, roads, parks and other land uses; protection of the public from environmental hazards; and the conservation of natural resources, including fisheries. State law requires that general plans contain seven components or "elements": land use, circulation, housing, conservation, open-space, noise, and safety.

Most of the land use and conservation policies developed by local governments are responses to state mandates. Good examples of this response are the “Local Coastal Plans” mandated by the California Coastal Act for all cities and counties that lie within the designated “Coastal Zone”. The goal of these plans is to maintain and enhance the quality and productivity of coastal waters and sensitive coastal habitats (including estuaries, wetlands, and riparian vegetation). Land use in and adjacent to biologically sensitive habitats may not alter or impact the biological productivity of these areas or the viability of species using these areas.

Habitat conservation planning is a broad responsibility of county government. Activities which may harm the habitat of an endangered species, in this case salmonids, must be reviewed by county staff to determine whether they may affect habitat. If so, then county staff must develop feasible measures to avoid these impacts through the CEQA process, and through implementation of county plans and ordinances.

General plan policies and ordinances are the beginning point for the development review process. Goals and policies in general plan elements may not be realized on the ground if there are no measures included in county ordinances to implement them. As staff analyze proposed projects through the CEQA process, they may add mitigations to avoid impacts to fish habitat which are not listed in the county elements or ordinances. Some of these additional mitigations are discussed in the case study and field assessment results sections. However, since these extra mitigations are not consistently applied or documented, they are not included in this analysis.

In this study, all general plan elements of the five counties were reviewed to identify policies for the protection of anadromous fish and their habitats. For the three counties within the Coastal Zone (Mendocino, Humboldt and Del Norte) local coastal plans were reviewed. We also reviewed several specific and community plans. We conducted a review of most ordinances (e.g., zoning, subdivision) and implementation procedures for all five counties as well to determine if specific consideration is given to protection of anadromous salmonids.

Our policy review focused on activities for which the county is the lead agency under CEQA, primarily land development and construction. Other activities which were reviewed in the field, including building and maintenance of county roads, bridges, and flood control structures, and emergency response to flooding and road closure typically take place without written policies.

The results of the review are presented in a series of tables in Appendix D. These tables provide great detail on existing policies, internal planning consistency and the relationships between policies and categories of impacts on anadromous salmonids. In the following sections, the highlights of our review are presented.

Policy Analysis

Since salmonid habitat conservation has not been a particular focus of state mandates, few policies directly protecting salmonid habitats were found in county level policies outside of the Coastal Zone. All of the counties’ general plans contain goals for maintaining wildlife and fish species within their jurisdictions. Mendocino County is unique in its level of articulation for fish habitat conservation goals. The county developed a Salmon and Steelhead Management Plan in 1984, a portion of which has been adopted as official county policy and incorporated within the land use element. These policies direct the county to inventory fish streams, protect and restore fish habitat, allow only compatible development along important stream sections, and protect riparian vegetation. The county is directed to modify grading and other ordinances to implement these goals and require reasonable and appropriate mitigation measures whenever county approval is required for projects which may degrade or destroy stream habitat. Despite these strongly worded policy goals, most of the recommended changes in ordinances have not been adopted, leading to inconsistent implementation of these goals.

Although specific policies for conservation of fish habitat are absent from most county documents, county policies do routinely address impacts to some components of fish habitat. Policies which regulate riparian vegetation and floodplains, streamflow quantity, sedimentation, instream habitat, water quality, and migration barriers were reviewed for content and consistency. The results are discussed by category of impact addressed.

Riparian Vegetation: Riparian vegetation is a critical component of high quality fish habitat. It provides channel bank stability and buffers the stream from inputs of heat, sediment, and water from adjacent lands. Disturbance which removes riparian vegetation can leave the stream channel vulnerable to erosion, and allow unacceptable levels of inputs to reach the stream. The status of riparian vegetation is largely determined by how streamside areas and the stream's adjoining floodplain are managed. The counties use a variety of approaches for riparian vegetation protection (Table 3).

Table 3: Riparian Vegetation Protection Policies

County	Del Norte	Humboldt	Mendocino	Siskiyou	Trinity
Streamside Management Area	Resource Conservation Zones (RCAs) in coastal area only	Streamside management areas (SMAs) throughout county	Environmentally Sensitive Habitat Areas (ESHAs) in Coastal Zone only	None	None
Floodplain Mangement Ordinance	Yes, but allows building in floodplains	Yes, but allows building in floodplains	Yes, but allows building in floodplains	Yes, but allows building in floodplains	Yes, but allows building in floodplains Flood zone hazard may be adopted in specific area plans which prohibits any permanent facilities
Flexible Development Standards	Yes	Yes	Yes	Yes	Yes
Other Tools	Natural Hazard Ordinance				Scenic conservation overlay zone

Streamside Management Areas: The best method to protect riparian vegetation is to identify streamside areas, give the areas special status and then restrict activities that may take place there. Humboldt County is unique in its designation of streamside management areas (SMAs) throughout the entire county. Del Norte and Mendocino designate SMAs in their Coastal Zone only, while Trinity and Siskiyou have no official SMA designations.

The activities allowed within SMAs depend on the county and the protective mechanism used. Coastal SMAs are required by the state Coastal Act. There is no similar state directive for inland areas.

Coastal SMAs, which are outlined in the counties' coastal elements and coastal zoning ordinances, restrict most new development within a defined riparian corridor. Exceptions are provided for road maintenance

and repair, placement of wells, utilities, and maintenance of existing flood control structures and practices. Some removal of riparian vegetation for personal use or safety is permitted so long as a specified amount of vegetation is maintained. Timber harvesting is allowable under state regulation.

New development, including single family dwellings on existing lots, may occur within coastal SMAs with a discretionary permit when there is no feasible alternative site within the parcel. The functional capacity of the habitat should be maintained and replanting riparian vegetation may be required. SMA rules do not allow creation of new parcels within riparian zones.

Humboldt limits development within 50 to 200 foot wide buffers along all perennial and intermittent streams in the Coastal Zone. Mendocino's coastal element establishes buffer areas adjacent to all environmentally sensitive habitat areas (ESHAs), including streams, which are typically 100 feet, but not less than 50 feet wide on each side of the stream.

Del Norte County's SMAs are designated as legal zones, called Resource Conservation Areas (RCAs). RCA1 zones designated along Coastal Zone streams preclude development until the resource area is mapped. Once the actual extent of the resource area is known, it is rezoned to RCA2 status and specific development guidelines are developed. Generally, no new development is permitted within the RCA2 zone.

Outside the Coastal Zone, Humboldt County provides interim standards in its open space element to determine whether applications for grading or building permits will result in any grading or construction within 100 feet of a perennial stream or 50 feet of an intermittent stream (outside urban areas). If so, the county refers the project for review by the Department of Fish and Game. No grading or building permit may be issued if the SMA is significantly impacted. Any project must comply fully with mitigation measures.

No official SMA designation exists in the non-coastal areas of Mendocino or Del Norte Counties. Mendocino's general plan does direct the county to identify and protect riparian vegetation by adopting appropriate standards within the zoning ordinances and by adopting a grading ordinance, however, neither has occurred. Generally, the county requires a minimum setback of 20 feet from streams where no encroachment is permitted.

Del Norte County's conservation and open space element recommends protected riparian corridors along local streams, creeks and sloughs to maintain wildlife habitat. Neither the land use element nor zoning ordinance contain provisions to implement these recommendations outside the Coastal Zone at the present time.

In the absence of officially designated SMAs, county governments use other tools to keep development out of streamside areas with varying degrees of success. These include natural hazard ordinances, scenic overlay zones, and floodplain management ordinances. Open space zoning can provide permanent protection from most forms of development in riparian areas. This tool is not used in the five counties.

Del Norte County uses a natural hazards ordinance to restrict development along some streams and rivers. Lands in this zone must have analysis and mapping done which shows that development would be low risk before permits can be issued. This supplements the county's flood hazard ordinance by restricting uses along some stream channels to vegetation maintenance and emergency work. This zone will allow riprap or alteration of embankments, landforms and watercourses and construction of structures within the natural hazard zone with a use permit when upstream and downstream lands have been protected from direct and indirect impacts resulting from the alteration.

Trinity County has a scenic conservation overlay zone which requires county review and issuance of a use permit for development within the 100 year floodplain and within 50 feet of scenic streams. All uses within the underlying zone are permitted provided a planning director issues a use permit. Review may consider removal of vegetation as well as the location of buildings, development of private and public roads or driveways, decks, boat landings, and wells.

Zoning and subdivision standards may be waived or variances may be granted to preserve the integrity of the riparian corridor. All five counties allow for the design of development to protect public resources by consideration of site topography and other natural features, slope stability, natural resource management, critical wildlife habitats, and protection of water quality. This flexibility may be achieved through planned unit development or cluster development zoning. Specific changes may include reduced minimum lot size, density transfers, and waiver of side yard requirements to accommodate the natural topography of the riparian corridor. Trinity's zoning ordinance directs the county to prevent divisions of land which would actually or potentially be harmful to critical habitat, especially for endangered species.

Floodplain Management: The riparian area, is by definition, a portion of the stream's floodplain. Management of the floodplain to preserve riparian and stream functioning is critical to fish habitat quality. Keeping structures out of the floodplain reduces the chances of subsequent stream alteration. Experience has shown that once homes and businesses are constructed on the floodplain, there is increasing pressure to manage the stream channel to reduce flood and erosion risks. Often this will involve installation of levees, clearing of riparian vegetation, or hardening of channel banks, all with negative consequences for fish habitat. In addition, reduction of the stream's floodplain capacity increases the velocity of floodflows, allowing increased erosion to occur.

Although most of the counties' general plans articulate the goal of preserving the integrity of the floodplain, this is not carried through into floodplain management policies which are instead oriented towards avoiding damage to property. Residential, commercial and industrial development are still allowed in floodplains. Floodplain management is therefore, in effect, confined to reducing damage to structures.

Floodplain management is treated similarly throughout the five county region, largely due to overriding federal policy on flood hazards. The floodplain area is divided into two major sections, the floodway or primary floodplain and the floodzone, or secondary floodplain. The floodway is defined as the stream channel and immediately adjacent lands (i.e., bankfull). The floodzone is the area prone to flooding during the 100 year flood as defined by the Flood Insurance Rate Map (FIRM) delineated by the Federal Emergency Management Agency (FEMA).

Uses allowed in the floodway or primary floodplain are agriculture, forestry, and public utilities. In Humboldt, Mendocino and Siskiyou, other development is restricted with prohibitions on encroachments, including fill, new construction, or substantial improvements unless certified by a registered professional engineer or architect that encroachments will not result in any increase in flood levels during the occurrence of the 100 year flood. If no floodway is identified (i.e., no FEMA maps exist), then a setback of twenty feet from the bank(s) of the watercourse is established. Alteration of watercourses is allowed for limited reasons (water supply, flood control, gravel extraction) as long as the flood carrying capacity is maintained and the appropriate agencies are notified.

The secondary floodplain or floodzone area is within 100 year flood boundaries but outside the floodway. A development permit must be obtained before construction or development begins within the floodzone. The applicant must include a description of the extent to which any watercourse will be altered or relocated as a result of development. All counties require flood proofing of water and sewer facilities and restrict storage of hazardous wastes in floodplains to prevent contamination during floods. Developers must also demonstrate that their structures will not hamper floodflow and that the ability of flood water to flow through the area is not restricted.

Uses permitted in the floodzone or secondary floodplain include agriculture, forestry, and public utilities. Other uses are also permitted with a use permit, including recreation, feed lots, mining, flood control structures, and energy generation. In addition, residential, commercial, and industrial structures are allowed if they are elevated above the 100 year flood level. What this policy may result in is the filling in of the floodplain with soil so that structures built are elevated at least a foot above the flood level. Although strict adherence to this floodplain management ordinance may successfully preserve property, it does little to preserve a functioning floodplain and natural fish habitat.

Trinity County is unique in its designation of a flood hazard zone as an exclusionary zone. This zone, which may be established only through a community or specific plan, prohibits any permanent facilities, allowing only agricultural or recreational uses as well as mining with a use permit. Trinity County also has

flood hazard overlay zoning which corresponds to the flood hazard zoning described for other counties except that it does not distinguish between the floodway and floodplain. It is also unique in that its floodplain management ordinance directs the planning director to consider impacts on fish and wildlife when issuing use permits in floodplains.

A local area plan in Siskiyou County is of interest for its floodplain restrictions. The Scott Valley area plan requires all parcels in secondary floodplains to be a minimum size of 10 acres.

Streamflow Quantity Modification: Streamflow quantity can be modified through withdrawals of water for domestic use and through increases in accumulated run off from surfaces hardened by development. Counties use a variety of tools to avoid these impacts (Table 4).

Table 4: Stream Flow Quantity Modification Avoidance Policies

County	Require Proof of Water for Development	Regulate Effects on In-stream flow	Critical Water Zones	Storm Water Retention Requirements
Del Norte	Yes	Conservation and open space element states goal	None	None
Humboldt	Yes	Coastal zoning ordinance requires minimum flows to be maintained	Yes	Applied to areas where drinking water is susceptible to contamination Coastal subdivisions require site development to minimize direct surface runoff Major subdivisions may not increase flood discharge General plan lists standards for SMAs
Mendocino	Yes	Coastal element requires diversions to not have a significant effect	None	Coastal zoning requires review of development permits for runoff impacts and imposes standards
Siskiyou	Yes	None	None	None
Trinity	Yes	None	None	None

Instream Flow Withdrawals: All of the counties acknowledge water supply as an issue in development and mandate water conservation and planning for the long term water needs of county residents. They also impose requirements on developers to prove the availability of water before subdivision and construction is allowed.

The degree to which water supply concerns apply to streamflow for fish habitat varies. Four of the five counties have goals in their general plans to balance development with maintenance of adequate streamflow for fish habitat. However, of these, only Humboldt implements these goals in its zoning or subdivision ordinances.

Humboldt's coastal zoning ordinance permits development along anadromous fish streams only if it will not have a significant impact on instream flow regimes and coastal resources. Discretionary permits are issued only if minimum stream flows necessary to protect anadromous fish populations are maintained throughout the year. For the rest of the county, the general plan articulates the need to assess the

cumulative impacts of water withdrawal from surface and groundwater sources and sewage disposal during rural development, although it does not identify water needs for fish streams as a particular concern.

Mendocino County's land use element states a goal of supporting instream flows adequate to maintain and protect the historic fishery values within all county streams. The coastal element requires that structures or projects involving diversion of water from streams be sited and designed to not reduce stream flows to a level which will have a significant effect on the productivity of the stream and its organisms. The coastal zoning ordinance does require that rural subdivisions take place only if there are no significant adverse effects on environmentally sensitive habitats.

Del Norte's conservation and open space element contains the goal of insuring flows of adequate quantity and quality to protect fisheries but does not address the issue in zoning or other ordinances. Siskiyou's general plan and ordinances make no mention of fisheries' streamflow needs.

Although Trinity County's general plan does not address instream flow needs for fisheries, it does have a critical water resource zoning designation. This zone may be applied to any land within the county for which it is determined that development involving extractions of ground and/or surface water may be beyond the capability of the water resources. Water availability must be proven by an on-site well located a minimum of 100 feet from any stream, a spring, or public water system before any subdivision may take place. The Hayfork Community plan directs county staff to design subdivisions so that no additional parcels are created with riparian water-rights.

Humboldt's critical water zone does not address streamflow quantity so much as it does protection of drinking water source watersheds. The zone may be applied to specific areas used by communities as a water supply system, which are susceptible to a potential risk of contamination from development activities. Developers must demonstrate that no risk of contamination to the water supply would occur. Appropriate erosion control measures are required.

No specific policies on streamflow management were found for Siskiyou county.

Stormwater Retention: Another impact on streamflow and fish habitat arises from changes in the hydrologic properties of developed land. Development projects typically involve creation of hardened surfaces, impervious to precipitation. During storms, rain that flows from parking lots or roofs will enter streams more quickly than it would under natural conditions. In highly developed urban areas with mostly impervious surfaces, the change in the magnitude and timing of flow can have a significant effect on fish habitat.

Storm water retention measures are required by only two of the five counties' policies. Although each county specifies the percentage of impervious surface allowed on any particular parcel within a land use zone, measures to slow increased runoff are lacking in most county plans and ordinances. Instead, policies focus on facilitation of rapid drainage from lands in order to reduce the risk of on-site flooding. Counties specify the size of culverts and drainage channels necessary to efficiently convey storm water. Counties also require and review drainage plans on new developments to ensure that increases in runoff do not affect abutting properties. County policies do state a preference for use of natural drainage ways or channels rather than constructed ones.

Humboldt County and Mendocino's coastal plan have storm water retention requirements. Humboldt's subdivision regulations require site development to be accomplished wherever possible to maximize percolation and infiltration and minimize direct surface runoff into adjoining streets, water courses, or properties. Subdivisions which create four or more parcels in a floodplain may not lead to a net increase in the flood discharge due to development.

Humboldt County's general plan also lists specific measures to manage storm water during construction in or near SMAs and on public and private roads in the Coastal Zone. Runoff must be controlled by on-site methods including infiltration basins, percolation pits, or trenches, or off-site methods including detention or dispersal over non-erodible vegetated surfaces. Silt, organic, and earthen material from sediment basins must be disposed of outside of the SMA. Controls during Coastal Zone road construction include dissipated discharges and stream bank protection at the point of discharge into channels.

Mendocino's coastal zoning ordinance requires review of all coastal development permit applications to determine impacts due to runoff. The county may then impose storm water control methods including retention of water on level surfaces, the use of grass areas, underground storage, and oversized storm drains with restricted outlets or energy dissipaters. Use of natural topography and vegetation for retention facilities and drainage structures is preferred where possible, although planted trees and permanent ground cover may be required. Performance bonds may be required to ensure adequate maintenance of common retention basins or ponds. Mendocino also requires that runoff from developments within wetlands not exceed the natural rate and specifies use of a combination of storm water storage and controlled release.

Del Norte, Siskiyou, and Trinity policies make no special mention of storm water retention measures, although a storm water retention basin, which was required as a project mitigation, was observed by the assessment team in Del Norte county. The Hayfork Community Plan in Trinity County suggests use of settling basins to contain contaminants from commercial and industrial parking areas.

Channel Modification And Maintenance: Modification of stream channels causes changes in habitat which can have negative impacts on fish. The primary agencies regulating activities in stream channels are the California Department of Fish and Game through the requirement for streambed alteration agreements (non-discretionary) and the federal government through the US Army Corps of Engineer's Section 404 permitting process.

The counties regulate modification of channels primarily through their land use designations which specify the types of activities which may occur in the channel (see also streamside management areas and floodplain management). Subdivision and flood management ordinances also describe the process necessary for permitting alteration of natural channels. In general, development within stream channels is restricted to fishery enhancement projects, road crossings, flood control and drainage channels, mineral extraction, hydroelectric power facilities, fencing, agricultural diversions, wells, bank protection, and necessary utilities.

Coastal elements and zoning ordinances require that channelization, dams and other substantial alterations of rivers and streams be limited to projects necessary for water supply and flood control where no other method is feasible, and that all permit applications for these uses demonstrate that sensitive habitat areas are protected against disruption and incorporate the best mitigation possible. Del Norte's coastal zoning ordinance requires that flood control projects be undertaken only if there is no other feasible method for protecting existing development in the floodplain. In addition, permits for road construction are allowed only if alteration of natural streams and drainage is minimized and there are no feasible alternatives.

Humboldt County specifies policies on bank protection on the Mad and Eel rivers. Continuous revetment is identified as the least preferred method and must be mitigated by revegetation and projects to minimize effects on fisheries.

The counties' flood damage prevention ordinances also typically require that adjacent communities and the state be notified prior to alteration or relocation of a watercourse, and that flood carrying capacity be maintained. Mendocino's safety element directs the county to achieve flood damage prevention through non-structural means.

There are very few formal policies on channel maintenance in the five county area's general plans and ordinances. Mendocino's coastal element emphasizes the importance of clearing trash and accumulated debris from coastal streams and encourages these activities wherever possible. Del Norte's plan for management of the Elk Creek/Marhoffer Creek wetland limits vegetation and debris removal to times when impediments create flooding hazards on adjacent lands. Generally, channel maintenance procedures are based on experience of maintenance workers. Channel maintenance may however, be subject to state or federal regulation.

Sedimentation: Land development and construction activities which are ground disturbing have the potential to release sediment into anadromous fish streams unless adequately controlled. All of the counties' general plans identify soil erosion and subsequent sedimentation of lakes and streams as issues to be addressed. Policies to avoid sedimentation are mostly contained within counties' land use, conservation

and safety elements which address grading, hillside development, road standards, and treatment of geologic hazard areas (Table 5).

Table 5: Sedimentation Control Policies

County	Uniform Building Code	Grading Ordinance	Other Grading Controls	Hillside Development on Slopes > 30%
Del Norte	Yes	Coastal zone grading ordinance prohibits grading that might harm RCAs	None found	Subdivision ordinance bans development, except for accessways
Humboldt	Yes	None	Interim guidelines for open space element require grading not affect SMAs.	None General plan discourages development on steep slopes
Mendocino	Yes	Land use element requires grading ordinance, but none adopted	Coastal zoning ordinance requires grading avoid damage to EHSAs	Not allowed without engineer's assurance in coastal zone, Should avoid these areas in rest of county
Siskiyou	Yes	None	Land development manual says measures may be required by the county	May be allowed where special construction methods are used
Trinity	Yes	None	Subdivision ordinance imposes special erosion prevention standards in decomposed granite soils	May be allowed where special construction methods are used

Grading: County governments have the legal authority to control the size, timing, and location of grading and vegetation clearing done in conjunction with construction. The strength of these controls varies, and as usual, they are more restrictive in the Coastal Zone. In each of the counties, grading controls are limited to the provisions of the Uniform Building Code (Appendix 33). A grading plan must be submitted as part of the building permit and work may be stopped if violations of the permit occur. Grading permits are typically not required for agriculture, emergency work, non-construction, or small projects which involve less than 500 cubic yards of material.

Coastal Zone policies require additional review and mitigations near SMAs. Del Norte's grading ordinance prohibits grading which may harm Resource Conservation Areas (RCAs) in the Coastal Zone unless the hazard can be eliminated by retaining structures, fills, drainage or vegetation buffers.

Mendocino's coastal zoning ordinance requires that grading in and near SMAs avoid mechanical damage and changes in subsurface water and roots of riparian vegetation. Grading throughout the Coastal Zone must be kept to a minimum, fit natural contours, not interrupt natural drainage patterns, and be limited in duration. The county requires a plan for installation of erosion control devices and a performance bond to assure installation and maintenance. Devices must include sediment basins and provisions to infiltrate or conduct surface runoff away from cut and fill slopes. Cut areas must be permanently stabilized and protected from erosion by vegetation or other means so that the erosion rate does not exceed that existing before development. Existing vegetation must be protected during construction and replanted as soon as possible, using native vegetation in SMAs.

Mendocino's land use element directs the county to adopt a county-wide grading ordinance however, one has not yet been adopted. All proposed county projects must assess erosion potential and contain preventative measures to minimize erosion. The county is further directed to undertake a survey of its roads and other facilities and establish a program to eliminate problems.

Humboldt County policies articulate the goal of protecting sensitive habitat areas (i.e., SMAs) from impacts caused by building and grading. The interim guidelines for the open space element require that county staff determine whether building or grading would take place within SMAs. If so, then the application must be referred to the Department of Fish and Game for review, and the permit can only be issued if the project will not impact an SMA, and mitigations are fully implemented. In the Coastal Zone, all major vegetation removal requires a special permit (except for timber harvest through CDF and removal through a building permit, use permit or subdivision) and may only be issued if it will have no adverse impact on habitat and includes mitigation.

Siskiyou and Trinity counties, which have no Coastal Zone, have no additional grading ordinance beyond the UBC (Except in decomposed granite for Trinity County. See discussion, below). Their general plans direct the counties to adopt regulations requiring the landscaping and maintenance of vegetation on all cut and fill slopes. Trinity's land use and housing elements allow the county to require the builder to take special measures to prevent erosion as a result of disturbance from development. These standards, which apply to areas with soils of decomposed granite, are spelled out in Trinity's subdivision ordinance which requires cut and fill slopes to be seeded and fertilized to prevent soil loss from slopes after construction, rocking of drainage ditches, and specifies a minimum culvert size of 18 inches with dissipating surfaces at the outlet.

Siskiyou's land development manual lists subdivision grading requirements including planting of vegetation on excavation and embankment sites. Erosion and pollution control devices may be required by the county to convey storm waters without erosion.

Hillside Development: Development on steep slopes carries increased potential for soil erosion and subsequent stream sedimentation. The degree to which development on steep slopes is restricted varies across and within the counties. General plan policies in Trinity, Siskiyou, Del Norte, and Mendocino counties all discourage development on slopes over 30 percent. However, Trinity and Siskiyou may allow these developments where special methods of construction are used. In Trinity access to flat areas may be through slopes greater than 30 percent.

In Mendocino's Coastal Zone, development is not allowed on slopes over 30 percent without evidence from an engineer that it will not increase erosion. The general plan also states that road and building site construction should avoid areas over 30 percent slope in the rest of the county. The open space and conservation elements suggest adopting an ordinance to control the density and types of development on steeply sloping lands.

Del Norte's subdivision ordinance bans development on land over 30 percent slope as well as on land with 20 to 30 percent slope that has very high soil risks. Driveways and access roads are allowed on 30 percent slope only when limited and where relocation is impractical.

Treatment of Geologic Hazard Areas: Each county is required to identify and map all areas of high landslide risk and impose special restrictions on development and subdivision in these hazardous areas. All development proposals in landslide areas require geologic investigations and may be denied unless certified by a geologist, engineer, or county staff to be reasonably safe or mitigated. Subdivision proposals also must undergo geologic assessment. Some counties impose hazard zoning in potential landslide areas.

In Siskiyou County, mapped landslide areas may be developed for single family residential, industrial and commercial use if proven safe. Minimum lot size on slopes less than 15 percent is one acre, and 5 acres on slopes between 16 percent and 29 percent. Mitigation measures to reduce sedimentation in these locations include contour grading, channelization, revegetation and timing controls. The subdivision ordinance requires determination of whether the proposed parcel would lie within a high risk geologic hazard area and allows denial if the design is likely to cause substantial environmental damage or injure fish or wildlife

or their habitats. Although Siskiyou's safety element calls for geologic hazard zoning requiring a use permit for development, this is missing from the zoning ordinance. In the Scott Valley Area Plan, all parcels in areas with slope 30 percent or greater must be a minimum of 40 acres.

Mendocino's safety element requires consideration of geologic criteria in permitting, land use, and development policy and the zoning ordinance establishes a Special Hazards zone which restricts uses because of potential hazards including steep and unstable slopes. This zone requires that any development which requires a building or grading permit first obtain a minor use permit by submitting a geologic or soil engineering report. In the Coastal Zone, all applications for coastal development permits are reviewed to determine threats from geologic hazards based on a report from a geologist or engineer.

Del Norte County's safety element directs the county to consider prohibiting critical facilities on land subject to landslide potential and recommends that lands with severe geologic hazards be used for low intensity park and recreation activities or be zoned as open space. Natural hazard districts are established which require a use permit for unstable areas. These districts have been applied for the most part on bluffs along streams.

Trinity's open space element directs the county to identify all geologic and soil areas and develop standards for restricted development in hazard areas. The zoning ordinance does not address this requirement, but the subdivision ordinance provides that land in hazardous areas not be divided except with restrictions on how it is used.

Humboldt's policies address concerns of steep slopes and landslide risk within their subdivision ordinance by requiring geologic assessment for all potential subdivisions. Although the general plan calls for revisions of building regulations to address these concerns within non-subdivision permit processes, these revisions have not been done.

Road Standards: All five counties establish minimum standards for construction of private and public roads in subdivisions. For the most part, these standards are focused on ensuring that roads are built to the appropriate width and capacity to accommodate development and services. There are cases in which roads built for private subdivisions are handed over to the county for future maintenance. For these reasons, they typically require that private subdivision roads be built to the same standards as county roads. For example, Del Norte's subdivision ordinance requires new roads to meet county standards or develop a long term maintenance agreement through a homeowner's association. In addition, the public works element directs the county to pursue improvement of existing gravel residential roads in the Coastal Zone to adequate all-weather standards necessary for vital services.

There are several cases where road standards have been developed specifically to address sedimentation impacts. Humboldt's coastal zoning ordinance requires all public and regulated private road construction to employ erosion and sedimentation mitigations including limiting soil exposure time and extent and minimizing the length of slope. Temporary and permanent sediment control measures are required as well as revegetation of disturbed slopes and control of runoff to dissipate discharge and divert it from graded areas.

Trinity County regulates grading for construction and maintenance of public and private roadways in decomposed granite areas of the county. The county may require permits for road construction and improvement and can enforce the standards with fines. Standards for protection of soil, water, and fisheries include maximum road grades of 10 percent, coverage by 6 inches of compacted rock, and outsloping. The guidelines also list the maximum spacing between rolling dips and the acceptable size of culverts based on the size of the watershed. Revegetation of cut and fill slopes and energy dissipaters on culvert outlets are required. Trinity's land use element also directs the county to revegetate highly eroded areas along highways and roads.

Water Quality: Water quality is an important component of fish habitat. All of the counties' general plans identify the need to maintain high water quality standards primarily for residents' drinking water. Many of the regulations which govern water quality are implemented through state and federal agencies. The primary areas of county jurisdiction which affect water quality are septic tank regulations and herbicides. Thermal pollution is not directly addressed in any policies in any counties.

Septic Tank Regulations: All of the counties regulate on-site sewage disposal through a permitting and review process as mandated by state law. Counties establish maximum densities in areas not served by public sewer systems, require soils testing for suitability of the parcel for septic drainage, and establish minimum sewage capabilities. There are also restrictions on installation of septic facilities on steep slopes.

Herbicides: Trinity County's regional transportation plan prohibits the use of herbicides along state highways and county roads. Mendocino's land use element prohibits aerial spraying of phenoxy herbicides and anything containing dioxin, and supports regular monitoring of pesticides and permitted agricultural chemicals. Although herbicide policies are not stated within plans and ordinances for the other counties, staff reported that Humboldt and Del Norte Counties do not use herbicides for county construction or maintenance projects, while Siskiyou County does use herbicides for road side vegetation management.

Migration Barriers: Mendocino County is the only one to articulate official policies on fish migration barriers. Its land use element directs county staff to request adequate mitigation measures to maintain anadromous fish population levels at existing and future stream obstructions and diversions. Its coastal element requires that projects involving water diversion be sited and designed to not impede upstream or downstream movement of fish. The county's salmon and steelhead management plan also articulates the goal of improving the quantity and quality of salmon and steelhead habitat in each watershed by removing barriers to at least 100 miles of habitat each year until all potential habitat is available.

In the field review of county practices, it was observed that Humboldt County uses culvert design guidelines specifically for enabling fish passage.

Summary

All the counties' general plans articulate fish conservation goals to some degree, but specific changes in ordinances or new ordinances to implement these goals have not been developed. Grading controls are an instructive case in point. Although county general plan goals direct the counties to adopt grading ordinances to control unregulated grading, only Humboldt has recently adopted regulations to control grading in and adjacent to stream side areas, and these regulations are not yet formalized.

Floodplain management goals are another instructive example. Plan policies direct counties to preserve the integrity of naturally functioning floodplains; floodplain management ordinances instead allow development in floodplains as long as structures are protected from flood waters. No county currently has the necessary ordinances to consistently achieve the goal of maintaining naturally functioning floodplains (i.e., floodplains which experience periodic, unimpaired overbank flooding).

Fully implementing counties' current conservation goals would provide a foundation for improved fish habitat conservation.

There are currently protective policies in place in some counties and parts of counties and not others. The most protective policies are found in the Coastal Zone. These include fairly effective provisions for riparian buffers, maintenance of streamflow for anadromous fish, management of storm water, prohibitions on development of steep and unstable slopes, and construction mitigations.

The Coastal Zone is a very small percentage of the geographical area in the five counties. Adoption of these policies throughout the five county area would provide a basis for consistent protection of fish habitat.

Issues which are not adequately addressed in most current county policies include grading, development in floodplains, barriers to fish migration, modification of stream channels, and design and location of roads to reduce sedimentation. These are all activities which may have significant effects on fish habitat. The five counties should explore new protective policies to avoid the impacts of these activities.

In addition, most county sponsored activities such as construction and maintenance of county roads, bridges, and stream crossings do not have formally written policies which may be examined for their accommodation of fish habitat. Although many good examples of fish friendly practices were observed during the field assessment, these practices occur because of the outstanding efforts of particular

individuals with authority in county agencies, not because they are official county policy. Codification of fish friendly practices into official policy would expand the ability for their consistent application.

Specific Conclusions and Recommendations

Policy - General Plans:

- Conclusion 1: With the exception of Mendocino County, none of the county general plans have policies specifically protective of anadromous salmonids and their habitats. Local Coastal Plans provide guidance for protection in Mendocino, Humboldt and Del Norte Counties.

Recommendation 1A: Mendocino County's land use element policies relative to anadromous salmonids, drawn primarily from its Salmon and Steelhead Management Plan (now out of date), could be used as a starting point for a round of general plan revisions in all the counties. Some counties (Del Norte and Mendocino) are already in the process of general plan revision. Also, see Recommendation 2A, below.

Recommendation 1B: As an alternative, the five county conservation planning effort could promote regional policy consistency which currently does not exist. Possible vehicles for this include the interim conservation plan itself, habitat conservation plans, or a watershed element of each general plan.

Policy – Ordinances:

- Conclusion 2A: There are few development standards or procedures specifically related to anadromous salmonids in zoning or subdivision ordinances in the five counties, although some standards (e.g., erosion control) indirectly provide protection.

- Conclusion 2B: Several general plans list implementation measures directly or indirectly beneficial to anadromous salmon habitat, including revisions of subdivision and floodplain management ordinances and adoption of grading ordinances, which have not been carried out.

- Conclusion 2C: Coastal Zone regulations that protect streams and riparian zones benefit anadromous salmonids.

- Conclusion 2D: Floodplain management ordinances focus on protection of people and development from flood hazards and provide limited protection to anadromous fish and their habitats.

Recommendation 2A: Coastal Zone riparian protection regulations should be considered as models for protection of streamside riparian zones throughout the five county region.

Recommendation 2B: Additional development standards may be needed to fully address the potential range of impacts on anadromous salmonids

Recommendation 2C: Flood management regulations should be changed to address protection of anadromous salmonids and their habitats. This may involve prohibition of development in secondary floodplains as well as floodways on critical streams or stream reaches.

DEVELOPMENT ENVIRONMENTAL REVIEW PROCESS

Eight case studies were evaluated (Table 6). These included five residential, two commercial/industrial and one public service project. The forms used in the case study evaluation process are presented in Appendix B. The following is a narrative summary of the major conclusions. It should be noted that some case studies that were proposed for review were not included because complete documentation was not available.

Table 6: Case Studies Review

Case Study	County	Project Type	Region
1	Del Norte	Commercial development in floodplain	Coastal Zone
2	Siskiyou	Use permit in floodplain	Non-coastal
3	Trinity	Residential subdivision in wetland	Non-coastal
4	Humboldt	Upland Subdivision	Coastal Zone
5	Siskiyou	Use permit in floodplain	Non-coastal
6	Trinity	Residential subdivision floodplain	Non-coastal
7	Mendocino	Subdivision and modification of coastal use permit along stream	Coastal Zone
8	Mendocino	Floodplain subdivision	Non-coastal

.

All of the projects were located in or near the floodplain of an anadromous fish stream. Development in floodplains still occurs in the five counties and although some mitigation measures are proposed, most of these are related to flood protection of structures rather than protection of fish and their habitats

All of the projects were granted mitigated or simple Negative Declarations under CEQA based on Initial Studies and proposed mitigation measures. We saw nothing especially innovative about the environmental review process in any of the counties. Development processing procedures for the counties do not appear to include requirements for environmental analysis during formulation of project plans (i.e., during pre-application). All mitigation measures proposed in Initial Studies and staff reports did not always get adopted as conditions to project approval. That is, they were absent from public documentation such as resolutions. Furthermore, in at least one case, the effectiveness of the proposed mitigation was not certain and the impact was relatively important to fish (maintenance of instream flows). In most of the Initial Studies impacts on fish and their habitats were not specifically mentioned. This in part, is due to the checklists used for Initial Studies; they do not include categories for anadromous fish.

Except in one case, we found no evidence to indicate that mitigation measures proposed in Initial Studies were monitored for implementation or effectiveness.

One major distinction in the case studies was the effect of different regulatory controls inside and outside the Coastal Zone. This is illustrated by the two commercial-industrial projects (Cases 1 and 2; Appendix B). Both were processed 10 years ago but are still relevant today. Both are located in floodplains of streams with anadromous fisheries. Although the Initial Studies and Negative Declarations for both projects made no mention of impacts on fisheries, they did identify non-point source pollution and changes in runoff rates as potential effects. In the Coastal Zone project (Case 1), these effects as well as protection of the stream riparian zone were addressed by creation of a streamside management zoning designation along the stream (wherein development was prohibited) and a grass buffer strip to filter runoff. In Case 2 outside the Coastal Zone, a variety of conditions were applied but no specific buffer was defined. Both projects were conditioned with requirements to meet the county flood damage ordinances with regard to construction within the floodplain. Neither project documented potential hydrologic or biological consequences of floodplain development. The California Department of Fish and Game reviewed both projects and had no significant objections to either.

Case 7 is a residential subdivision within the Coastal Zone. The approach used to protect a riparian zone within the subdivision was similar to the commercial project described above. The county coastal plan element required a streamside buffer in which development was precluded. A planned unit development approach was utilized to allow designing housing sites around the buffer. In this case, as in Case 1, on-site

investigation was used to define the buffer zone. The width of 100 feet recommended by the county coastal element was reduced to 50 feet.

There were two residential subdivisions with significant wetlands located in the watersheds of anadromous fish streams (Cases 3 and 4; Appendix B). In Case 3, the wetland was included within a "common" parcel to be owned and maintained by all future subdivision residents. A variety of other conditions were placed on that development for erosion control. Migration barriers were mentioned, as was the need for Department of Fish and Game approval for a crossing of an anadromous fish stream. Several mitigation measures proposed in the Initial Study and Negative Declaration, including some restrictions on grading and drainage, were not adopted as approval conditions, or at least not included in the approving resolution of the Board of Supervisors.

In Case 4, the wetland area was outside the subdivision but an access road for the subdivision was located directly adjacent to it. This was a much more intensive use than Case 3 (much higher density). Most attention was placed on erosion and sedimentation and the treatment of an on-site ephemeral creek. The Department of Fish and Game participated in the review of this project and suggested several conditions, including a protective buffer along the ephemeral creek, which were adopted on approval. There was no specific mention of potential impacts on anadromous fish in any documentation.

Case 5 is a public service use in the floodplain of a major river. The minimal documentation (Initial Study and Negative Declaration) accompanying the project indicated no consideration of anadromous fish or their habitat. Floodproofing of proposed structures was the only major issue raised.

Two projects involved residential subdivisions directly in the floodplains of anadromous fish streams. In Case 6 the effects of the project on anadromous fish were documented in a "biological evaluation." The Initial Study and biological evaluation suggested potential impacts on streamflow, erosion and sedimentation and water quality. Mitigation measures proposed to offset impacts included a buffer on the riparian zone which would preclude development, and prohibition of riparian water rights to new parcels. Neither of these is specifically included in the resolution approving the project but a rezoning to create the buffer was separately done. Two alternatives for providing water supply are stated in the resolution both of which involve wells. Although the biological evaluation states that shallow wells will have an insignificant impact on streamflow, no quantitative data are presented to support that conclusion. Furthermore, the impacts of deep wells are not addressed. The approving resolution states that National Marine Fisheries Service should make a determination on taking of listed fish due to the project prior to final map recordation. According to staff, NMFS made an informal no effect response but there is no public record of this.

Case 8 was a major subdivision involving the conversion of agricultural uses in a floodplain. The impacts of the project on anadromous fish are not addressed in any detail although hydrologic and water quality impacts received a great deal of attention. The staff report indicates several major impacts considered significant, but no Environmental Impact Report was prepared. Mitigation measures proposed were mainly concerned with flood protection but a 100 foot-wide buffer strip including the regulatory floodway and some riparian vegetation was established as an open space parcel. (This was rejected for dedication to the county.) Otherwise, the 100 year floodplain will be radically altered to bring housing elevations to a level above flooding. Some staff commented on the adverse effects of floodplain alteration on flooding and bank stability off-site. The Department of Fish and Game commented on this project, especially about the impacts of residents' access to the river and associated riparian zone. Fencing was proposed to mitigate these impacts.

In the several cases in which riparian zones or wetlands were reserved from development, no consideration was given to the issue of long-term management of the protected areas, given intensified human uses in their vicinity. This issue was brought up in Case 8. Islands of habitat are subject to edge effects and gradual loss of integrity. In Case 3, responsibilities were delegated to future residents who may have neither the knowledge or financial resources to manage the wetland. In Cases 1, 4, 6 and 7 no specific provisions were made for management of protective buffers. Case 8 included a fence to restrict access.

We observed one additional situation in which the residents of a subdivision were faced with the responsibility for a reserved streamside zone. Although not suitable as a case study, this project

demonstrates some lessons. The subdivision straddles a stream. When approved, the primary floodway was reserved from development and housing in the secondary floodplain was built to the elevation required by the county flood management ordinance. The stream was channelized with levees but the stream bottom was left natural. Over 10 years, riparian vegetation recruited into the floodway. This was alarming to residents who viewed the recruitment as impaired floodway capacity. Now, the residents are attempting to gain a permit to remove the vegetation and they are being denied because of the riparian habitat values. Providing specific guidelines for management of such areas in the future could avoid similar problems in the future.

Specific Conclusions and Recommendations

Environmental Review:

- Conclusion 3A: Review of eight case studies indicated that anadromous salmonids were explicitly mentioned in documentation only once, when a "biological evaluation" was performed.

- Conclusion 3B: The subject of anadromous salmonids is often referred to the Department of Fish and Game (i.e., expectations for review in the CEQA process) and in some cases, the Department is involved in permitting (i.e., 1600 stream alteration agreement process). Some counties even have requirements for Department review (sometimes within set time periods) in their general plans and ordinances. The quantity and quality of Department of Fish and Game participation has varied from county to county.

Recommendation 3A: Environmental review procedures for projects in floodplains of anadromous fish streams or other sensitive areas should be adjusted so that fisheries issues are considered early in the project planning process. CEQA Initial Study checklists should be revised to incorporate salmonid issues. Locations critical to salmonid habitat conservation should be identified by county staff in advance and trigger pre-consultation on projects located there, as is done in Del Norte County with Resource Conservation Area zones.

Recommendation 3B: Counties should consider ways to obtain consistent professional hydrologic and biological review of projects potentially affecting anadromous salmonids. The Department of Fish and Game and other state agencies are not necessarily dependable sources of timely input.

MITIGATION ASSESSMENT RESULTS

INTRODUCTION

Over 50 sites were formally evaluated in the five county study area and many more were observed in passing. Additional observations were made at case study sites. The activities observed and the mitigations applied appeared to be representative of the range of county regulated and sponsored projects in the region. Table 7 lists the projects visited by type of activity and location (note that some projects fit in more than one activity category):

Table 7: Number and Type of Activities Assessed

Type of Activity	Number of Sites Visited
Stream Crossings	15
Floodplain Development	10
Grading in Uplands	5
Routine Maintenance of Channels, Roads, Crossings	10
Remedial Treatments of Roads	6
Storm Water Management	2
Storage and Disposal of Road Surfacing Materials and Debris	4
Stream Bank Protection	3

Data forms and summaries for all of these activities are included in Appendix C. The following discussion presents the major findings of the field assessment.

STREAM CROSSINGS

The 15 stream crossings observed in the field included emergency structure maintenance and replacement, retrofitting fish passage facilities and standard operating procedures (Table 8).

Table 8: Locations of Assessed Stream Crossings

Activity #	County	Location	Activity Type
1	Siskiyou	Rail Creek	Emergency drainage structure replacement
2	Siskiyou	Barkhouse Creek	Emergency culvert replacement
3	Trinity	Canyon Creek	Emergency culvert replacement and slide repair
4	Humboldt	Slater Creek	Culvert Replacement
5	Del Norte	Lopez Creek	Emergency culvert replacement
6	Siskiyou	Deep Creek	Debris torrent road repair
7	Mendocino		Culvert repair
8	Del Norte	Jordan Creek	Culvert modification
9	Del Norte	Morrison Creek	Subdivision stream crossing
10	Del Norte	Yonkers Creek	Subdivision stream crossing
11	Mendocino	Parsons and	Instream grade control at bridge

		Morrison Creeks	
12	Mendocino	Ackerman Creek	Migration barrier mitigation
13	Del Norte	Rowdie Creek	Bridge reconstruction
14	Humboldt	Price Creek	Bridge replacement
15	Mendocino	Cave Creek	Low water crossing use and maintenance

Recent severe weather and flood damage throughout the five county region created the need to replace many culverts and some bridges which were destroyed. Several cases were observed in which these replacements were either undersized or potentially inadequate for fish passage. These were financed with funds from the Federal Emergency Management Agency (FEMA) or Federal Highway Administration Emergency Relief Program. According to county staff, general policy on use of these funds requires that damaged facilities be restored to pre-damaged conditions. Funding requirements restrict the ability of local agencies to upgrade facilities that were inadequately sized or poorly located, presenting migration barriers to fish. At least two of these crossings would probably be replaced with more permanent facilities in the future. One bridge was inadequately sized relative to the geomorphology of the stream and it was probable that additional bank armoring would be necessary to prevent bypassing the structure in the future. In most cases, DFG agreements were issued and conditions were placed on the projects. These typically addressed erosion and sedimentation and some included detailed provisions for fish passage. In emergency situations, normal requirements for review and by the Department of Fish and Game may be waived.

Replacement of culverts or low water crossings with bridges is desirable to enhance fish migration and to restore instream habitat. Despite the undersizing of the bridge mentioned above, the intention there was positive. We observed other sites where impacts on migration had been mitigated by installation of bridges. At one of these, poaching in a pool where fish had formerly stacked up had also been eliminated.

We saw instances where culverts had been replaced or modified (with baffles or fish ladders) specifically to enhance migration. In one of these, the positive effects of the modification may have been reduced by the practice used of concreting the culvert bottom to preserve its integrity. Department of Fish and Game personnel participated in the design of these modifications. In Humboldt County, manuals on culvert design for fish passage are utilized.

At two sites we observed the use of instream sills to control grade and scouring at bridges. This practice can create migration barriers. We saw several low water crossings with both hardened and natural bottoms. The natural bottomed crossings create chronic sources of suspended sediment and do not preserve instream habitat. They also are cleared and create points of thermal input to the stream. The hardened crossing we saw had a fish ladder and culverts for passing low to intermediate flows. It was breached only during floods.

Generally, impacts associated with crossings include sedimentation, instream habitat modification and migration barriers. Several of the projects visited were positive efforts aimed at reducing the impacts of existing facilities or replacing them. Problems are created by the emergency relief funding process, perhaps by lack of fisheries or geomorphology expertise in crossing design (especially for emergency replacements) and by practices such as culvert patching and lining with concrete.

To put these conclusions in perspective it is helpful to review the extent of activity related to crossings. Unfortunately, data for the counties are incomplete (Table 9).

Table 9: County Maintained Stream Crossings

County	Culverts	Bridges	Low Water Crossings
Del Norte	125	31	0
Humboldt	3000	162	3
Mendocino	Unknown	157	24
Siskiyou	Unknown	175	Unknown
Trinity	20-40**	99	3

** number of culverts on fish bearing streams only

Humboldt County is responsible for about 3000 culverts, 162 bridges and 3 low water crossings. It has replaced 4 bridges in the last 10 years. There have been 250 disaster-related projects in Humboldt County in the past 3 years, some of which involved crossings. Del Norte County is responsible for 31 bridges and over 125 culverts. It replaces or repairs about 10 culverts per year. The number of county-maintained culverts in Mendocino County is unknown, but there are 157 bridges and 24 low water crossings. Over the past ten years, Mendocino County has had 269 disaster-related projects of which over 80 were crossing-related. Mendocino County replaced 8 bridges over the past decade and anticipates replacing 13 more in the near future. It routinely replaces about 15 culverts per year. Trinity County is responsible for 99 bridges, an estimated 20 to 40 culverts on fish-bearing streams and three low water crossings. Over the past 10 years there have been about 235 disaster-related projects, including 62 culvert and five bridge replacements. Siskiyou County maintains approximately 175 bridges and an unknown number of culverts. There have been approximately 150 disaster-related projects in the last five years in Siskiyou County.

FLOODPLAIN DEVELOPMENT

In addition to the case studies involving floodplain development, 11 project activities were observed in the field (Table 10). Most case study sites were also visited.

Table 10: Locations of Floodplain Development Assessed

Activity #	County	Location	Activity Type
1	Trinity	Lance Creek	Commercial Development in floodplain
2	Mendocino	Feliz Creek	Commercial Development in floodplain
3,4,5	Del Norte	Smith River	Single home development in floodplain
6	Mendocino	Feliz Creek	Subdivision in floodplain
7	Del Norte	Smith River	Subdivision above floodplain
8	Humboldt	Eel River	Road maintenance in floodplain
9	Del Norte	Klamath River	Road reconstruction in floodplain
10	Humboldt	Price Creek	Road reconstruction in floodplain
11	Mendocino	Eel River	Levee replacement

In all of the counties there is a legacy of development located on floodplains or in other areas where detrimental effects on fish and/or water quality occur. We observed some attempts to reverse existing conditions as well as approaches to management of new development (see case studies also). No matter how well-designed a floodplain development is, there are still attendant impacts on stream processes and habitat. We also observed some poor land use practices, apparently due to lack of regulatory control.

The level of control on floodplain development varies from county to county and even within counties depending on whether or not the site is subject to Coastal Zone regulations. We were not able to obtain any specific data on the number of recent or pending projects in floodplains. The willingness of landowners to go beyond the minimum in environmental protection has an effect on impacts. In one existing commercial development and one proposed residential subdivision we saw, stream conditions and fish habitat were virtually ignored. Impacts associated with these projects include streamflow modifications (increased peak floods), riparian clearing, sedimentation, instream habitat modification, thermal and chemical pollution and migration barriers. When these impacts are associated with existing development they are largely irreversible.

We observed one instance where unauthorized filling had occurred in a floodplain. Apparently, the landowner had been approached by CalTrans seeking a site for disposing of landslide material. The landowner had consented to the disposal in anticipation of future development. Later, the county had taken an enforcement action against the landowner.

Setbacks from floodways and riparian zones were observed as features in some recent projects. These took the form of zoning actions or restrictions on development. In one project, a combination of riparian

setbacks, retention basins and balanced cut and fill in the floodplain had been used to mitigate flooding effects on the development and preserve, in part, the stream riparian zone. Drawbacks of this project included the use of exotic plants for landscaping and the possibility that stream migration in the future may necessitate bank armoring.

We observed three road reconstruction projects in floodplains. In all three cases, the roads are poorly located right adjacent to streams and they experience periodic damage from flooding, erosion or inner gorge landslides. Two of these roads serve very limited uses but are maintained due to historic county policies on access. Impacts of road reconstruction and use in these locations primarily are sedimentation associated with regrading and inboard ditches.

We saw one levee reconstruction project where the purpose of the levee was for controlling flood debris. No significant adverse effects are associated with that activity. At the present time, Humboldt County maintains about 4 miles of levee. Del Norte County maintains about 2 miles of levee on the Klamath River. Trinity County maintains about 6 miles of levee. There are no county-maintained levees in Mendocino County. Virtually no new levees are being constructed by the counties.

As illustrated here and in the case studies, fisheries issues rarely supercede flooding issues in floodplain development. Some of the policies and procedures used in the five county region are useful models for all the counties. Nevertheless, the strategy of avoiding development within the meander belt or geomorphic floodplain of streams is not presently used anywhere in the region.

REMEDIAL TREATMENTS

Remedial treatments are defined here as efforts to reduce or eliminate existing sources of sediment, including roads and slope instability (Table 11). They will usually have positive effects on fish and their habitat. The counties generally do remedial treatments when public infrastructure is involved. We observed only one remedial project undertaken specifically to reduce erosion rates from roads, the French Creek project. This project was a cooperative effort between Siskiyou County and local landowners and federal agencies, and has received national recognition for its cooperative approach and demonstrated reduction in sedimentation rates. There is also a large number of restoration projects in the five county region which have been done by other governmental and non-governmental agencies and which were not within the scope of our review.

Table 11: Locations of Remedial Treatments Assessed

Activity #	County	Location	Activity Type
1	Siskiyou	Scott River	Slide repair
2	Mendocino	Big River	Emergency slide repair
3	Del Norte	Smith River	Emergency slide repair and spoils disposal
4	Siskiyou	Klamath River	Slide repair
5	Trinity		Emergency repair of road washout
6	Siskiyou	Rattlesnake Creek	Floodplain road relocation
7	Siskiyou	French Creek	Gravel road reconstruction

STORM WATER MANAGEMENT

All development projects (residential, commercial, industrial) generate increased runoff and non-point source pollution from impervious surfaces. These modify streamflow, possibly causing erosion or exacerbated flooding, and impair water quality. We observed several approaches taken to manage storm water runoff including filter strips between development and streams, riparian setbacks and retention basins. Retention basins serve the dual purpose of temporary storage of runoff and pollutant sinks. They are a positive feature of new development but are not used consistently throughout the five county region. We saw two examples associated with commercial development, both in Del Norte County. We also saw

retention basins in new residential developments. One unresolved issue related to these facilities is disposal of accumulated sediments which may contain hazardous contaminants.

GRADING IN UPLANDS

We conducted field reviews at five residential development sites (Table 12). Creating roads and building pads on hillslopes pose potential problems for downstream receiving waters. There are differences in practices depending on the type of development and where it is. None of the counties has a comprehensive grading ordinance. Restrictions on grading are implemented through development review, subdivision regulations and the Uniform Building Code.

Table 12: Locations of Upland Grading Activities Assessed

Activity #	County	Location	Activity Type
1	Trinity		Development of existing lot on 100% slope
2	Del Norte	Smith River	Private road construction on steep slopes
3	Mendocino	Gold Gulch	Grading on approved lots
4	Trinity	Weaver Creek	Subdivision grading
5	Humboldt	Ryan's Creek	Subdivision grading

Four of the five projects showed inadequate regulation of grading on approved lots in residential subdivisions. Vegetation clearing and grading on individual lots was uncoordinated and persisted through the rainy season. Barren surfaces were subject to erosion and caused downstream sedimentation. In at least one case, vegetation adjacent to a minor tributary to a fish-bearing stream had been removed and erosion was occurring.

One subdivision was observed in which grading had occurred during winter, creating erosion and downstream sedimentation. In addition, cut had exceeded fill on the site and off-site disposal of excess material was necessary. The amount of excess soil was substantial. Silt fences and hay bales had been installed in an attempt to mitigate erosion at the storage site.

In the one case in which a more controlled grading approach had been utilized restrictions on road and building locations may prevent some future impacts. However, since each lot will be individually developed, there may be prolonged soil exposure and resulting sedimentation.

STORAGE AND DISPOSAL

Storage and disposal of road surfacing materials, soil and debris was formally evaluated at four locations but casually observed throughout the study area (Table 13). The recent weather in the five county region has contributed to a large number of landslides and road failures. For example, in Mendocino County alone there have been over 150 landslides and slips above and below county-maintained roads in the past 10 years. In Trinity County, there have been 175 road-related landslides and washouts in the past 10 years. Consequently, there has been an increased demand for sites to store soil and debris. This is handled differently from county to county. Also, other agencies, such as CalTrans and USDA-Forest Service, have their own sites and procedures for disposal, some of which may conflict with local procedures.

Table 13: Locations of Spoils Storage And Disposal Assessed

Activity #	County	Location	Activity Type
1	Del Norte	Smith River	Emergency slide repair and spoils disposal
2	Mendocino	Gold Gulch	Grading on approved lots
3	Siskiyou	Moffett Creek	Stockpiling of road surface material
4	Mendocino	Feliz Creek	Subdivision in floodplain

Of the examples we observed, one was associated with a subdivision (mentioned above), two were related to landslide debris and one was a storage site for road surfacing materials. Generally, in streamside locations where road grading or landslide removal are occurring efforts are made to either end-haul materials to safe disposal sites or to prevent sidecast into the stream. Storage sites along streams are commonly bermed or otherwise treated with control measures to prevent sedimentation. Borrow sites or storage sites are regraded and planted after use. Storage sites in upland locations, away from streams are the policy in at least one county.

We observed one instance in which landslide debris was being used as fill on a steep slope above a stream (not assessed as an activity). We were unable to judge whether or not adequate protections were being applied to prevent failure of the fill and subsequent sedimentation. This was apparently an ad hoc solution of a contractor to a disposal problem.

STREAM MODIFICATION

We visited three projects involving rip-rap bank protection to prevent road failures. We observed many more examples of this practice throughout the five county area. Rip-rap is commonly used on the outside of meander bends, at culvert mouths, and at bridge abutments to prevent erosion. Less commonly, it is used as a protective measure on straight stream reaches where the road is very close to the stream. Generally, installation of rip-rap usually has minor sedimentation impacts. Unless an emergency situation, these impacts are subject to mitigation through the DFG agreement process. Common mitigation measures applied include restriction of work to low flow periods and temporary diversion of streamflow away from the construction site.

The long-term impacts of rip-rapping stream sections can include transfer of erosional energy to other unprotected parts of the stream with consequent impacts. This can cause changes in off-site instream habitat.

ROUTINE MAINTENANCE

Routine maintenance in the five county region is somewhat problematical since most maintenance over the past several years has been associated with emergency responses to storm and flood damage. The counties have responsibilities for maintaining flood control structures and roads (Table 14), although we were not able to obtain complete data on the scope of those activities.

Table 14: Miles of County Maintained Roads, Levees, and Flood Control Channels

County	Miles of Road	Sufaced Road Miles	Unsurfaced Road Miles	New Road Miles Constructed/Year	Levee Miles	Flood Control Channel Miles
Del Norte	300	199	101	0	2	10.5
Humboldt	1207	907	300	3	4	1.5
Mendocino	1018	606	412	0.25	0	0
Siskiyou	1364	808	556	1	Unknown	3.5
Trinity	718	318	400	0.1	6	5

As indicated in Table 14, the amount of flood control structures maintained by counties is relatively small. Virtually no new flood control structures are being built at present. Mendocino County reports no maintained floodway but we are not certain about that.

For all the counties, the amount of unpaved roads ranges from about 25 to 55 percent of the total maintained miles. The level of maintenance activity varies from county to county and lately has been largely driven by emergency response. In all counties, new road construction or reconstruction is extremely limited.

We formally assessed 10 typical maintenance activities and made casual observations at numerous other locations (Table 15).

Table 15: Locations of Routine Maintenance Practices Assessed

Activity #	County	Location	Activity Type
1	Mendocino	Howell Creek	Routine flood control maintenance
2	Humboldt	Price Creek	Channel clearing
3	Trinity	Sydney Gulch	Emergency channel clearing
4	Trinity	Weaver Creek	Levee maintenance
5	Siskiyou	Scott River	Bridge repair
6	Trinity	Dutch Creek	Gravel road maintenance
7	Del Norte	Patrick Creek	Gravel road maintenance
8	Siskiyou	Moffett Creek	Gravel road maintenance
9	Siskiyou	Klamath River	Gravel road maintenance in floodplain

10	Trinity	Dutch Creek	Road abandonment, termination of maintenance

Generally, channel and culvert cleaning procedures are aimed at protecting against property damage during floods. This is a liability issue to the counties and their responses are logical. We observed some examples of relaxed policies on debris removal and vegetation clearing. Bridge maintenance or replacements not involving work on stream banks or in the stream would appear to have minimal impacts.

There are some county roads located in streamside zones that would never be built today. County road maintenance procedures are relatively sensitive to fisheries issues but design standards (size of road surface and drainage) create chronic sources of sediment. Some counties have chosen to change or modify their design standards in streamside areas to reduce impacts. The practice of termination of maintenance (not road abandonment) without provisions for control of future erosion may present a serious problem in the future due to declining maintenance budgets.

Summary Of Conclusions And Recommendations
Development Impact Avoidance:

- Conclusion 4A: Some case studies, field reviews and county data indicate that floodplain development, grading on upland sites, and urban runoff have impacts on fish and their habitats.

- Conclusion 4B: Field review indicated that counties were able to avoid salmonid habitat impacts in some cases through use of riparian setbacks, storm drainage control (e.g., retention basins), grading and erosion controls and restrictions on water supply to new development. The authorities for these measures included floodplain management, natural hazard and grading ordinances.

- Conclusion 4C: There is minor activity in new road construction and flood control channel construction at present, but if these increase in the future due to accelerated growth, adequate mitigation procedures need to be in place.

Recommendation 4: Counties should continue to use all available tools to prevent development within riparian zones and floodplains. Avoiding location of development in these areas should be a priority over mitigating developments in these areas.

Development Mitigations:

- Conclusion 5A: Development design incentives and other practices to protect fish and their habitats are implemented as mitigations to development through the CEQA process. Techniques such as density transfer, flexible lot size, and flexible road standards were used to create or maintain open space and riparian corridors. In addition we saw subdivisions where riparian water rights were not permitted, and individual building sites where wetlands were preserved and where retention basins were used to control runoff quality and quantity.

- Conclusion 5B: Grading standards for new developments were not adequate to minimize the potential for sedimentation. In particular, winter grading or overwintering of exposed soils resulted in off-site migration of sediment.

Recommendation 5A: Formation of a five county technical workgroup focused on exchange of information could capture innovative practices and procedures. These could then be implemented more consistently as mitigations through the CEQA process.

Recommendation 5B: The counties should explore mechanisms to curtail winter grading, such as grading ordinances, or standardized mitigations on grading imposed through the CEQA process.

Riparian Corridor Maintenance:

- Conclusion 6: In several instances we observed riparian corridors and wetlands reserved from development, with no explicit standards provided for their long-term maintenance or management.

Recommendation 6: The counties should develop specific standards for long-term management of riparian corridors that may be adopted as development conditions or covenants, codes, and restrictions.

County Maintenance Mitigation Practices:

- Conclusion 7A: Given the legacy of infrastructure and staffing and funding limitations, most county maintenance activities including culvert and bridge replacement, storage of spoils and road maintenance appear reasonably respectful of fish.

- Conclusion 7B: Enhanced erosion control practices and improvements in road design were observed in some counties and are positive examples of improved maintenance practices.

- Conclusion 7C: The lack of written road and bridge maintenance policies and procedures makes it difficult to determine if practices which contributed to protection and/or maintenance of fish habitat and water quality are standard operating procedures or extraordinary efforts of individuals.

Recommendation 7A: Some maintenance procedures can be improved, especially through implementation of the five county workgroup and training, previously described.

Recommendation 7B: Road and bridge maintenance policies should be institutionalized so that they become standard organizational practice, rather than the result of individual initiative.

Recommendation 7C: There should be a continuing emphasis on education and training of personnel in biological resources management. Exceptional cases of fish friendly road improvements already existing in the counties, such as Siskiyou county's French Creek project, should be used as examples.

County Infrastructure Upgrading:

- Conclusion 8A: In the majority of maintenance and emergency response cases observed, problems were due to the inheritance of county roads and bridges located near streams or other sensitive areas.

Recommendation 8A: The counties should consider conducting an inventory of roads, culverts, and bridges located in or near anadromous fish streams and determine which could be economically relocated or eliminated without a significant loss of public benefit.

Recommendation 8B: In cases where county roads are to be terminated or abandoned, provision should be made for erosion control and drainage.

State And Federal Leadership:

- Conclusion 9A: Certain state and federal procedures prevent or hinder counties from improving facilities to benefit salmonid habitat during reconstruction or replacement. These include FEMA funding requirements, federal and state road standards, and the US Army Corps of Engineers standards for management of flood control structures.

- Conclusion 9B: In particular, the manner in which roads and culverts damaged by floods, landslides, and debris flows may be repaired is constrained by federal emergency relief funding procedures. Specifically, emergency funding does not allow for upgrading these structures to improve fish habitat or avoid future risk, creating the potential for additional habitat impacts in subsequent emergencies.

Recommendation 9A: Federal and state agencies need to take the lead in improving their own guidelines and standards for fish-friendly practices. Specifically, FEMA should amend its reconstructed as built requirements for roads and bridges to be more fish friendly. Fish-friendly alternatives to generic CalTrans

and ASHTO road standards should be developed. The US Army Corps of Engineers should work with counties to current levee maintenance agreements to be more conservative of fish habitat.

SUMMARY

In this study we reviewed county general plans and ordinances for the five California counties within the Transboundary Evolutionarily Significant Unit of the coho salmon to determine what protections they afford to anadromous salmonids and their habitats. We also reviewed eight typical land development projects to see how anadromous salmonids are treated in the environmental review process. Finally, interdisciplinary teams visited over 50 sites on the ground to evaluate typical activities and implementation of mitigation measures at the project level.

On the basis of this study we found that:

The policy framework for protecting anadromous salmonids and their habitats is incomplete; only one county has specific policies in its general plan. Other counties have protections in place in their Coastal Zones.

In the absence of general plan policies and ordinances, counties address the impacts of land development through implementation of the California Environmental Quality Act (CEQA). Effectiveness of CEQA process is variable.

In the past, development and infrastructure within the counties has sometimes been located in riparian zones and floodplains. Maintenance and emergency response to these facilities continues to pose risks to anadromous salmonids.

Current policies on development and infrastructure siting are an improvement on past practices, with counties using a variety of tools to exclude development from riparian zones and floodplains. However, these efforts are inconsistently applied throughout the five county region, allowing development in these critical areas, with attendant impact and risk for salmonid habitat.

Funding appears to limit the maintenance and upgrading of county roads and bridges. Continued declines in county funding may cause curtailment of maintenance in the future, exposing salmonid habitat to future risk.

The counties' ability to incorporate of fish-friendly practices into disaster-related emergency repair to their public infrastructure is hampered by federal and state funding policies.

Although there are no written policies on road and bridge maintenance, there are innovative problem-solvers in the counties employing habitat conservation mitigations.

APPENDIX A: COUNTY ACTIVITIES POTENTIALLY AFFECTING ANADROMOUS SALMONIDS

1. Components of Activities with Potential Impacts:

    a. Construction
        - Site clearing
        - Grading
        - Culvert installation
        - Bridges
        - Roads
        - Levees
        - Artificial channels
        - Channel structure installation
        - Retention basins/overflow channels

    b. Recurring Maintenance/Emergency Response
        - Emergency grading
        - Street sweeping
        - Road watering or other activities requiring water withdrawals from stream
        - Culvert clearance/repair
        - Bridge repair
        - Road sanding
        - Snow plowing
        - Road regrading/resurfacing
        - Channel clearing
        - Levee repair
        - Floodplain clearing
        - Erosion control (e.g., rip-rap)
        - Landslide removal
        - Herbicide spraying
        - Roadside brushing

    c. Long Term Use-Related
        - Habitat loss/reduction
        - Domestic water use/stream drawdown
        - Storm drainage
        - Waste water discharge
        - Direct taking
        - Domestic animals (e.g., horses)

2. Activities Grouped by Impact Categories

    a. Streamflow Quantity Modifications
        - Road watering
        - Road surfacing (impervious surfaces)
        - Retention basins/overflow channels
        - Domestic water use

Storm drainage

b. Riparian Clearing
- Habitat loss/reduction
- Roadside brushing
- Floodplain clearing
- Channel clearing
- Levee construction
- Channel construction
- Site clearing

c. Sedimentation
- Grading
- Culvert installation
- Bridge construction
- Emergency grading
- Street sweeping
- Culvert clearance/repair
- Bridge repair
- Road sanding
- Road regrading/resurfacing
- Channel clearing
- Levee repair
- Landslide removal

d. Instream habitat modification (physical)
- Habitat loss/reduction
- Erosion control and channel armoring
- Channel clearing
- Retention basins/overflow channels
- Channel structure installation
- Direct taking

e. Water quality impairment (thermal, biological or chemical)
- Site clearing
- Channel structure installation
- Road watering
- Street sweeping
- Snow plowing
- Channel clearing
- Floodplain clearing
- Herbicide spraying
- Storm drainage
- Waste water discharge
- Domestic animals

f. Migration barriers
    Channel structure installation
    Retention basins/overflow channels
    Channel construction
    Culvert installation

This comprehensive list was the basis for consultation with each county to determine which of these are most common or the most important. It was expected that some activities might be important in some counties and not others. It was improbable that all, or even most, activities would be important in any one county.

APPENDIX "B"

CONTENTS

DEVELOPMENT PROJECT REVIEW SURVEY FORM - CASE 1

PROJECT DATA
Name: McMurray Mini-storage

Location (attach map): Crescent City

Dates of development review: Field review June, 1998; Office review August, 1998

Type of project: Commercial-warehousing

General project description (include major activities and phasing, if relevant):
Project involved a use permit, rezoning and building permit for a mini-storage facility. Project is located in Coastal Zone and a coastal development permit was required. The rezoning was for a portion of the property from "General Resource Conservation Area" to "Designated Resource Conservation Area." These classifications pertain to sensitive environmental locations within the Coastal Zone.

Was the project completed? When? 1988.

Is the project located in or near a stream which supports or could support anadromous fishes? What is the name of the stream?

Yes. The site is located on a tributary to Elk Creek, a year-round spawning stream.

List the chronology of development processing:

Date submitted to county: Summer, 1987
Date of acceptance by county: Fall, 1987
Environmental Impact Report required? No.
Negative Declaration filed? Yes.
Dates of public hearings (if any): November, 1987
Date of approval: November, 1987
Date of project completion: 1988

Relevant county policy documents applied or published:

Relevant General Plan Elements and policies: The General Plan designates this property for "Light Industry/Heavy Commercial" uses and "Resource Conservation Area." The Resource Conservation Area designation is exclusively applied to sensitive environmental sites within the Coastal Zone.

Zoning ordinance: Property was zoned C-4, Heavy Commercial, and RCA-1, General Resource Conservation. Rezoning was to determine specific boundaries for the "Designated Resource Conservation Area" on the site. This is done through field studies and mapping.

Subdivision ordinance: N/A

Environmental Impact Report: N/A

Others (describe): Rezoning required amendment of Del Norte County's Local Coastal Plan.

COUNTY PROCEDURES

Were any of the following impacts predicted to occur as a result of the project? Cite source for predicted impacts (e.g., environmental documents, report of planning staff, planning commission or board of supervisors findings).

Streamflow quantity modifications: Located in flood-prone area (source: Initial Study).

Riparian clearing: No (source: Initial Study).

Erosion and sedimentation: No (source: Initial Study).

Instream habitat modification (physical): No (source: Initial Study).

Water quality impairment (thermal, biological or chemical): Possible nonpoint source pollution (source: Department of Fish and Game comments on Negative Declaration).

Migration barriers: No (source: Initial Study).

What mitigation measures were proposed to offset impacts? Cite the authorities for the mitigation measures. (Attach additional sheets as necessary):

The major mitigation applied was the site-specific mapping of the "resource conservation area" based on topography, flood hazard, vegetation and soils. Defining this area has the effect of excluding it from development. In the subject development, the exclusion included a tributary stream and associated riparian vegetation ranging in width from 20-50 feet.

To offset potential nonpoint source pollution impacts, the Department of Fish and Game recommended the use of a filtration device or a means of diverting runoff away from the designated resource conservation area.

What (if any) permits were required by other agencies? What mitigation measures were recommended to offset predicted impacts? (Attach additional sheets as necessary)

Coastal Development Permit from Regional Coastal Commission. The RCA zoning is an implementation measure for the Local Coastal Plan.

IMPLEMENTATION
Which mitigation measures adopted as conditions to project approval?
The rezoning is a form of mitigation and was the basis of project approval. In addition, "a 10 foot wide grass buffer shall be planted and maintained between the paved driveway area and the riparian habitat..." to offset nonpoint source pollution impacts.

Which mitigation measures were not adopted?
None proposed that were not adopted.

Were mitigation measures carried out? If not, will they be carried out in the future? Cite sources for this information.
Field review and mapping indicated that the mitigation measures were successfully implemented.

What county departments or other agencies were responsible for implementation?
County Community Development Department, Regional Coastal Commission.

SUMMARY
This project demonstrates the use of critical area zoning to protect riparian and stream habitats. Prohibition of development in the RCA zone does not preclude other uses such as timber harvesting, subject to other permitting procedures. Any stream modifications would be subject to Department of Fish and Game permitting.

Del Norte County does not presently apply the RCA concept outside of the Coastal Zone but that may be proposed in the current phase of General Plan updating.

REVIEWERS NAME AND DATE OF SURVEY: Richard Harris, August 4, 1998
DEVELOPMENT PROJECT REVIEW SURVEY FORM - CASE STUDY 2

PROJECT DATA
Name: Marble Mountain Stud Mill

Location (attach map): Siskiyou County

Dates of development review: Field review May, 1998, Office review July, 1998

Type of project: Use Permit for industrial development.

General project description (include major activities and phasing, if relevant):
This project was originally approved in 1989. It was reconsidered in 1990 due to a change in one use permit condition. At the present time, there is no activity on the site but it is possible that the use will be reestablished. This review pertains to the use and conditions placed on the use.

Was the project completed? When?
Project was constructed sometime after 1989 and continued in operation until about 1997.

Is the project located in or near a stream which supports or could support anadromous fishes? What is the name of the stream?
Yes. The project site is in the floodplain of Moffett Creek.

List the chronology of development processing:
- Date submitted to county: 1988
- Date of acceptance by county: 1988
- Environmental Impact Report required? No
- Negative Declaration filed? Yes
- Dates of public hearings (if any): November, 1988

Date of approval: November, 1988
Date of project completion: 1989 ?

Relevant county policy documents applied or published:

Relevant General Plan Elements and policies: Staff report indicates that the General Plan designates the area as having soil erosion hazard. It is within the floodplain of Moffett Creek, within Critical Deer Wintering Range and within a wild fire hazard area. Staff report further indicates that the project "is in conformance with all applicable elements and policies of the Siskiyou County General Plan."

Zoning ordinance: Timber Production Zone
Subdivision ordinance: N/A
Environmental Impact Report: None.
Others (describe): Use Permit required under provisions of zoning ordinance.

COUNTY PROCEDURES

Were any of the following impacts predicted to occur as a result of the project? Cite source for predicted impacts (e.g., environmental documents, report of planning staff, planning commission or board of supervisors findings).

Streamflow quantity modifications: Soil compaction and development will reduce absorption rates but "sufficient room for natural drainage will still exist once the improvements are in place. No mitigation measures are necessary." (source: Initial Study) Applicant possesses adjudicated water rights for diversion and use of water from Moffett Creek (source: Use Permit Application)

Riparian clearing: Development "will eliminate some native grasses." (source: Initial Study)

Erosion and sedimentation: No (source: Initial Study).

Instream habitat modification (physical): No (source: Initial Study).

Water quality impairment (thermal, biological or chemical): There is a risk that hazardous materials and/or processing wastes could pass into Moffett Creek (source: Initial Study).

Migration barriers: Development will occur within the 100 year floodplain of Moffett Creek (source: Initial Study). A new bridge will be built on Moffett Creek.

What mitigation measures were proposed to offset impacts? Cite the authorities for the mitigation measures. (Attach additional sheets as necessary): See below.

What (if any) permits were required by other agencies? What mitigation measures were recommended to offset predicted impacts? (Attach additional sheets as necessary)
No permits required from Department of Fish and Game. Letter in file indicates that "...the berm will provide adequate protection and will prevent woody material from entering Moffett Creek during periods of high water." See condition 29, below.

The North Coast Regional Water Quality Control Board recommended several mitigation measures which were all included as conditions to project approval. See conditions 21-24, below.

IMPLEMENTATION

Which mitigation measures adopted as conditions to project approval?
A total of 40 conditions were imposed on the project at the time of approval and these remain in effect at the present time (number 40 was modified in 1990). Of these, the following pertain to environmental impacts on Moffett Creek:

6. All on-site fuel storage facilities...shall be placed outside the 100 year floodplain of Moffett Creek and have adequate containment facilities to prevent spills into surface or groundwaters.

7. ...the applicant shall provide a handling procedure for any waste oil or other hazardous materials...

8. The placement of organic, inorganic, slash, bark, wood chips or earthen materials...at locations where such material could pass into Moffett Creek...shall be prohibited.

10. Prior to the issuance of the use permit, the applicant shall enter into an agreement with the Public Works Department for the construction of a new bridge over Moffett Creek...

11. Prior to the issuance of the use permit, the applicant shall enter into an agreement with the Public Works Department for annual dust control...on East Moffett Creek Road and on Scarface Road...

15. All future construction within the floodplain of Moffett Creek shall be in accordance with the Siskiyou County Flood Damage Prevention Ordinance.

16....The log deck and parking areas shall be graveled and maintained in order to reduce dust and for soil erosion control.

17. ...All septic tank and leachfield systems shall be placed at least 100 feet from the bank of Moffett Creek.

20. The applicant shall designate a fueling and fuel storage area...acceptable to the Department of Fish and Game...and the North Coast Regional Water Quality Control Board...

21. The applicant shall either construct retention ponds...which will hold all log deck rainfall runoff received during the winter for use in sprinklers in the summer; or the applicant shall be prohibited from log deck sprinkling.

22. ...retention ponds shall be certified as acceptable to the North Coast Regional Water Quality Control Board.

23. The applicant shall either pave the log handling areas or ....annually cleanup and remove any unsold contaminated log by-products to an approved solid waste disposal site.

24. The applicant shall submit a report of waste water discharge regarding storm water runoff to the North Coast Regional Water Quality Control Board.

29. The log and lumber storage area shall be separated from Moffett Creek by...berm or other means acceptable to the Department of Fish and Game...to protect (them) during flood events.

30. ...the berm, cutbanks and soil spoils shall be seeded and mulched...

32. No water shall be diverted from Moffett Creek for mill operations.

33. The applicant shall remove all slash and woody waste materials from the log and lumber storage area at least once a year.

39. The applicant shall provide on-site water storage...for fire suppression...

Which mitigation measures were not adopted? None.

Were mitigation measures carried out? If not, will they be carried out in the future? Cite sources for this information.
Inspections by the county indicated that all 40 conditions either had been met, were associated with performance or would be met upon project start-up (source: letters from Planning Department to project applicant).

What county departments or other agencies were responsible for implementation?
Planning Department, Public Works Department, Public Health Department, CalTrans, Department of Fish and Game, Regional Water Quality Control Board, Air Pollution Control District.

SUMMARY

This is an example of a floodplain development in which the majority of the mitigation measures dealt with reducing water pollution potential. No mitigation for possible damage to the riparian zone from intensified uses or impacts of development on floodflow quantities or routing were proposed. Impacts on anadromous fish or their habitats were not mentioned in any documentation. During field review several issues were raised which were not addressed in the original project review. The use permit has no time limit and as such, is irrevocable unless an enforcement action occurs. The ramifications of this relative to listing of endangered salmonids subsequent to approval are unknown. There are no conditions or limitations on riparian habitat clearing. Use of water from an on-site well or withdrawal of streamflow from Moffett Creek could have adverse effects on fish habitat. Should there be additional restrictions placed on the use now that anadromous fish are at risk? Another issue not raised during the original review process was the effects of continued use and maintenance of Moffett Creek Road which is located directly adjacent to the stream.

REVIEWERS NAME AND DATE OF SURVEY: Richard Harris, July 30, 1998

DEVELOPMENT PROJECT REVIEW SURVEY FORM - CASE STUDY 3

PROJECT DATA

Name: Zabel subdivision

Location (attach map): Weaverville area

Dates of development review: Field review April, 1998, Office review August, 1998

Type of project: Residential subdivision

General project description (include major activities and phasing, if relevant):
Subdivision of a 60 acre site into 24 residential lots plus a common area. Roads and driveways will be constructed as part of the project. Water and sewage treatment to be provided by sanitary district and public utilities district. Lots will be developed individually.

Was the project completed? When? No.

Is the project located in or near a stream which supports or could support anadromous fishes? What is the name of the stream?
Yes. The project site is within the watershed of Sydney Gulch. It drained by China Gulch and several ephemeral streams and has a significant wetland.

List the chronology of development processing:

Date submitted to county: early 1997
Date of acceptance by county: May, 1997 (?)
Environmental Impact Report required? No.
Negative Declaration filed? Yes.
Dates of public hearings (if any): June-July, 1997
Date of approval: June-July, 1997
Date of project completion: N/A

Relevant county policy documents applied or published:

Relevant General Plan Elements and policies: Project site is in the Weaverville Community Planning Area. It is designated for Rural Residential uses.

Zoning ordinance: Project is consistent with the RR-2.5 zoning designation (rural residential, 2.5 acre minimum lot size) with the exception that some smaller lots were permitted to enable preservation of a wetland area.

Subdivision ordinance: The subdivision is consistent with the Subdivision Ordinance (source: staff report).

Environmental Impact Report: N/A.

Others (describe): A "Notice of Environmental Constraint" was recorded to enable continuous protection of a wetlands/riparian common area (see below).

COUNTY PROCEDURES
Were any of the following impacts predicted to occur as a result of the project? Cite source for predicted impacts (e.g., environmental documents, report of planning staff, planning commission or board of supervisors findings).

Streamflow quantity modifications: "Construction of roads and homes will change absorption rates over approximately 17 acres...The impacts of this development and increased runoff rate will be minimized by the use of drainages sized to accommodate the anticipated flows, development of sediment retention basins and requirements to discharge runoff into vegetation or less erodible materials" (source: Initial Study).

Riparian clearing: "Both road and homesite development could result in substantial impacts to (on-site) wetlands if appropriate measures are not taken" (source: Initial Study)

Erosion and sedimentation: "Evidence of slope failure was noted on-site following the winter storms of 1997..." (source: Initial Study)

"Soil erosion potential is low for these (on-site) soils...An exception... is the wetland portion of the subdivision area...which ha(s) developed due to the impervious clay layer and the construction of an earth dam near the confluence with Sydney Gulch." (source: Initial Study)

"The potential for shallow debris slides from road construction is high for slopes over 40 percent...The potential areas of failure are limited, however, by the small portion of road construction in these areas..." (source: Initial Study)

"Changes in ground surface topography will be limited to the development of cut and fill slopes associated with road construction and some homesite pads..." (source: Initial Study)

"Temporary increases in fugitive dust...may affect homes located (nearby)..." (source: Initial Study)

Instream habitat modification (physical): "The longest and largest fill slope will be located in the northeast corner of the subdivision and will cross a small ephemeral draw." (source: Initial Study)

"The access route to the subdivision will require crossing Sydney Gulch and a series of smaller ephemeral stream channels...Sydney Gulch within the project area is not currently Coho salmon habitat, but is located upstream of known habitat. Two migration barriers located downstream of the project may eventually be modified to allow passage into this portion of the stream system." (source: Initial Study)

Water quality impairment (thermal, biological or chemical): Not discussed in the Initial Study. Potential for soil erosion and nonpoint source water pollution raised in comments by the Regional Water Quality Control Board.

Migration barriers: See above comments regarding Sydney Gulch.

What mitigation measures were proposed to offset impacts? Cite the authorities for the mitigation measures. (Attach additional sheets as necessary):
The Initial Study and Negative Declaration included a list of 19 mitigation measures (see discussion, below).

What (if any) permits were required by other agencies? What mitigation measures were recommended to offset predicted impacts? (Attach additional sheets as necessary)

Crossing of Sydney Gulch would require a stream alteration agreement with the Department of Fish and Game (not yet obtained).

The Regional Water Quality Control Board requires a General Construction Storm Water Permit for urban developments over five acres. Provisions of that permit prohibit discharges or placing of "soil, silt, bark, slash, sawdust, etc. into or in locations where it could pass into any stream or watercourse...in quantities deleterious to fish, wildlife or other beneficial uses..."

IMPLEMENTATION
Which mitigation measures adopted as conditions to project approval?
Five pages of conditions on the development are included in the Board of Supervisors' resolution approving the subdivision. Pertinent ones include:

"10. a. 4) Roads exceeding 5 percent grade shall have sediment retention basins and other erosion controls on the cut slope sides..."

"10. a. 9) A 1603 Streambed Alteration Agreement shall be obtained from the CA Department of Fish and Game for stream crossings. The crossings shall be designed and sized for a 100 year flood event and fish crossing."

"10. e. An engineered grading, drainage and erosion control plan...shall be provided."

"10. g. 1) The wetlands/riparian common area...shall...be designated as unbuildable."

"10. g. 2) A 30 foot upland buffer area surrounding the wetland...shall be designated as unbuildable."

"10. g. 3) ...a property owners association shall include in its responsibilities 'the maintenance of the wetland and riparian area'..."

"10. i. 1) A storm water discharge permit...shall be obtained and incorporated into the drainage, grading and erosion control plan."

"10. j. A 'Notice of Environmental Constraint' shall be recorded as follows: 'a property owners association has been created for the purposes of maintaining the wetlands/riparian common area owned in common by all property owners in the subdivision. It shall not be developed, destroyed or degraded'."

Which mitigation measures were not adopted?
The Initial Study and Negative Declaration for the project list 19 conditions. Review of this list in comparison to the list in the approving resolution indicates that some specific measures were not included in the resolution. These include:

"All earth-moving activities shall be prohibited from November 1 through April 15..."

"On slopes greater than 20 percent that lead directly to the designated (wetland) and on all slopes greater than 40 percent, roads and extension of public utilities shall be constructed on a bench..."

"...disturbed soil areas shall be either hydroseeded or broadcast seeded...and fill slopes shall be mulched...between September 15th and October 15th."

"Drainage facilities shall be located on natural terrain and away from fill slopes...Drainage outlets shall be located to allow water to discharge into some form of vegetative cover, rocks or less erodible material."

Otherwise, all mitigation measures were included in the resolution of adoption.

Were mitigation measures carried out? If not, will they be carried out in the future? Cite sources for this information.
No construction has yet occurred but the recorded map indicates the protected wetland area.

What county departments or other agencies were responsible for implementation?
County Planning, Public Works, Building, Health, Fire District, Sanitary District and Public Utilities District. Department of Fish and Game.

SUMMARY
This project is a representative example of current processing in Trinity County. Specific consideration was given to anadromous fish and their habitats.

REVIEWERS NAME AND DATE OF SURVEY: Richard Harris, August 7, 1998

DEVELOPMENT PROJECT REVIEW SURVEY FORM - CASE STUDY 4

PROJECT DATA
Name: Kramer Properties Subdivision

Location (attach map): Eureka area, Humboldt County

Dates of development review: Field review June, 1998, Office review July, 1998

Type of project: Residential subdivision

General project description (include major activities and phasing, if relevant):
Creation of 26 parcels on an 8.8 acre site located above wetland-slough. Grading of lots and access. Extension of public utilities. Lots to be sold and developed individually.

Was the project completed? When?
Road and some lot grading completed as of field review (June, 1998). No housing construction has commenced.

Is the project located in or near a stream which supports or could support anadromous fishes? What is the name of the stream?
Yes. A tributary to Martin Slough (Elk River watershed) traverses the property. Department of Fish and Game did not predict any impacts to anadromous fish or their habitats.

List the chronology of development processing:

Date submitted to county: First submitted in 1991. Initially approved in 1994. Changes to the tentative map were proposed and approved in 1997.

Date of acceptance by county: Unknown.

Environmental Impact Report required? No.

Negative Declaration filed? Yes, for initial project and for modified project.

Dates of public hearings (if any): 1993, 1997

Date of approval: 1997

Date of project completion: still under construction.

Relevant county policy documents applied or published:

Relevant General Plan Elements and policies: staff report indicates that the project is consistent with the Eureka Community Plan. With regard to hazards, "the project site is located in an area of low fire danger and outside any flood hazard zone....in an area of low instability." Resource Protection maps indicate that "sensitive habitat areas exist on or in proximity to the project site. These areas consist of the riparian corridor crossing the northern third of the property." Project is subject to the Greenway/Gulch Policies of the Eureka Community Plan.

Zoning ordinance: the modified subdivision conforms to all requirements of the County's zoning regulations. It is in a Residential Single Family zoning district with a Greenway and Open Space Combining Zone designation (applicable to riparian corridor).

Subdivision ordinance: the project conforms to all requirements and standards of the County's subdivision regulations.

Environmental Impact Report: N/A
Others (describe): Mitigated Negative Declaration

COUNTY PROCEDURES
Were any of the following impacts predicted to occur as a result of the project? Cite source for predicted impacts (e.g., environmental documents, report of planning staff, planning commission or board of supervisors findings).

Streamflow quantity modifications: Increased runoff due to impervious surfaces (source: Environmental Review Checklist)

Riparian clearing: No (source: Environmental Review Checklist; correspondence with Department of Fish and Game)

Erosion and sedimentation: Yes, due to site grading and placement of fill in streamside zone (source: Environmental Review Checklist; correspondence with Department of Fish and Game; staff reports)

Instream habitat modification (physical): No (source: Environmental Review Checklist)

Water quality impairment (thermal, biological or chemical): No (source: Environmental Review Checklist)

Migration barriers: No (source: Environmental Review Checklist)

What mitigation measures were proposed to offset impacts? Cite the authorities for the mitigation measures. (Attach additional sheets as necessary):
Original approval conditions in 1993 included provisions for delineating "the extent of riparian areas and streamside management areas" on the Development Plan. In these areas, "...certain development activities are constrained" in accordance with the Eureka Community Plan Greenway/Gulch Policy. This condition was imposed despite the protest of the property owner whose agent asked for a waiver of the policy. Subsequent to approval, grading occurred and the County determined that it deviated substantially from the approved grading plan and that a modification to the approved subdivision was required. The revised project included proposals for encroachment by filling in a portion of the streamside management area.

Additional mitigation measures imposed on the modified subdivision included several additions to the original conditions on approval. Substantive measures included requirements for riparian planting and monitoring of planting success, and delineation and perpetual maintenance of wetland restoration and enhancement areas. An erosion control plan was required and implemented prior to map recordation..

What (if any) permits were required by other agencies? What mitigation measures were recommended to offset predicted impacts? (Attach additional sheets as necessary)
The Department of Fish and Game had no permit-granting authority. It was consulted and provided the following conditions that were adopted by the County:

Cut and fill activities are conducted in accordance with the approved grading plan.
Erosion control is conducted in accordance with the approved plan.
Monitoring is conducted over a five-year period to assure successful establishment of the (riparian) plantings.
Constructive noticing of the mitigative purpose of plantings...and provisions for perpetual maintenance...to prevent possible future encroachments and degradation.

IMPLEMENTATION
Which mitigation measures adopted as conditions to project approval?
All the above measures were adopted.

Which mitigation measures were not adopted? None were proposed that were not adopted.

Were mitigation measures carried out? If not, will they be carried out in the future? Cite sources for this information.
Field visits in June, 1998 indicated that erosion control measures were carried out. No observations were made in proposed riparian planting areas.

What county departments or other agencies were responsible for implementation?
County Planning, Building and Public Works departments.

SUMMARY
This project represents a typical residential subdivision in an upland area. The primary concerns for the County and the Department of Fish and Game were prevention of erosion and sedimentation during the construction phase. These were adequately addressed. Long term cumulative impacts on riparian habitat were raised as an issue by the Department of Fish and Game and were a basis for additional mitigations. Impacts on anadromous fish or their habitats were not addressed (not raised as an issue) presumably because they were not considered significant.

REVIEWERS NAME AND DATE OF SURVEY: Richard Harris, July 24, 1998

DEVELOPMENT PROJECT REVIEW SURVEY FORM - CASE STUDY 5

INTRODUCTION
This form is to guide the evaluation of development project review procedures in the five counties. The goal of the evaluation is to determine if project reviews encompassed and mitigated the effects of projects on anadromous fishes and their habitats.

PROJECT DATA
Name: California Conservation Corps camp

Location (attach map): Happy Camp, Siskiyou County

Dates of development review: Office review July, 1998

Type of project: Use Permit

General project description (include major activities and phasing, if relevant):
Project consists of a Use Permit to allow for a California Conservation Corps camp including dormitory, classrooms, administrative offices, and parcourse loop. The camp would occupy about 4 acres of the 28.7 acre site. There are existing improvements on the site. Upgrading of utilities would be required.

Was the project completed? When? Unknown.

Is the project located in or near a stream which supports or could support anadromous fishes? What is the name of the stream?
Yes. The site is in the 100 year floodplain of the Klamath River.

List the chronology of development processing:

Date submitted to county: May 27, 1997
Date of acceptance by county: June 16, 1997
Environmental Impact Report required? No.
Negative Declaration filed? Yes.
Dates of public hearings (if any): November, 1997
Date of approval: November, 1997
Date of project completion: Unknown.

Relevant county policy documents applied or published:

Relevant General Plan Elements and policies: The project conforms to the General Plan but is subject to policies related to flood hazard (source: staff report)

Zoning ordinance: The site is zoned "O", open space and has an existing use permit for a snack bar (source: staff report). Public uses are allowed with a Use Permit.

Subdivision ordinance: N/A.

Environmental Impact Report: N/A.

Others (describe): County Flood Damage Protection Ordinance.

COUNTY PROCEDURES
Were any of the following impacts predicted to occur as a result of the project? Cite source for predicted impacts (e.g., environmental documents, report of planning staff, planning commission or board of supervisors findings).

Streamflow quantity modifications: Increased surface runoff predicted. Site is within 100-year floodplain of Klamath River (source: Initial Study)

Riparian clearing: None (source: Initial Study)

Erosion and sedimentation: None (source: Initial Study)

Instream habitat modification (physical): None (source: Initial Study)

Water quality impairment (thermal, biological or chemical): None (source: Initial Study)

Migration barriers: None (source: Initial Study)

What mitigation measures were proposed to offset impacts? Cite the authorities for the mitigation measures. (Attach additional sheets as necessary):
No mitigation measures were considered necessary for this project (source: Initial Study and Negative Declaration). The finished floors of constructed buildings must be above the anticipated 100-year flood elevation. Findings in the staff report were:

"1. On the basis of the Initial Study and comments received, the proposed project could not have a significant effect on the environment.

2. The record, as a whole, demonstrates that there is no evidence that the proposed project will have an individually or cumulatively significant adverse effect on wildlife resources or the habitat upon which wildlife depends, as defined in Section 711.2 of the Fish and Game Code."

A substantial number of conditions on the use permit were recommended by staff and adopted as conditions on approval. None of these were related to fish or their habitat.

What (if any) permits were required by other agencies? What mitigation measures were recommended to offset predicted impacts? (Attach additional sheets as necessary)
No comments were received from state or federal fish and wildlife agencies. No additional mitigation measures were proposed (source: staff reports and public hearing records)

IMPLEMENTATION
Which mitigation measures adopted as conditions to project approval?
All conditions recommended by staff were adopted as conditions on project approval (source: Land Use Permit).

Which mitigation measures were not adopted? None.

Were mitigation measures carried out? If not, will they be carried out in the future? Cite sources for this information.
Unknown.

What county departments or other agencies were responsible for implementation?
Planning and Public Works. Happy Camp Community Services District.

SUMMARY
This relatively minor project is typical of Siskiyou County. Land development pressures are low. Redevelopment of existing sites within areas where services are available occasionally occurs. In this project, no effects on fish or their habitats were predicted even though the site lies within the floodplain of the Klamath River. The only issue raised was floodproofing of proposed structures. No consideration was given to possible cumulative effects on the Klamath River.

REVIEWERS NAME AND DATE OF SURVEY: Richard Harris, July 29, 1998
DEVELOPMENT PROJECT REVIEW SURVEY FORM - CASE STUDY 6

PROJECT DATA
Name: Goodyear Tree Farm

Location (attach map): Readings Creek Road, Trinity County

Dates of development review: Field review April, 1998, Office review August, 1998

Type of project: Residential subdivision

General project description (include major activities and phasing, if relevant):
Project consists of the rezoning and subdivision of a 363 acre parcel into 11 lots. It would create nine lots for residential uses and two residual lots zoned for timber production.

Was the project completed? When? No.

Is the project located in or near a stream which supports or could support anadromous fishes? What is the name of the stream?
Yes, the project site is located at the confluence of Readings Creek and the Trinity River.

List the chronology of development processing:

Date submitted to county: early 1996
Date of acceptance by county: December, 1996
Environmental Impact Report required? No.
Negative Declaration filed? Yes.
Dates of public hearings (if any: May, 1997 and March, 1998
Date of approval: March, 1998
Date of project completion: N/A

Relevant county policy documents applied or published:

Relevant General Plan Elements and policies: General plan designates the site for Resource/Rural Residential uses. The majority of the property is timberlands/open space. The Douglas City Community Plan designates the project site for residential development.

Zoning ordinance: Present zoning is Rural Residential (RR-2.5), 2.5. acre minimum lot size and Timber Production Zone (TPZ). The proposal would rezone a portion of the property from TPZ to either Agriculture-Forest (AF-20) 20 acre minimum lot size, or RR-2.5.

Subdivision ordinance: The project staff report contains an analysis of public access to the Trinity River as required by the State Map Act. It concludes that a requirement for public access should be waived. Otherwise, the project appears to be consistent with the county's subdivision ordinance.

Environmental Impact Report: None required.

Others (describe): The site is within the Wild and Scenic River Corridor of the Trinity River with a Recreation designation. Under state law, the Department of Fish and Game must make a determination that the project will not adversely affect the river's status.

COUNTY PROCEDURES
Were any of the following impacts predicted to occur as a result of the project? Cite source for predicted impacts (e.g., environmental documents, report of planning staff, planning commission or board of supervisors findings).

Streamflow quantity modifications: "...development...introduces the possibility of elevated discharge to...Reading's Creek...six parcels will be created along Reading's Creek and the Trinity River." (source: Initial Study)

"The proposed project will affect stream flows in the Trinity River by establishing three new riparian water rights...This impact is considered non-significant." (source: Biological Evaluation)

"Increased water withdrawals from Reading's Creek could impact salmonid habitat by decreasing flows, altering habitat types and raising temperatures...These impacts are documented as...potentially significant..." (source: Biological Evaluation)

"...to ensure that wells will supply domestic water...no new riparian rights will be assigned as a result of this map." (source: Initial Study)

"...wells will intercept shallow groundwater...(and) will have an insignificant affect on stream flows or fisheries habitat...If the shallow wells cannot produce necessary flows the applicant will have to drill deep wells." (source: biological Evaluation)

Riparian clearing: "Development of lots may affect, but not likely adversely affect, riparian habitat or stream cover." (source: Biological Evaluation)

Erosion and sedimentation: The Initial Study notes several areas of slope instability or severe erosion hazard on the property.

"Potential increases in sediment are minimized by both standard subdivision improvement standards and in project specific mitigation." (source: Biological Evaluation)

Instream habitat modification (physical): "Probably the most important element in anadromous fish habitat is the presence of large woody debris." (source: Initial Study)

"This project will not result in changes to in-stream habitat." (source: Biological Evaluation)

Water quality impairment (thermal, biological or chemical): "Access roads, building pads and other site-disturbing activities...can adversely impact the chemical composition, temperature and turbidity of nearby streams." (source: Initial Study)

See above discussion related to streamflow diversion effects on temperature.

Migration barriers: "This project will not...require any crossing of the river or stream that will create migration barriers." (source: Biological Evaluation)

What mitigation measures were proposed to offset impacts? Cite the authorities for the mitigation measures. (Attach additional sheets as necessary):
Source for all is the Initial Study:

2. A drainage, grading and erosion control plan should be submitted...

3. The 100 year floodplain of Reading's Creek and the Trinity River should be designated...on the final map.

4. The Scenic Conservation Overlay should be placed on the floodplain of Reading's Creek which prohibits disturbance of the riparian vegetation and other activities without first obtaining a Planning Director's Use Permit....

5. The entire project area should comply with the waste discharge prohibitions in the Water Quality Control Plan for the North Coast Region...

19. Access along the river is required and shall be provided, as determined in the county Subdivision Ordinance.

20. ...No new riparian water rights should be assigned to newly created parcels.

What (if any) permits were required by other agencies? What mitigation measures were recommended to offset predicted impacts? (Attach additional sheets as necessary)
No other permits required.

IMPLEMENTATION

Which mitigation measures adopted as conditions to project approval?
Board of Supervisors Resolution approving the subdivision included measures 2 and 3. No other measure was adopted as written above but additional ones were included as follows:

"A determination from the National Marine Fisheries Service that the project as mitigated is not likely to adversely affect Coho salmon or their habitat ...or that an incidental take permit has been issued..."

The scenic overly zoning was implented as a separate act. In addition, two alternatives for providing water supply are presented in the resolution which involve tradeoffs and required documentation for use of wells or riparian rights. The National Marine Fisheries Service did not object to the project.

Which mitigation measures were not adopted?
In the resolution, there is no mention of Initial Study measure 4. It is unclear if restrictions on riparian rights will be enforced.

Were mitigation measures carried out? If not, will they be carried out in the future? Cite sources for this information.
Unknown.

What county departments or other agencies were responsible for implementation?
County Planning and Public Works, Department of Fish and Game, North Coast Regional Water Quality Control Board, National Marine Fisheries Service (?)

SUMMARY
This is residential development in the floodplain of an anadromous fish stream but no mention was made of potential impacts on floodplain function. The mitigation measures for reducing impacts on streamflow may or may not be effective, depending on implementation. There was no quantitative evidence presented to indicate that wells (shallow or deep) would not affect streamflow. There are contradictions in mitigation measures. The adoption of the Scenic Overlay to protect the riparian zone appears to have not been implemented.

REVIEWERS NAME AND DATE OF SURVEY - Richard Harris, August 11, 1998

DEVELOPMENT PROJECT REVIEW SURVEY FORM - CASE STUDY 7

PROJECT DATA

Name: Borcich and Wheeler minor subdivision

Location (attach map): Pearl Ranch Road, 3 miles south of Fort Bragg, Mendocino County (in the coastal zone)

Dates of development review: Field review - none, Office review - August, 1998

Type of project: Minor residential subdivision and modification of coastal development permit.

General project description (include major activities and phasing, if relevant):
Project consists of the subdivision of a 8.2 acre parcel into 4 lots of 2+ acres. This minor subdivision is of one of four parcels created by a 1977 subdivision. The property is generally level with a slope of 2 to 5 percent to the south, then dropping more steeply (about 40 percent) down to Mitchell Creek on the southern property line.

Was the project completed? When? Unknown.

Is the project located in or near a stream which supports or could support anadromous fishes? What is the name of the stream?
Unknown, the project site is located on the edge of Mitchell Creek, but no mention is made of anadromous fish. The Mitchell Creek riparian corridor is treated as an Environmentally Sensitive Habitat Area (ESHA) which requires a riparian buffer.

List the chronology of development processing:

Date submitted to county: September, 1995
Date of acceptance by county: May 15, 1996 (Notice of Determination)
Environmental Impact Report required? No.
Negative Declaration filed? Yes.
Dates of public hearings (if any): May 2, 1996
Date of approval: May 2, 1995
Date of project completion: N/A

Relevant county policy documents applied or published:

Relevant General Plan Elements and policies: Coastal element policy 3.1-2 requires special review including on-site inspection in conjunction with Environmentally Sensitive Habitat Areas (ESHAs). Policy 3.1-7 calls for buffers of 100 feet adjacent to all ESHAs unless it can be demonstrated that 100 feet is not necessary. The buffer shall not be less than 50 feet.

Zoning ordinance: Present zoning is Rural Residential, RR:L-5-PD [RR:L-2-PD]: FP
"The coastal development use permit is required by the Planned Unit Development (:PD) Combining District which is intended to require a site plan for new development so that each new parcel will be reviewed to ensure maximum protection of sensitive coastal resources and preservation of open space. (Buffers are proposed to protect riparian vegetation.)"

The zoning of the subject property includes the "Planned Development" Combining District which is intended to insure maximum preservation of open space and coastal resources. The tentative map has been designed to provide building envelopes on all the parcels which would create a buffer zone along Mitchell creek and provide for open space. In staff's opinion, the proposed building envelopes would create clustering of development and allow for preservation of open space and coastal resources."

Subdivision ordinance: Unknown.
Environmental Impact Report: None required.
Others (describe):

COUNTY PROCEDURES

Were any of the following impacts predicted to occur as a result of the project? Cite source for predicted impacts (e.g., environmental documents, report of planning staff, planning commission or board of supervisors findings).

Streamflow quantity modifications: "The southern boundary of the subject property is Mitchell Creek and, according to the County adopted FEMA Flood Maps, a small portion of the property is within the 100 year floodplain. That portion of the property is in a buffer area not to be developed. Staff does not anticipate any significant environmental problems related to flooding." (Source: staff report)

A hydrological study was done in which test wells were dug. The well on one proposed parcel was considered marginal and "county standards will require that surface storage be provided. The report concludes that withdrawing groundwater for the project will not adversely affect groundwater supplies in the area or significantly impact the environment." (Source: staff report)

Riparian clearing: "A botanical survey prepared by Dr. Gordon McBride concludes...the riparian vegetation along Mitchell Creek is well developed and should be protected from disturbance. The report recommends that a 50-foot buffer zone be established. Staff has visited the site and concur... Staff believes that limiting future development to the building envelopes identified on the tentative map will provide a buffer in excess of that recommended by Dr. McBride."

Erosion and sedimentation: The steep slopes toward Mitchell Creek reserved from development. (source: staff report)

Instream habitat modification (physical): "This project will have a potential adverse impact on the land which supports fish and wildlife resources. (source: staff report)

Water quality impairment (thermal, biological or chemical): Water quality impacts, either on-site or off-site are identified as an issue. (source: Initial Study)

"Compliance with recommended minor subdivision conditions #1&2 will mitigate potential adverse impacts on water quality from the placement of additional septic systems on the property. "(source: staff report)

Migration barriers: None

What mitigation measures were proposed to offset impacts? Cite the authorities for the mitigation measures. (Attach additional sheets as necessary):
Three pages of conditions on the development and use permit are included in the staff report including:

Subdivision conditions:
1. Soil permeability testing to determine sewage disposal feasibility must be performed on parcels 1,2,3,4 according to the standards found in the Division of Environmental Health's "Subdivisions and Parcel Map Requirements" last revision. These results including a map showing the location of all tests must be submitted to and accepted by, the Division of Environmental Health.

2. Soil profiles must be performed on parcels 1,2,3, 4. Each profile must be to a minimum depth of 8 feet and include a description which is to be submitted to the Division of Environmental Health for review.

7 . "If a parcel map is filed, all natural drainage and water courses shall be shown as easements on the final parcel map. Minimum width shall be 20 feet, or to the high water level plus five (5) feet horizontal distance, whichever is greater. (all parcels 5 acres and less)."

Subdivision road standards require bringing the road up to county standards.

12. A note shall be placed on the Parcel Map which states: "Future development shall be confined to those areas defined as building envelopes on the tentative map on file with the department of planning and building services."

** No mention is made of the need for surface water storage in parcel 2, however, maybe this shows up in the building permit.

What (if any) permits were required by other agencies? What mitigation measures were recommended to offset predicted impacts? (Attach additional sheets as necessary)
A Coastal Development Permit was required. This required that the planning commission find that:

The proposed development will not have adverse environmental impacts
G. That in regard to developing less than 100 feet from the ESHA:
The resource as identified will not be significantly degraded by the proposed development.
There is no feasible less environmentally damaging alternative.
All feasible mitigation measures capable of reducing or eliminating project related impacts have been adopted.

Coastal land division findings:
B. The new lots created will not have, individually or cumulatively, a significant adverse effect on ESHA areas or other coastal resources.

IMPLEMENTATION
Which mitigation measures adopted as conditions to project approval?
The Planning commission's minutes approving the subdivision adopt all of the recommended conditions except:

Subdivision condition # 12 is deleted, and instead this condition is reworded and made a condition of the use permit:

1. "An additional information sheet shall be prepared and submitted for recordation with the parcel map which shall illustrate the locations of building envelopes for the parcels created by this minor subdivision consistent with the buffers recommended in the botanical survey dated September 2, 1992, prepared by Gordon McBride, PHD and consistent with the building envelopes approved for the permit. Further, the following notations shall be provided: "Development of the parcels created by this minor subdivision shall be limited to building envelopes identified hereon." (Planning commission meeting minutes)

Which mitigation measures were not adopted? See above.

Were mitigation measures carried out? If not, will they be carried out in the future? Cite sources for this information. Unknown.

What county departments or other agencies were responsible for implementation?
County Planning and Public Works, Department of Fish and Game, California Coastal Commission

SUMMARY
The required riparian buffer was imposed on the subdivision. The recommended width of 100 feet (in the general plan) was reduced to 50 feet after site visit. Although this may be due to site topography, the reasons for the reduction are not discussed in the report. "The commission discussed at length staff's recommendation for reduction of the setback from the county code required 100 feet to 50 feet without input from Fish and Game. Mr. Falleri discussed the referral process and the difficulty in obtaining written comments from Fish and Game." (Planning commission minutes)

REVIEWERS NAME AND DATE OF SURVEY: Susie Kocher, August 13, 1998

DEVELOPMENT PROJECT REVIEW SURVEY FORM - CASE STUDY 8

PROJECT DATA
Name: West Fork Subdivision, Robert and Laura Wood

Location (attach map): West of the Russian River and south of Lake Mendocino Drive, Ukiah

Dates of development review: Field review - June, 1998, Office review - August, 1998

Type of project: Major subdivision in floodplain

General project description (include major activities and phasing, if relevant):
The project consists of a major subdivision of 32.7 acres to create, in four phases, 125 single family residential lots ranging from 6,000 to 13,000 square feet, with a 17,500 square foot remainder parcel, a one acre open space park parcel, and a 4+ acre open space/riparian corridor. The parcel currently contains a single family dwelling, vineyard, and orchard.

Was the project completed? When?
Subdivision was approved but construction has not yet begun.

Is the project located in or near a stream which supports or could support anadromous fishes? What is the name of the stream?
Yes, Russian River

List the chronology of development processing:

Date submitted to county: 1994?
Date of acceptance by county: 1994?
Environmental Impact Report required? No.
Negative Declaration filed? Yes.
Dates of public hearings (if any): November, 1995 (Planning commission); January, 1996 (Board of Supervisors), August, 1997 (Planning Commission)
Date of approval: September, 1997
Date of project completion: N/A

Relevant county policy documents applied or published:

Relevant General Plan Elements and policies: The project was recommended for denial by the planning commission in 1995 due to inconsistencies with the general plan, specifically:

Water Resources Goal 4 - The county shall seek to reduce life and property damage while protecting the integrity of the floodplain

Water Excess Policy 4d - The county encourages compatible uses of the floodplain such as agriculture, forestry and recreation

It was also found inconsistent with surface faulting policy 2, inappropriate for the proposed density due to the distance from transit, and found to have unmitigated impacts on the school population and traffic.

The City of Ukiah's open space and conservation element policy OC-8.1 prohibits conversion of riverfront agricultural land to residential, general commercial, or industrial use. It's implementation measure says that no lands within the 100 year floodplain of the Russian river shall be converted from agricultural use to residential, general commercial, or industrial development. (source: staff report 11/95)

Zoning ordinance: Zone S-R, Suburban residential
The property was rezoned from agriculture with a 40 acre minimum to suburban residential in 1992. At the time of the review, staff recommended denial due to perceived conflicts with general plan policies relating to agricultural lands protection, floodplain management, and seismic safety. That rezoning was recommended for denial by the planning commission but approved by the Board of Supervisors in November 1992.

The rejection of the West Fork subdivision proposal by the planning commission in 1995 recommended that the portion of the property within the 100 year floodplain be reclassified (from SR) to a lower density land use that is compatible with the floodplain. Commissioner Ruffing recommended initiation of a general plan amendment and rezoning establishing zoning which is compatible with the floodplain.

Subdivision ordinance: A proposal to create 82 parcels on the adjacent property on the north side of Lake Mendocino Drive was denied by the Board in 1993 due to cumulative impacts particularly floodplain issues.

Environmental Impact Report: None required. "In staff's opinion, the two outstanding issues of significant environmental concern that were not fully mitigated are the issues of development in areas of known geologic and flood hazard and the related issue of cumulative impacts on the floodplain by converting the floodplain to incompatible land uses. The planning commission/BOS must determine if development is consistent with the general plan and good public policy. While some would argue that an EIR may be appropriate, staff does not believe that an EIR is warranted in that additional information is not needed for any project specific issue. Therefore staff believes that a Negative Declaration would be appropriate should the General plan and public policy issues be resolved." (source: staff report 11/95)

Others (describe): None.

COUNTY PROCEDURES
Were any of the following impacts predicted to occur as a result of the project? Cite source for predicted impacts (e.g., environmental documents, report of planning staff, planning commission or board of supervisors findings).

Streamflow quantity modifications: The report by Mr. Rick VanBruggen, hydrologist for the applicant from Water Resources Consulting services assessed the project's relationship with the bordering Russian River and its floodplain. The analysis used a computer modeling program (HEC-2) to assess changes in the floodplain resulting from project development and concluded that "there would be no significant increase" in the Base Flood Elevation in the project vicinity. "The results of the HEC-2 analysis indicate that there would be no significant hydraulic effect felt from the existence of the project downstream. The increase in base flood elevations above the bridge would be limited to 0.15 feet, and 0.05 feet 800 feet upstream." (source: Hydraulic Analysis West Fork Subdivision Ukiah, California)

Mr. Dennis Slota, Water Agency, expressed concern with the project. He discussed the hydrologist's study and recommended additional studies. "Since the runoff from the project is not included in the HEC-2 analysis, I must disagree that total hydraulic effects are summarized. In addition, the HEC-2 analysis assumes free flowing water conditions; this is seldom the case in any large magnitude storm event. The effect of debris piling up at bridges and in blocked culverts wreaks havoc with the idealized assumptions and conclusions based on simple HEC-2 analysis. A thorough analysis should include the cumulative effects on the Russian River of all foreseeable city and county development plans that impact the Russian River." (source: staff report 1994) He recommended that the HEC-6 model be used. "In summary, Mr. Slota recommended denial of the project due to concerns with filling and building within the floodplain, building near a fault, impacts to fisheries, possible inundation from dam failure, protection of riparian areas, inconsistencies with the county general plan and city of Ukiah general plan, impacts to schools and air quality impacts." (Planning commission minutes 11/2/95)

The application was accompanied by a Preliminary Storm Water Pollution Prevention Plan prepared by Water Resources Consulting Services. The SWPP states that the unmitigated increase in runoff would be 50 percent from the project site and an 0.08 percent increase from the watershed. Mitigation alternatives referred to could include infiltration strips and basins, bio-filters, sedimentation and or attenuation basins and wet ponds. However, the author of the plan argues that the exact design of the drainage control facility be defined as part of the subdivision improvement plans. The County Water Agency (CWA) commented "there is not enough detail in the Supplied SWPPP to comment on the post-construction storm water management, but methods other than direct discharge into the Russian need to be developed."

Riparian clearing: The Department of Fish and Game commented "that in this reach of the river, the riparian plant community provides high quality wildlife habitat. The west branch also provides important aquatic habitat for steelhead, western pond turtle, amphibians, and other fish species. The subdivider proposes to create a buffer parcel that would separate the proposed lots from the river by a minimum of 100 feet. The application is silent as to whether rear yards will be fenced to limit or control access to the river. Staff will support a requirement that the residential lots adjoining the buffer area be fenced to reduce

impacts from direct access into the buffer area, while still providing access in the park area." (staff report 11/95)

Erosion and sedimentation: Approximately 25,000-30,000 cubic yards of fill will be imported, raising the existing surface level in some areas approximately 2 feet to raise the building pad elevations above the 100 year flood level. "Staff believes that elevating only the building pads and leaving the remaining portions of lots below the base flood elevation could create undesirable conditions from erosion or deposition of materials on those portions of lots subject to inundation." (Source: staff report 11/95)

Instream habitat modification (physical): Floodplain development - "Staff believes that the technical requirements of floodplain regulations can be met by elevating the building pads. However, staff would question if it is the intent of the flood protection provision of the FEMA guidelines to allow fill to create new parcels within the floodplain as opposed to allowing safe development of existing parcels." (source: staff report 11/95)

County water agency comment: "The proposed project destroys the floodplain rather than protecting its integrity. The existing use is compatible with the integrity and functioning of the floodplain. It is important to understand that the floodplain is integral to the functioning of a stream or river. Alteration of the floodplain will result in upstream and downstream impacts some of which are unpredictable or become apparent only in very high flow events such as 100 year or larger floods." (source: Staff report - 11/95)

"Mr. Dennis Slota, Water Agency, commented that ... the Russian River is listed as the 15th most endangered river in North America. He commented that this is an unstable reach of the river and placing residential development in this area will likely result in expensive bank maintenance. He pointed out that the government is spending billions of dollars relocating people out of the floodplain and it is inconsistent for Mendocino County to receive millions of dollars in flood relief and issue building permits to build in the floodplain." (Planning commission meeting 8/21/97)

Water quality impairment (thermal, biological or chemical): "Normal rain runoff emanating from residential development can introduce pesticides, fertilizers, oil, grease, heavy metals, battery acids, paints, solvents, gasoline, and other substances into the neighboring drainage systems, in this case the Russian River." (see SWPPP above)

Migration barriers: None noted.

What mitigation measures were proposed to offset impacts? Cite the authorities for the mitigation measures. (Attach additional sheets as necessary):
The 11/95 staff report suggests options for reducing the intensity of the project and number of lots. The staff report lists 5 pages of conditions if the project is approved. Pertinent ones include:

CC&R's shall be submitted for review and approval which shall include provisions for the following -

b. disclose the proximity of the floodplain and those areas subject to inundation during a 100 year flood.

Surface drainage facilities shall be designed and constructed. Subdivision improvements shall include design features as needed to adequately conduct runoff from completed phases across future phases to a satisfactory point of disposal.

c. ditch lining or other acceptable measures may be required to control erosion where ditch grade exceeds 5%.

Subdivision improvement plans shall include a perimeter surface drain or other design feature (to be constructed within appropriate easement) to capture surface water along the north boundary and conduct it to the subdivision storm drainage system.

Subdivision improvement plans shall include infiltration strips and basins, bio-filters, sedimentation and/or attenuation basins, and wet ponds or other facilities, to be installed within appropriate easement, sufficient

to mitigate any increase in runoff from the site. Drainage plans shall be subject to review and approval by the RWQCB. A general construction activity storm water permit shall be secured.

Prior to performing any work within the Russian River floodplain, the subdivider shall secure all applicable permits from the Department of Fish and Game, Army Corps of Engineers, and other agencies which may have control or authority.

Subdivision improvement plans shall include bank slope protection along the full length of the leading edge of the fill along the Russian River, in conformance to the recommendations contained in the fault study and preliminary geotechnical evaluation. The bank slope protection shall be completed as the fill is placed for each phase of development.

.. all areas within the subdivision subject to inundation in a 100 year flood shall be identified on the final map. ... Placement of fill shall be accomplished pursuant to a grading permit.

Depending on the will of the Planning Commission and Board, either condition could be applied to approval of the tentative map:

a. The entire ground elevation of all residential lots shall be one foot above the base flood elevation OR

b. Minimum elevations of building pads shall be one foot above the 100 year flood elevation. Building pads are defined as the area inside the building setback lines on each lot.

A permanent six foot fence shall be constructed prior to recording the final map for any phase which shall run along the north, south, and west boundary of Parcel C as depicted on the tentative map. Fence design shall be reviewed and approved by the DFG and Planning and Building services.

Prior to site development, a complete inventory of all major vegetation (e.g. trees or shrubs with a diameter of 12 inches or a circumference of 38 inches or more...) shall be submitted to Planning and Building Services. The subdivider shall develop final improvement plans which shall endeavor to preserve as much natural, existing vegetation as possible. Some minor changes to subdivision design shall be allowed to preserve existing vegetative features."

A note shall be provided on the final map that provides notification that the following building standards shall apply to the project development.

a. a grading plan and inspections will be required by the building department for all site work, including, but not limited to the sound wall, compaction, pad cuts or fills, rip rap placement and accessibility features in the common areas.

32. The 4+ acre buffer parcel, labeled as Parcel C on the tentative map shall be designated "open space/riparian corridor" on the final maps for any phase of the subdivision

What (if any) permits were required by other agencies? What mitigation measures were recommended to offset predicted impacts? (Attach additional sheets as necessary)
A Storm Water Pollution Prevention Plan was required (not sure from what agency). See streamflow quantity modification above. See condition number 6, 9, and 14 above.

IMPLEMENTATION
Which mitigation measures adopted as conditions to project approval?
Except for measure 5, all mitigation measures noted above were adopted. For mitigation 12, option b was chosen.

Which mitigation measures were not adopted?
See above.

Were mitigation measures carried out? If not, will they be carried out in the future? Cite sources for this information.
Unknown.

What county departments or other agencies were responsible for implementation?
County Planning and Building Services, Public Works, County Water agency, Department of Fish and Game gave comment as did the air quality district and other local agencies. (Implementation not yet completed).

SUMMARY
Staff recommended denial in first staff report, and denial was recommended by the planning commission 11/2/95 on a vote of 5-2. The Board of Supervisors denied the project on a vote of 3-2 "without prejudice" on 2/26/96 citing concerns with seismic safety and with creating dense residential development in an area of special flood hazard. The same project was resubmitted in April 1997 and the Planning commission again recommended denial on a vote of 4-2 in August 1997. The project was approved 9/22/97 by the Board of Supervisors. There was no change or redesign of the project between first and second submission. "The only notable change in circumstances since the previous application was heard is the political make up of the Planning Commission and Board of Supervisors which the applicants believe will result in a more favorable decision on the project." (Staff report update 8/21/97)

REVIEWERS NAME AND DATE OF SURVEY: Susie Kocher, August 17, 1998