Farm of the Future

Forest of the Future

Financing biodiversity, water quality, and climate change mitigation in the Big River and Salmon Creek Forests of California

The North Coast Conservation Program

The Conservation Fund

May 2011

FINANCING BIODIVERSITY, WATER QUALITY, AND CLIMATE CHANGE MITIGATION IN THE BIG RIVER AND SALMON CREEK FORESTS OF CALIFORNIA

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Case Series Editors: Ariela Summit, Louise E. Buck, Sara J. Scherr

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Introduction

The Redwood and Douglas fir forests of California's North Coast are among the most biologically rich and economically productive forests in the world. Endemic to a narrow coastal band running from Monterey Bay to the Oregon border, they harbor iconic species, such as the northern spotted owl and Coho salmon, and produce uniquely beautiful and durable finished lumber products. However, depleted inventories following decades of industrial timber management and the cost of increasingly complex regulations are forcing landowners to look at more profitable alternative land uses such as vineyards and rural ranches. Consequently, many forest landowners are seeking economic incentives that will enable them to maintain the forests intact, producing ecological and economic benefits into the future. The Conservation Fund's Big River and Salmon Creek Forests offer a powerful demonstration of programs that provide financial incentives to landowners that are willing to make long-term commitments to sustainable forest management practices, thereby achieving significant habitat conservation, water and air quality enhancements, and economic development objectives.

Agricultural, Ecological, and Regulatory Context

California's North Coast stretches from Monterey to the Oregon border (see Figure 1). Productive timberland accounts for nearly half of the region's seven million acres. In terms of total acreage, forestry is by far the most pervasive industry in the region, with 80 percent of the region's timberland privately owned. Despite significant declines in harvest volumes attributable to inventory depletion and complex regulation, the North Coast still accounts for a third of California's timber production and almost half of California's annual timber revenue, primarily because of the predominance of the redwood forest type, which yields uniquely valuable sawtimber (The Conservation Fund 2005).

The forest products industry remains extremely important to local economies in the North Coast, generating about 13 percent of personal income and 16 percent of jobs (Laaksonen-Craig, Goldman, and McKillop 2003). The regional economy and job market have historically relied on natural resource industries, particularly timber and fishing. Employment in these industries has declined steadily, and jobs are shifting from goods-producing to service-producing industries. In Mendocino County, where timber has historically been the economic engine, wine grapes replaced timber as the top income producer in 2002, marking the "end of an era" (Geniella 2003). The continuing conversion of timberland to vineyards and rural subdivisions threatens the future recovery of this historically productive forested landscape.

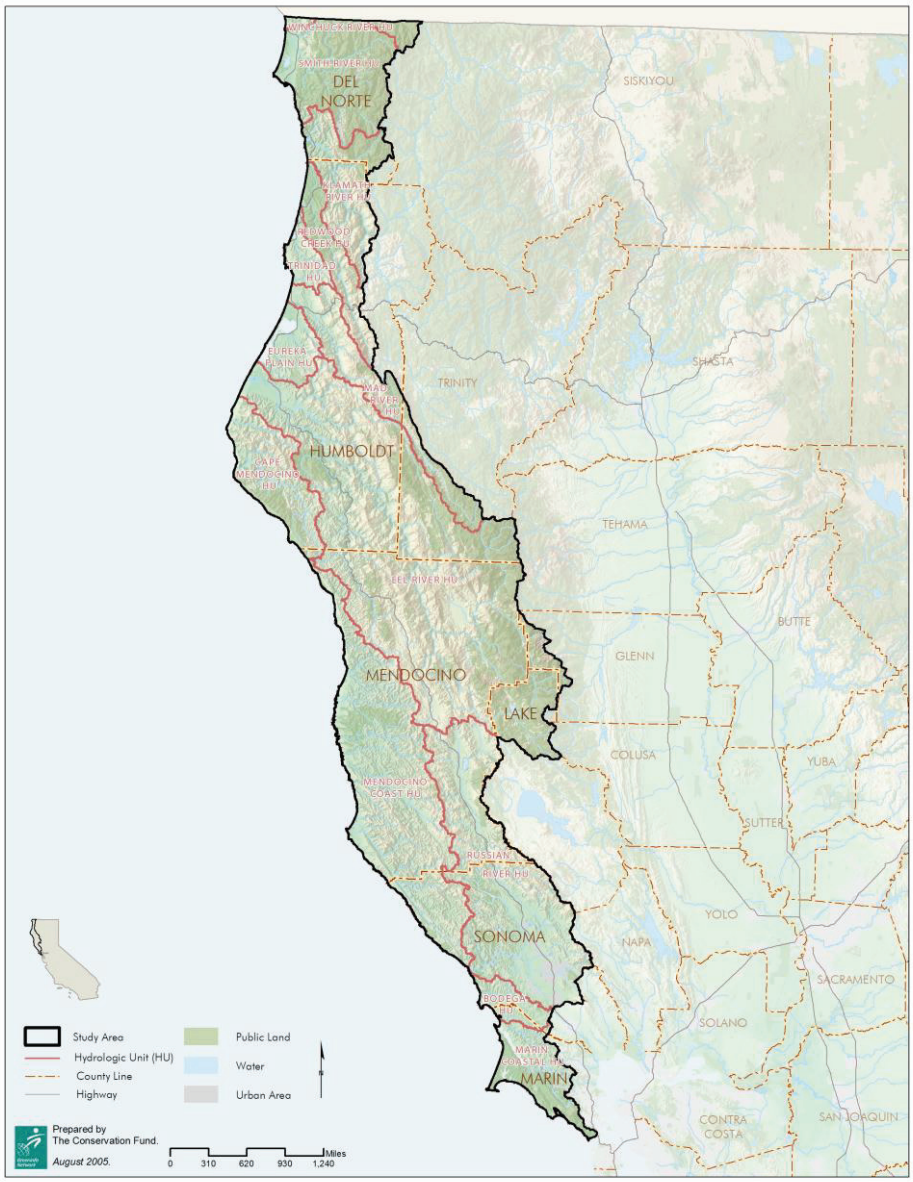
At the same time, California's North Coast is one of the richest and rarest ecoregions in the world. It is home to keystone species such as the northern spotted owl, marbled murrelet, mountain lion, salmon, and steelhead, as well as the iconic and endemic Redwood and Douglas fir forests. These temperate rainforests, which are predominantly within 40 miles of the coast, are largely defined by moist Pacific storms in the winter and coastal fogs in the summer. The World Wildlife Fund has designated Northern California Coastal Forests as a "globally outstanding ecoregion requiring immediate protection of remaining habitat and extensive restoration" and greatly increasing "the number of certified forests where timber is being harvested sustainably..." (The Conservation Fund 2005)

It is a fundamental tenet of conservation biology that the larger a protected area is, the more likely it can sustain functional ecological processes and biological diversity over time. Private forestland on the North Coast is concentrated in a few large ownerships. However, these ownerships are comprised of hundreds of smaller parcels that are increasingly subject to development pressures, such as rural subdivision and vineyard conversion that yield potentially greater financial returns in light of forest inventory depletion and regulation. As a result, there is a very real threat to the ecological integrity of these vast private forestlands and the aquatic and terrestrial species that inhabit them (The Conservation Fund 2005).

> *"[T]he potential loss of the wood products industry accentuates several major challenges. One challenge is retaining private forests in forest cover. Private forests provide significant public benefits in the form of various goods and services, including watershed protection, wildlife habitat and open space…. Thus it is in society's interest to retain the majority of these lands in forest cover… But with a decline of major markets for wood products, what incentives will these private owners have to retain or manage their lands as forest? Where timberlands are located in expanding metropolitan regions or in remote locations suitable for second homes, subdivision is a profitable possibility" (Laaksonen-Craig, Goldman, and McKillop 2003).*

The Big River and Salmon Creek Forests are strategically located to efficiently maintain the ecological integrity of the forested landscape. The 11,770-acre Big River property is adjacent to existing protected lands: Big River State Park, Mendocino Woodlands State Park, and the 50,000-acre Jackson Demonstration State Forest, which in turn provide links to Van Damme and Mendocino Headlands State Parks (The Conservation Fund 2005). Together these lands comprise the largest block of connected public land entirely within Mendocino County (CWPAP 2006). The 4,250-acre Salmon Creek property constitutes over 50 percent of the Salmon Creek watershed and is adjacent to a large, forested Mendocino Redwood Company ownership, facilitating coordinated

Figure 1. North Coast location map



Source: The Conservation Fund, 2005

management throughout the watershed. On average, the forests produce nearly three million board-feet of high quality Redwood and Douglas fir saw timber per year, contributing to the local economies of Fort Bragg, Ukiah, Mendocino, and other local communities.

Protecting and restoring the Forests and implementing management measures to reduce sediment achieve important state and federal water quality objectives. The federal Clean Water Act and the state Porter-Cologne Water Quality Act establish the broad framework for regulating water quality in California. Regulatory authority and oversight related to the effects of forest management on water quality is primarily provided by the North Coast Regional Water Quality Control Board under the auspices of the State Water Board. As required by the two acts, these boards identify "impaired water bodies" within the State that fail to meet specific water quality standards for point and non-point source pollution. The Big River Watershed has been identified as impaired due to sediments associated with historic forest and road management practices spanning many decades.

Certain forestry operations may degrade water that drains through forestlands in the absence of adequate controls. For example: (1) sediment concentrations can increase due to accelerated erosion, (2) water temperatures can increase due to removal of over-story riparian shade, (3) dissolved oxygen can be depleted due to accumulation of slash and other organic debris, and (4) concentrations of organic and inorganic chemicals can increase due to harvesting and fertilizers and pesticides (Blake, et al. 2000). The California Water Board's Non-point Source Implementation Plan identifies a variety of management measures to address nonpoint source pollution in California, several of which address forestry. It includes such measures as streamside management areas, road reconstruction, and management and timber harvesting methods, all of which The Conservation Fund is implementing in the Forests.

Protecting and restoring the Forests also furthers high priority strategies for recovery of salmonids on the North Coast. The California Department of Fish and Game's *Recovery Strategy for California Coho Salmon* identifies both the Big River and Albion River (which includes Salmon Creek) watersheds as "refugia" watersheds for Coho salmon (CDFG 2004). The two properties combined include 34 miles of Class I watercourse, 41 miles of Class II watercourse, associated riparian habitats, and four sub-basins[1] currently supporting Coho. The Coho Strategy recommendations include; 1) identifying and prioritizing specific sediment source locations for treatment that may deliver sediment to Coho salmon streams, 2) identifying and implementing actions to maintain or reduce

[1] CalWatershed 2.2a Planning Watersheds

water temperatures and, 3) implementing sustainable forest management practices in the range of Coho salmon to reduce the potential for development or conversion to non-forest uses.

Big River Profile

The Conservation Fund forges partnerships to conserve America's legacy of land and water resources. Through land acquisition, community and economic development, and training and education, the Fund and its partners demonstrate balanced conservation solutions that emphasize the integration of economic and environmental goals.

On California's North Coast, the Fund is implementing a new approach to forestland conservation that seeks to balance the need for environmental restoration and stewardship with the economic imperatives of ownership and the desire to sustain the local timber economy. Since 2004, the Fund has purchased 40,000 acres of North Coast forestland, including the Big River and Salmon Creek forests which are the subject of this case. Through these projects the Fund seeks to demonstrate that large, under-stocked tracts of coastal forest can be returned to ecological and economic viability through patient, adaptive management in partnership with private and public entities and community stakeholders.

Financing Ecosystem Services on the North Coast

Within the North Coast, the Big River and Salmon Creek Forests demonstrate how programs that provide financial incentives to landowners who are willing to make long-term commitments to sustainable forest management practices can achieve significant habitat conservation, water and air quality enhancement, and economic development.

Realizing significant financial value from the ecosystem services provided by large tracts of productive forestland requires identifying those services for which there is a sufficiently large and well-funded market. The ecosystem services associated with the Big River and Salmon Creek Forests are (1) permanent protection of open space and fish and wildlife habitat, (2) water quality protection and enhancement, and (3) climate change mitigation. The Conservation Fund was able to access payments for ecosystem services at levels sufficient to fund the purchase of the Forests and meet its debt service, management and other financial obligations while permanently protecting the Forests, enhancing water quality, and increasing carbon sequestration.

As described in more detail below, government grants helped The Conservation Fund purchase the forests, immediately and permanently preventing fragmentation of ownership. The low-interest loan has made it possible to reduce harvest levels, and the revenue from carbon sales has enabled restoration activities to accelerate. Financing for acquisition of the property is summarized in Table 1. The distribution of forest revenues for an average year is provided in Table 2.

Table 1. Financing acquisition

Funding Source	Amount
State Revolving Fund Loan	$25,000,000
State Government Grants	$14,500,000
The Conservation Fund Capital	$8,500,000
Total	$48,000,000

Over the last 30 years, the voters of the State of California have authorized the sale of bonds for the purchase of parks, open space, and wildlife habitat. Most recently, the voters passed Proposition 84 to "protect the rivers, lakes and streams of the state from pollution, loss of water quality, and destruction of fish and wildlife habitat," among other purposes[2]. The proceeds of the sale of these bonds are allocated to various state agencies that are charged with making direct purchases or grants to land trusts to fulfill the purpose of the bonds, typically through the purchase of fee or conservation easement interests in properties with high natural resource value.

In connection with the purchase of the forests, the Fund sought grants from two state agencies, the State Coastal Conservancy and the Wildlife Conservation Board. To be eligible for consideration for funding, The Conservation Fund needed to establish that the forests had exceptional natural

Table 2. Forest revenue sources (gross), average 2006-2009

Source	Revenue	Customer
Delivered Logs	48%	Local mills
Carbon Offsets	43%	Utilities, retailers and investors
Charitable Donations	7%	Foundations and individuals

[2] Appraised fair market value: $52,250,000

resource values and were a high priority for protection. This case was made through a Land Acquisition Evaluation requested by the Wildlife Conservation Board, in which The Conservation Fund referenced numerous state policies supporting watershed scale protection of working forest to protect and enhance wildlife habitat, particularly for endangered species such as Coho salmon and northern spotted owls.

Both the State Coastal Conservancy and the Wildlife Conservation Board ultimately concluded that the Forests were eligible for funding and each committed $7,250,000 to their purchase. These funds were delivered directly into escrow by the respective agencies on the scheduled closing date. At closing, The Conservation Fund delivered to the State Coastal Conservancy and the Wildlife Conservation Board recorded memoranda of grant agreements and other permanent restrictions prohibiting subdivision, development, clear cutting and conversion to non-forest uses, restrictions that are functionally equivalent to a conservation easement. As described above, conservation easements are authorized under state law to allow for the perpetual restriction of lands to stated purposes that confer public benefits, including environmental benefits such as watershed protection. The landowner conveying the restrictions typically is paid or takes a charitable gift deduction for the value of the rights restricted in the conservation easement. The State Coastal Conservancy and the Wildlife Conservation Board grants totaling $14,500,000 enabled The Conservation Fund to purchase the forests and ensure their permanent protection for the benefit of fish and wildlife habitat. These grants can be interpreted as a payment by the people of California for the ecosystem services inherent in protecting forestlands at the landscape scale.

Low-interest loans from the State Revolving Fund have been used previously in California for the preservation of large tracts of land in watersheds with impaired water quality. In 1999, The Nature Conservancy borrowed $8,000,000 to purchase the 13,000,000-acre Howard Ranch in southeast Sacramento County to prevent conversion to vineyards and to reduce water quality impacts from overgrazing. In that case, the loan was secured by The Nature Conservancy's balance sheet and repaid upon the sale of the Ranch back to a private owner subject to a conservation easement. This first use of the State Revolving Fund to conserve valuable watershed lands provided an important precedent for the loan made to acquire the Big River and Salmon Creek Forests.

In 2006, The State Water Board granted a $25,000,000, 20-year loan to The Fund from the State Revolving Fund (SRF) to help purchase the Forests and implement management measures identified in the State's Non-point Source Implementation Plan. The State Revolving Fund is a low interest loan program established under the federal Clean Water Act to fund a wide range of water quality projects. The loan was made at a 2.3 percent fixed rate of interest, resulting in annual loan payments

of $1,573,538 to the State Water Board. To qualify for the loan, The Conservation Fund was required to identify the water quality problem, propose the management measures to ameliorate the problem, and demonstrate the financial feasibility of achieving the project goals and repaying the loan. The final decision to fund the loan was made by the State Water Board at a regularly scheduled public hearing.

As The Conservation Fund proposed in its loan application, the principal source of repayment would be timber revenues from harvests on the forests. The Conservation Fund demonstrated that if harvested at commercial levels, the forests would generate approximately $3,758,725 per year in net timber revenues, based on 2006 values. The low interest rate allowed the Fund to significantly reduce harvest levels below industrial levels, and implement other high priority water quality enhancement measures identified by the Water Board.

If The Conservation Fund had borrowed $25,000,000 at a commercial interest rate of 7.5%, its annual payments would have been $2,416,776, a 54 percent increase over the State Revolving Fund annual payment. This would have required The Fund to either borrow less money or implement higher harvest levels, either of which would have rendered the project infeasible. By providing the low interest loan, the State Water Board was in effect making a payment for the ecosystem services (in this case, water quality protection and enhancement) attainable through the purchase of the Forests and the implementation of the desired management measures.

In 2000 California adopted Senate Bill 1771 and in 2001, Senate Bill 527, creating the California Climate Action Registry (CAR).[3] CAR's statutory purpose was to establish a voluntary platform for entities to register their emissions and to develop protocols for verifying emissions and emission reductions. In 2007 CAR adopted the Forest Project Protocol version 2.1 (FPP), which provides detailed specifications for establishing and verifying carbon sequestration on California forestlands resulting from forest management practices that exceed "business as usual." Under the FPP, only carbon stock increases already accrued in prior calendar years can be verified (called "ex poste" verification). Once those are verified by a third-party verifier, CAR issues to the project developer a Climate Reserve Tonne (CRT) for each verified metric ton of sequestered carbon dioxide. Each CRT is given a unique serial number that indicates the project type, location, owner, and the date of

[3] The California Climate Action Registry is now an independently funded non-profit organization. It has changed its name to the Climate Action Reserve and delegated the voluntary emissions reporting function to the newly created Climate Action Registry. See www.climateactionreserve.org.

issuance of the individual CRT. The CRTs are issued through a transparent online platform that allows project developers to sell and transfer their CRTs to buyers. The serial numbers ensure that the project developer cannot "double sell" their CRTs.

The creation of CAR and the development and adoption of the FPP enabled The Conservation Fund to register the forests in 2008, resulting in the issuance of more than 736,500 CRTs through 2009. [4] The market for CRTs was bolstered by California's 2006 adoption of Assembly Bill 32, also known as the Global Warming Solutions Act. AB 32 directs the California Air Resources Board

Table 3. Confirmed rare, threatened, or endangered animal species

Species	Listing Status*	BigRiver Detection	SalmonCreek Detection
Cooper's hawk (Accipiter cooperii)	DFG: CSC	X	
Northern spotted owl (Strix occidentalis ssp. caurina)	FT CDF: Sensitive	X	X
Osprey	DFG: CSC CDF: Sensitive	X	
Vaux's swift (Chaetura vauxi)	DFG: CSC	X	X
Northern red-legged frog (Rana aurora aurora)	DFG: CSC	X	X
Tailed frog (Ascaphus truei)	DFG: CSC		X
Southern seep/torrent salamander (Rhyacotriton variegates)	DFG: CSC		X
Western pond turtle (Clemmys marmorata ssp. marmorata)	DFG: CSC	X	
Steelhead (Oncorhynchus mykiss - Central California Coast Evolutionary Significant Unit)	FT	X	X
Coho salmon (Oncorhynchus kisutch – Central California Coast Evolutionary Significant Unit)	SE FE	X	X

*DFG: CSC = California Dept. of Fish & Game: California Species of Special Concern; CDF = California Dept. of Forestry; FT = Federal Threatened Species; SE = State Endangered Species; FE = Federal Endangered Species

(CARB) to develop and implement a program by 2012 to reduce California's greenhouse gas emissions to 1990 levels by 2020 "using maximum technologically feasible and cost-effective reductions in GHGs, including provisions for using both *market mechanisms* and alternative compliance mechanisms." Among the market mechanisms CARB is contemplating is a cap and trade program that would allow emitters to acquire offsets, such as CRTs, to meet their emission reduction targets.

The Conservation Fund has contracted to sell 1,094,578 of the CRTs expected to be produced by the Forests between 2007 through 2016, of which CAR has issued 736,517 CRTs to date. Buyers include Pacific Gas and Electric Company, the Disney Company, and UPS. The total value of the CRTs sold and contracted for sale is $7,020,000. These revenues have enabled The Conservation Fund to forego harvests during the soft 2009 log market and wait for stronger market conditions while still meeting its debt service and operating expenses.

Landscape-Scale Benefits for Forest Conservation

As described in detail above, the government grants of funds for acquisition helped purchase the Forests and prevent fragmentation of intact watersheds; the low-interest loan makes it possible to reduce harvest levels; and the revenue from carbon sales enables the acceleration of restoration activities, all of which restore terrestrial and aquatic habitat, enhance water quality, and reduce greenhouse gas emissions.

The Fund's management of the forests protects habitat for ten listed or sensitive wildlife species identified on the two tracts, and for many additional listed or sensitive wildlife species that are likely to be found there. Twenty-two northern spotted owl activity centers are located on the forests. The activity centers in the Salmon Creek Forest constitute over three-fourths of the watershed's total and occur within older second growth, approximately 90-120 years old. Between 1990 and 2005 at least 35 known spotted owl young fledged from the Salmon Creek activity centers. The crude density of spotted owls within the watershed in 2002 was 1.24 spotted owls per square mile, one of the highest compared to watersheds of a similar size in the area. Sites on both forests have been monitored yearly almost without exception since the early 1990s. Table 3 lists the confirmed rare, threatened, or endangered animal species on the two properties.

The forests include a significant representation of the vegetation types associated with the region. Approximately 80 percent of the forests are composed of Redwood and Douglas fir habitat. On the remaining hardwood-dominated sites, Redwood would take over if vegetation succession were allowed to proceed naturally. The Redwood habitat type has been shown to provide food, cover, or special habitat elements for 193 wildlife species including a variety of sensitive species.

In addition to the redwood and Douglas fir habitat type, riparian habitat, annual grass/forbs, Pygmy Cypress, and a small amount of Canyon Live Oak occur on the forests. Each provides water, thermal cover, migration corridors, and diverse nesting and feeding opportunities beneficial to many wildlife species.

Special habitat elements noted on the forests include snags, broken or dead-topped trees, trees with cavities, trees with loose bark, trees with large "wolfy" limbs, brush fields, dead and down material, hollow logs, dens, animal trails, ponds, and springs. The presence of special habitat elements across the landscape is crucial to many wildlife species.

The principal forest management practices implemented on the Forests provide ecological connectivity between important natural forest areas. The principles and associated benefits are as follows:

- Use primarily single-tree selection silviculture to produce forests with trees of all age and size classes. All harvests are designed to encourage natural regeneration and retain and develop critical wildlife habitat features, such as snags, downed wood, and trees of significant size.
- Generate revenue sufficient to repay the State Water Board loan and cover annual costs of operations and, to the extent feasible, reinvest in restoration and enhancement measures.
- Harvest at levels significantly less than growth over the next few decades to increase timber inventory and carbon storage, resulting in at least a 34 percent increase in standing inventory over the next two decades.
- Expand riparian buffers to improve habitat conditions and water quality protection by increasing canopy retention requirements for all classes of streams.
- Maintain certification under the Forest Stewardship Council and Sustainable Forestry Initiative standards and report carbon sequestration increases through the California Climate Action Reserve.

After major declines in salmonid habitat conditions over the last three decades, aquatic conditions seem to be slowly recovering from the past practices. Current regulatory protective measures through the California Forest Practice Rules and other regulations should prevent further degradation. But the acceleration of both aquatic and terrestrial restoration measures planned by The Fund is intended to improve the prospects for the recovery and maintenance of salmonids in the Big River and Salmon Creek Forests at a faster pace.

Improvement of spawning and migration habitat for salmonid species is a key management goal for The Fund and one of the principal motivations for the acquisition of the Forests. Prohibiting

development and agricultural uses on the Forests precludes the largest possible impacts on water quality, followed by comprehensive property-wide road assessments to identify and prioritize sites with sediment delivery potential.[5] In addition, The Fund has committed to management practices that, among other things, establish riparian buffers that are wider than required under the Forest Practice Rules. Finally, the predominant silviculture practice beyond the formal riparian buffers is single-tree selection, which substantially extends the effective riparian buffer width.

SCALING UP: CHALLENGES AND OPPORTUNITIES

The experience of the Big River and Salmon Creek Forests with payments for ecosystem services suggests that there are major opportunities to enhance conservation and sustainable timber production both in the North Coast forests of California and around the country. For example, the State Revolving Fund is a program funded in large part by the federal Clean Water Act. Many states have similar programs though not all have been expanded to include funding for non-point source pollution projects. Many states have dedicated funding for the purchase of conservation easements. Some foundations also provide funding for forest conservation projects. The Federal Forest Legacy Program administered by the U.S. Forest Service provides matching funds for forest conservation easements on a competitive basis, subject to federal appropriations. Federal law also provides for favorable tax treatment for qualifying donations of conservation easements.

At the same time, there are significant financial, technical and policy barriers to the broad availability of PES programs like those described in this case. For example, funding for the purchase of conservation easements always lags the demand. This barrier is exacerbated by the significant deficits in federal and state budgets.

Payments for management measures to enhance water quality may be one of the most promising sources for forest landowners. Funding comes largely from federal appropriations to the states for loans to implement water quality enhancement projects. Loan repayments accrue to the state-administered program to be re-loaned for other projects. However, many states do not currently authorize the kind of "expanded use" of the State Revolving Fund used in this case study.

Finally, The Climate Action Reserve Forest Project Protocol is now available for projects throughout the United States. There are also other verification standards, including the Voluntary Carbon Standard and the American Carbon Registry. Developing forest carbon projects, though,

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[5] The treatment of sediment would occur over the next ten to fifteen years at an estimated expense of over $5,000,000.

can be expensive and time consuming and can entail significant long-term commitments to manage the forest to ensure maintenance of the forest carbon stocks for which CRTs have been issued. Until there are state or federal regulations of carbon emissions that include using offsets as a way of meeting emission reduction obligations, there will be limited demand for CRTs. Without increased demand, CRT prices may be too low to justify the inherent expense and long-term commitments.

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GLOSSARY OF ECOSYSTEM CONCEPTS

BASIN - see "watershed"

BASIN PLAN - the Water Quality Control Plan for the North Coast Region

CALWATER - set of standardized watershed boundaries for California

CANOPY - overhead branches and leaves of streamside vegetation

CANOPY COVER - vegetation that projects over a stream

CLASS I STREAM - watercourse with fish always or seasonally present or where fish habitat is restorable

CLASS II STREAM - watercourse providing aquatic habitat for non-fish species

CLASS III STREAM - watercourse with no aquatic life present, but capable of sediment transport

CONIFER - softwood, cone-bearing tree species suitable for commercial timber production (e.g. redwood, Douglas-fir)

CONIFEROUS - any of various mostly needle-leaved or scale-leaved, chiefly evergreen, cone-bearing gymnospermous trees or shrubs such as pines, spruces, and firs

CONSERVATION EASEMENT - a legal agreement between a landowner and a qualified conservation organization that permanently restricts usage rights of the property, such as real estate development, commercial, and industrial uses

COVER - anything providing protection from predators or ameliorating adverse conditions of streamflow and/or seasonal changes in metabolic costs, such as instream cover, turbulence, and/or overhead cover, for the purpose of escape, feeding, hiding, or resting

DEBRIS - material scattered about or accumulated by either natural processes or human influences

DISSOLVED OXYGEN (DO) - concentration of oxygen dissolved in water, expressed in mg/l or as percent saturation, where saturation is the maximum amount of oxygen that can theoretically be dissolved in water at a given altitude and temperature

EROSION - the group of natural processes, including weathering, dissolution, abrasion, corrosion, and transportation, by which material is worn away from the earth's surface

HABITAT - the place where a population lives and its surroundings, both living and nonliving; includes the provision of life requirements such as food and shelter

HABITAT TYPE - a land or aquatic unit, consisting of an aggregation of habitats having equivalent structure, function, and responses to disturbance

HARDWOOD - non-conifer trees (e.g. tanoak, madrone, live oak, black and white oaks)

REFUGIA - a geographical region that has remained unaltered by a climatic change affecting surrounding regions and that therefore forms a haven for relict fauna and flora

REGENERATION - renewal of a tree crop, either by planting or natural seeding

RIPARIAN - pertaining to anything connected with or immediately adjacent to the banks of a stream or other body of water

SALMONID - fish of the family *Salmonidae*, including salmon, trout, chars, whitefish, ciscoes, and grayling

SECOND GROWTH TREES - established as seedlings after original old-growth logging (also called young-growth)

SEDIMENT - fragmented material that originates from weathering of rocks and decomposition of organic material that is transported by, suspended in, and eventually deposited by water or air, or is accumulated in beds by other natural phenomena

SILVICULTURE - the care and cultivation of forest trees; forestry

SLASH - branches and other residue left on a forest floor after the cutting of timber

SNAG - dead standing tree

SPAWNING - to produce or deposit eggs

SUSTAINABLE - development or resource use that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland 1987)

WATERSHED - total land area draining to any point in a stream, as measured on a map, aerial photograph or other horizontal plane (also called catchment area, watershed, and basin)

WATERSHEDS WITH THREATENED OR IMPAIRED VALUES - any planning watershed where populations of anadromous salmonids that are listed as threatened, endangered, or candidate under the State or Federal Endangered Species Acts with their implementing regulations, are currently present or can be restored

WORKING FOREST - forest managed for or including timber production

Glossary of Acronyms

CAR	California Climate Action Registry
CARB	(California) Air Resources Board
CDFG or DFG	California Department of Fish and Game
CRT	Carbon Reduction Ton
CSC	California Species of Special Concern
CWA	Clean Water Act
DFG	California Department of Fish & Game
ELZ	Equipment Limitation Zone
FE	Federal Endangered Species
FPS	Forest Projection and Planning System
FPP	Forest Project Protocol
FPR	(California) Forest Practice Rules
FT	Federal Threatened Species
GHG	Green House Gas
MOU	Memorandum of Understanding among The Conservation Fund, the State Water Board, the California State Coastal Conservancy and the Wildlife Conservation Board dated October 5, 2006
NCRWQCB	North Coast Regional Water Quality Control Board
NPS	Non-Point Source
NSO	northern spotted owl

PES	payment for ecosystem services
SCC	State Coastal Conservancy
SE	State Endangered Species
SFI	Sustainable Forestry Initiative
SRF	State Revolving Fund
SWRCB	State Water Resources Control Board
TCF	The Conservation Fund (also referred to as "the Fund")
TNC	The Nature Conservancy
USFWS	U.S. Fish and Wildlife Service
WCB	Wildlife Conservation Board
WDR	Waste Discharge Requirement (SWRCB)
WLPZ	Watercourse and Lake Protection Zone (Forest Practice Rules)