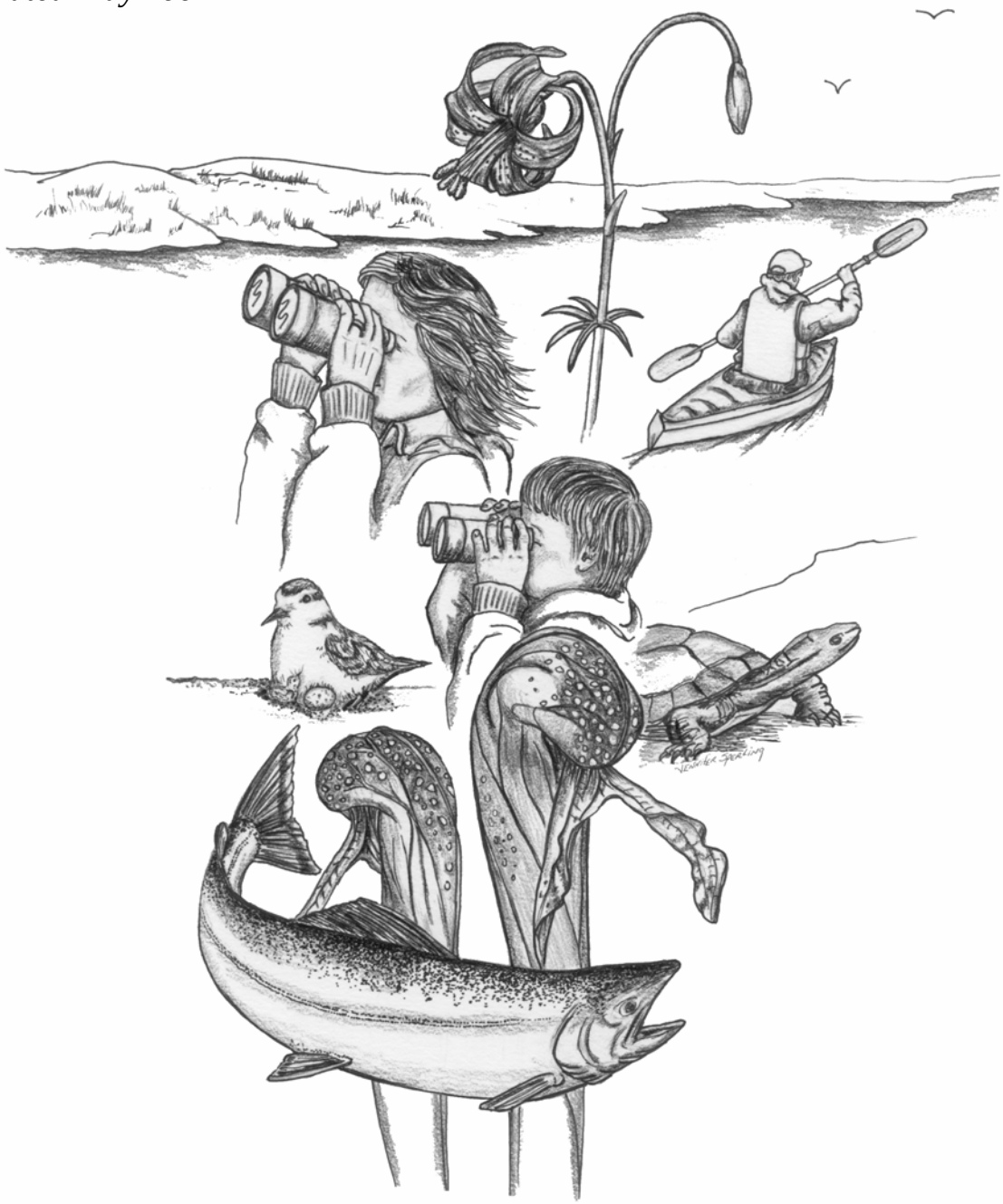
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Coos Bay District Office, 1300 Airport Lane, North Bend, OR 97459

NEW RIVER
AREA OF CRITICAL ENVIRONMENTAL CONCERN
MANAGEMENT PLAN

Updated May 2004



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MANAGEMENT PLAN

Updated May 2004

Myrtlewood Field Office
Coos Bay District
Bureau of Land Management
U.S. Department of the Interior

Approved By:

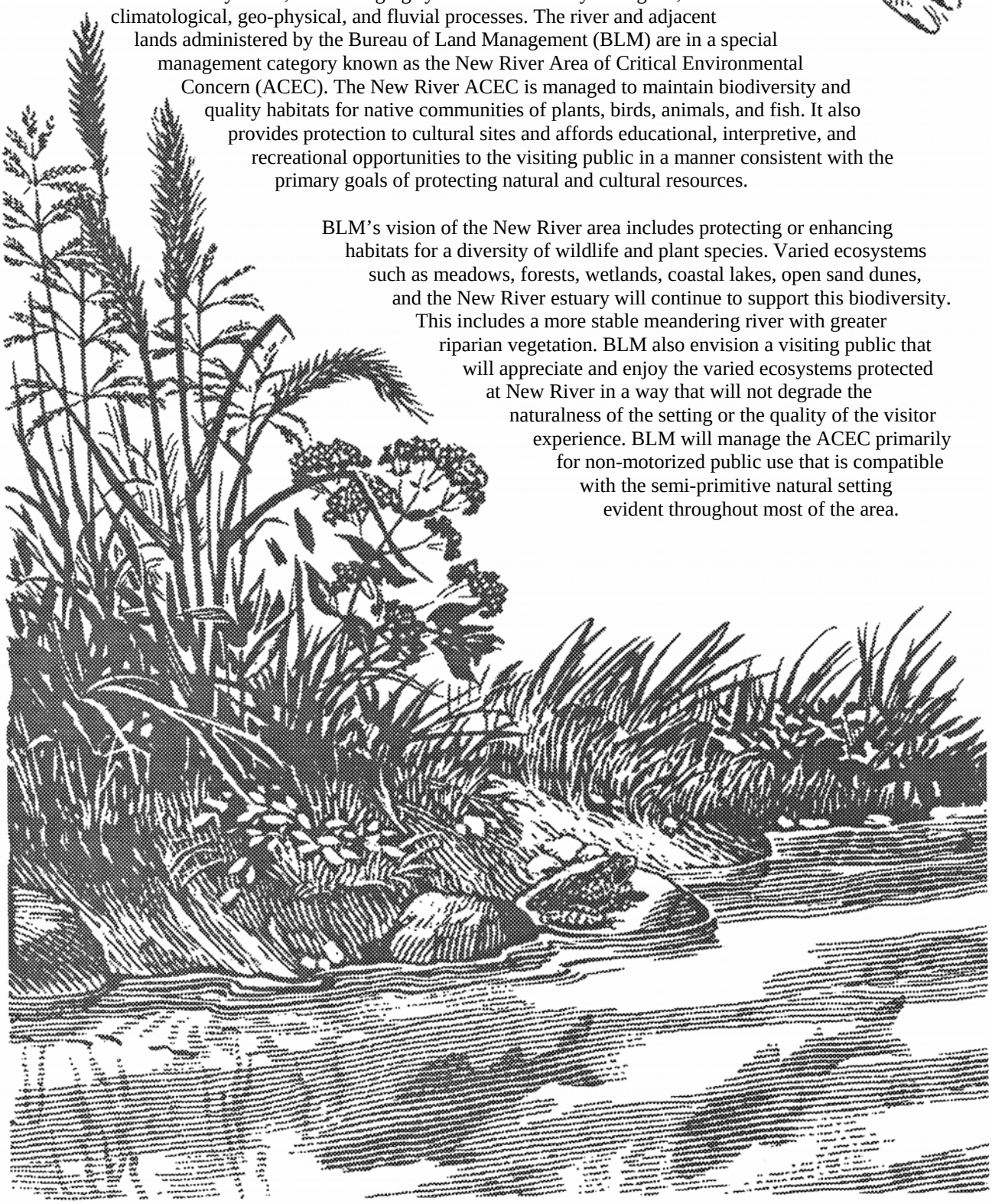
Richard Conrad
Myrtlewood Field Manager

5-25-04
Date

VISION STATEMENT

New River is a dynamic, ever-changing system influenced by biological, climatological, geo-physical, and fluvial processes. The river and adjacent lands administered by the Bureau of Land Management (BLM) are in a special management category known as the New River Area of Critical Environmental Concern (ACEC). The New River ACEC is managed to maintain biodiversity and quality habitats for native communities of plants, birds, animals, and fish. It also provides protection to cultural sites and affords educational, interpretive, and recreational opportunities to the visiting public in a manner consistent with the primary goals of protecting natural and cultural resources.

BLM's vision of the New River area includes protecting or enhancing habitats for a diversity of wildlife and plant species. Varied ecosystems such as meadows, forests, wetlands, coastal lakes, open sand dunes, and the New River estuary will continue to support this biodiversity. This includes a more stable meandering river with greater riparian vegetation. BLM also envision a visiting public that will appreciate and enjoy the varied ecosystems protected at New River in a way that will not degrade the naturalness of the setting or the quality of the visitor experience. BLM will manage the ACEC primarily for non-motorized public use that is compatible with the semi-primitive natural setting evident throughout most of the area.



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ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
ACS	Aquatic Conservation Strategy
APHIS	Animal and Plant Health Inspection Service
BLM	Bureau of Land Management
CFS	Cubic Feet per Second
CHU	Critical Habitat Unit
CMA	Cooperative Management Agreement
DLCD	Division of Land Conservation and Development
EA	Environmental Assessment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
HMM	Hazardous Materials Management
LAC	Limits of Acceptable Change
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service
NRCS	Natural Resource Conservation Service
ODA	Oregon Department of Agriculture
ODFW	Oregon Department of Fish and Wildlife
OHV	Off-highway vehicles
ONHP	Oregon Natural Heritage Program
ONHIC	Oregon Natural Heritage Information Center
OPRD	Oregon Parks and Recreation Department
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SPCC	Spill Control and Countermeasures Plan
SRMA	Special Recreation Management Area
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFWS	United States Fish and Wildlife Service
VRM	Visual Resource Management

EXECUTIVE SUMMARY

Introduction

New River has been described as one of the last remaining wild places along the Oregon Coast. With its diversity of habitats; interconnected network of rivers, streams, and lakes; and limited human use, New River is a secluded place rich in biodiversity – a place where plants and animals flourish and people are only visitors.

In 1983, BLM designated 686 acres of federal lands along New River as an Area of Critical Environmental Concern (ACEC) to protect this unique natural area. In 1987, BLM completed an initial management plan for the area. In 1989, a land acquisition plan was completed, and over the next eight years, BLM acquired an additional 670 acres of private lands from willing sellers, bringing the current total land base of the ACEC to 1,356 acres.

In 1989, the New River ACEC was identified as a Special Recreation Management Area (SRMA) (USDI BLM 1989), then later designated as such in the Coos Bay District Resource Management Plan (RMP) (USDI BLM 1995). SRMA is defined as an area where a commitment has been made to provide specific recreation activity and experience opportunities. These areas usually require a high level of investment and/or management.

In 1994, BLM completed the Final Coos Bay District Proposed RMP Environmental Impact Statement that described the primary resource values for the New River ACEC (USDI BLM 1994). These values included:

> "Special Status Species – River area and uplands contain important habitat for the American and Arctic Peregrine Falcon, Bald Eagle, Aleutian Canada Goose, and Western Snowy Plover – all federally listed species. Botanical species habitat supported in the New River area include silvery phacelia, western bog lily, pink sand-verbena – all federally proposed or candidate species.
>
> Plant Communities – Includes natural meadows, wetlands, sand dunes, and other habitat types supporting many unique plant species.
>
> Wildlife Habitat – Upland areas provide supporting habitat types and act as a buffer which supports the integrity of the river habitat areas.
>
> Historic/Cultural – Numerous, extensive prehistoric camps and villages border the river."

In 1995, BLM completed a comprehensive management plan for the New River ACEC. The plan's foremost theme is to conserve the values of the ACEC for the enjoyment of present and future generations. Equally important is BLM's commitment to adaptive management of the New River area. The backbone of the plan is its goals and objectives, which together establish the management direction and set forth specific resource values to be addressed:

Original Management Goals

Goal 1 – Manage habitat for biodiversity (i.e., a full range of native species, habitats, and ecological processes) and ecosystem health with special emphasis on sensitive wildlife and botanical species.

Goal 2 – Protect significant cultural resources from human disturbance or destruction.

Goal 3 – Manage for recreational activities to the extent compatible with Goals 1 and 2.

Goal 4 – Promote opportunities for education, interpretation, and nature appreciation to the extent compatible with Goals 1 and 2.

Original Management Objectives

Objective 1 – Maintain, enhance, or restore ecosystem health, and ensure management supports a variety of habitats at different successional levels, particularly, but not limited to, those which are necessary for special status species using the area.

Objective 2 – Establish suitable water flow and quality, and maintain areas in a condition supportive of a healthy aquatic ecosystem.

Objective 3 – Protect and interpret important cultural resources at New River.

Objective 4 – Accommodate low-impact recreational use at New River while providing a variety of experience opportunities to help meet existing and anticipated demands.

Objective 5 – Promote awareness and appreciation for New River's many resource values, especially those significant to its ACEC designation; also foster a "Leave No Trace" / "Minimum Impact" land use ethic and similar attitudes in visitors at New River.

Objective 6 – Provide adequate use supervision, visitor facilities, services, signing, and programs to protect resources and support planned visitor use activities and levels.

Objective 7 – Provide reasonable access to visitor use areas and the river with minimal impact on natural and cultural resources and visitor experiences.

Objective 8 – Facilitate improved management of the New River area through monitoring and research to learn more about the natural and cultural resources of the area.

Management Plan Update

In the fall of 2003, BLM determined that a plan update was needed to clarify the management direction of the ACEC, to report accomplishments and on-going management actions, and to provide up-to-date resource information. A BLM interdisciplinary team was then formed to complete the update. Since the plan update does not change the intent of the original management plan or propose any new actions that create impacts, a new environmental assessment is not required.

The plan update includes a rewording of goals 3 and 4 in order to better integrate the goals of providing recreation, environmental education, and interpretation opportunities with the primary goals of protecting natural and cultural resources of the New River area. The rewording of these goals better defines BLM's management direction of the ACEC, rather than simply state that these opportunities should be managed to the extent compatible with goals 1 and 2. The new wording of goals 3 and 4 is as follows:

Goal 3 – Manage for recreational activities that are compatible with protecting cultural resources and managing habitat for biodiversity and ecosystem health.

Goal 4 – Use environmental education and interpretation as a tool to manage visitor impacts and to broaden the appreciation and stewardship of the New River ACEC.

The plan update also includes a re-organization of the original plan's objectives to improve readability of the document. The update includes two new objectives that have been separated out of the original eight objectives. They include:

Objective 9 – Facilitate cooperative management of the New River area to better protect resource values through coordination and collaboration with others.

This objective was separated out from Objective 6: Site Administration and Development, due to the growing importance of working cooperatively to effectively manage the greater New River ecosystem. Collaborating with other agencies, county governments, non-profit organizations, institutions, local residents, and adjacent landowners has become critical to addressing the complex issues at New River.

Objective 10 – Develop an effective acquisition strategy in collaboration with willing landowners to improve overall protection and public benefit of the New River area.

This objective was separated out from Objective 1: Wildlife and Plant Resources. Since the greater New River ecosystem extends across a complex pattern of federal, state, county, and private ownership, a strategy is needed to insure protection of resource values located on lands outside the ACEC boundary. Although BLM has already acquired private lands available from willing sellers, a variety of other acquisition options still exist, especially conservation easements. With such a flexible approach, an effective strategy should be able to adapt to market changes, shifts in public attitudes, funding opportunities, and policy changes.

Another re-organization of the original objectives includes separating out project-specific monitoring actions from Objective 8: Monitoring and Research, and incorporating them in with their associated objective.

Other changes to the original management plan include the elimination of Part Four: Cost Estimates, since a majority of the projects described in this part of the plan have already been implemented (e.g., facilities and other infrastructure development). This part of the plan also proved to be of little use, due to its general approach to estimating costs of projects. As well, the yearly budget for the ACEC is driven primarily by available funding, and priority projects are carried out as funds are allocated.

Appendix B of the original management plan has also been eliminated. This appendix included people and organizations that provided comments or assisted in the initial planning effort for the ACEC. It also listed all individuals and organizations who received a draft copy of the original plan. For purposes of the plan update, this appendix is not necessary.

Vegetation and wildlife use area maps found in Part Two and Appendix D of the original management plan have been omitted. These maps have been replaced by more detailed maps that pertain to specific projects or management actions.

The Recreation section in Part Two has been expanded to incorporate an adequate discussion to meet the needs of an SRMA plan for New River. The rational for expanding this section is so that a separate SRMA plan is not necessary. This not only improves efficiency but ensures recreation management is

compatible with the goals and objectives of the New River ACEC. The SRMA designation acknowledges BLM's commitment to provide specific recreation activities and experience opportunities at New River in a manner that is compatible with protecting the natural and cultural resource values of the ACEC.

In order to better define the recreation setting of the New River ACEC, two new terms are used throughout this management plan update – roaded natural and semi-primitive non-motorized. These classifications will aid the BLM in the future management of the ACEC by establishing a set of conceptual controls for guiding visitor use. See the Recreation section in Part Two for details about these settings.

The plan update includes four new appendices that provide more detailed information about the natural systems of New River and BLM's management approach to the area:

Appendix B, Hydrology of New River, describes some of the results of BLM's monitoring efforts of the river system since the original plan was developed. These monitoring efforts were the basis for some of the management actions that have been implemented since completion of the original plan.

Appendix G, General Rules and Regulations, summarizes key rules that have been developed from various management actions described in Part Three, *The Management Program*. These have been created to better manage visitation in order to protect the unique natural, cultural, and recreation settings (i.e., roaded natural and semi-primitive non-motorized) of the area.

Appendix H, Monitoring and Evaluation Guidelines for Managing Recreational Use, has been developed to guide recreational use management at New River in order to avoid unacceptable impacts to the natural, cultural, and recreation settings of the area. This process is similar to the Limits of Acceptable Change (LAC) planning system developed by the U.S. Forest Service for wilderness areas (Stankey et al. 1985).

Appendix I, Glossary, has been developed to aid the reader in understanding scientific terms and uncommon words used throughout the plan.

Accomplishments

In designing the original plan (1995), a number of management actions were analyzed to determine how to best achieve the goals and objectives of the ACEC. Since then, a majority of these actions have been accomplished, including a wide-range of restoration, monitoring, and visitor-use related projects. The following highlights a few of the projects that have been implemented to date:

- BLM continues to implement a coastal dune restoration project on the foredune west of New River. Since 1998, over 200 acres of European beach grass have been removed to improve habitat for the Western Snowy Plover and a variety of rare, native plant species.

- BLM has collaborated with adjacent ranchers to develop cooperative management agreements that protect over four and a half miles of riparian and coastal dune habitat along New River and Floras Lake outlet from livestock use on both public and private lands.

- BLM is working with the adjacent ranchers and a variety of state and federal agencies to find more appropriate locations for breaching New River that improve estuarine habitat for coho salmon and other rare species while providing adequate flood alleviation on adjacent pastureland.

- BLM is coordinating with a number of institutions and agencies to protect and re-introduce rare native plants back into the New River ecosystem, including the western lily and pink sand-verbena.

- BLM is conducting a wide range of monitoring projects to better understand the natural environment of the area and how these systems are influenced by human interaction. A comprehensive monitoring and evaluation process is in place to ensure that the natural, cultural, and recreation settings of New River are protected for future generations.

- BLM is collaborating with Curry County on a cooperative management agreement for Floras Lake that improves protection of the Western Snowy Plover by seasonally restricting public access to higher quality nesting habitat located on county lands. In turn, the BLM-administered beach adjacent to Floras Lake is open for public recreation during the plover nesting season if no plovers are present in this area.

- The Ellen Warring Learning Center was constructed at the Storm Ranch portion of the ACEC. This facility is the focal point for interpretation and educational activities for the public. A kiosk and a number of outdoor interpretive displays have been placed throughout the ACEC to provide self-guided learning opportunities for visitors.

- Public access has been improved at the Storm Ranch, Floras Lake, Fourmile Creek, and Lost Lake portions of the ACEC. A variety of trails, foot bridges, boat launches, and a universally accessible wildlife viewing platform provide a range of low-impact recreational opportunities for visitors to enjoy the area.

Adaptive Management Approach

This plan update acknowledges the need to use an adaptive management approach to compliment the specific management actions contained in the plan. As described in the original New River ACEC Management Plan, adaptive management recognizes the need to manage resources under circumstances that contain varying degrees of uncertainty and the need to adjust to new information. It provides an avenue for responsive and quick management actions, if necessary. The concept works well if three elements are present:

- Clear goals, standards, and guidelines are in place;

- There is a willingness and a process to modify these same goals, standards, and guidelines if they are not working or in error; and

- Monitoring is used to help determine the condition of the management area.

Fundamentally, adaptive management is the application of the scientific principle of feedback and adjustment, of identifying and evaluating new information, and adjusting management to achieve the goals and objectives of a plan. In the case of New River, management approaches can be adjusted quickly to benefit the area as new information and knowledge become available. This plan update provides the framework for an adaptive management approach so long as the approach is within the scope of the original environmental assessment. New actions not covered under this original assessment would be evaluated under a separate decision document.

Adaptive management has been used in a number of instances at New River since the original management plan was completed. One example is the development of cooperative management agreements (CMAs) with Curry County and adjacent ranchers to resolve resource concerns that span across multiple land ownerships. These agreements have improved protection of special status species and unique wetland and riparian habitats of the area. See Objective 9, Cooperative Management Agreements, for details about each of these CMAs. Adaptive management can also be used to adjust these cooperative management agreements if monitoring indicates that changes have caused them to become ineffective.

Other examples of adaptive management at New River include: terminating the Old Bog Trail rather than loop it through a sensitive wetland area to connect with East Muddy Lake Trail; locating the Muddy Lake wildlife viewing platform in an area that has less potential for impacting migratory birds; and not implementing the native plant garden due to feasibility concerns. Examples also include temporarily breaching New River at key locations to improve aquatic and coastal dune habitats, and replacing the dilapidated foot bridge over Floras Lake outlet to maintain public access to the beach.

In addition, two other adaptive management actions are being implemented under this plan update. The first is the decision to allow primitive beach camping by special recreation permit at a designated site within the ACEC for long-distance backpackers hiking the Oregon Coast Trail (Objective 4, Types of Recreation Use). The rational for this is to resolve the problem of illegal camping in snowy plover nesting areas. Since most backpackers are unable to complete this section of the Oregon Coast Trail in one day, there is a tendency for them to camp within these plover nesting areas of the ACEC. The permit system will require campers to abide by special conditions designed to ensure the protection of ACEC values. Conversely, adaptive management can also be used to adjust or discontinue camping permits within the ACEC if monitoring shows extensive noncompliance has resulted in impacts to snowy plover breeding.

The adaptive management approach has also been used to adjust the design of the boat launch at Storm Ranch in a manner that is more conducive to the semi-primitive, non-motorized setting of the ACEC. Rather than have the road terminate at the water's edge, the new design limits vehicles from driving within the riparian area of New River. The new boat launch design provides easy foot access to the river for low-impact recreation activities, including: fishing, wildlife watching, sightseeing, and launching canoes, kayaks, and other non-motorized watercraft. BLM discourages access to New River with motorized boats except those powered by electric motors. This improves the naturalness of the area by restoring riparian habitat and minimizing disturbance to wildlife, which in turn enhances visitors' experience to New River.

Monitoring

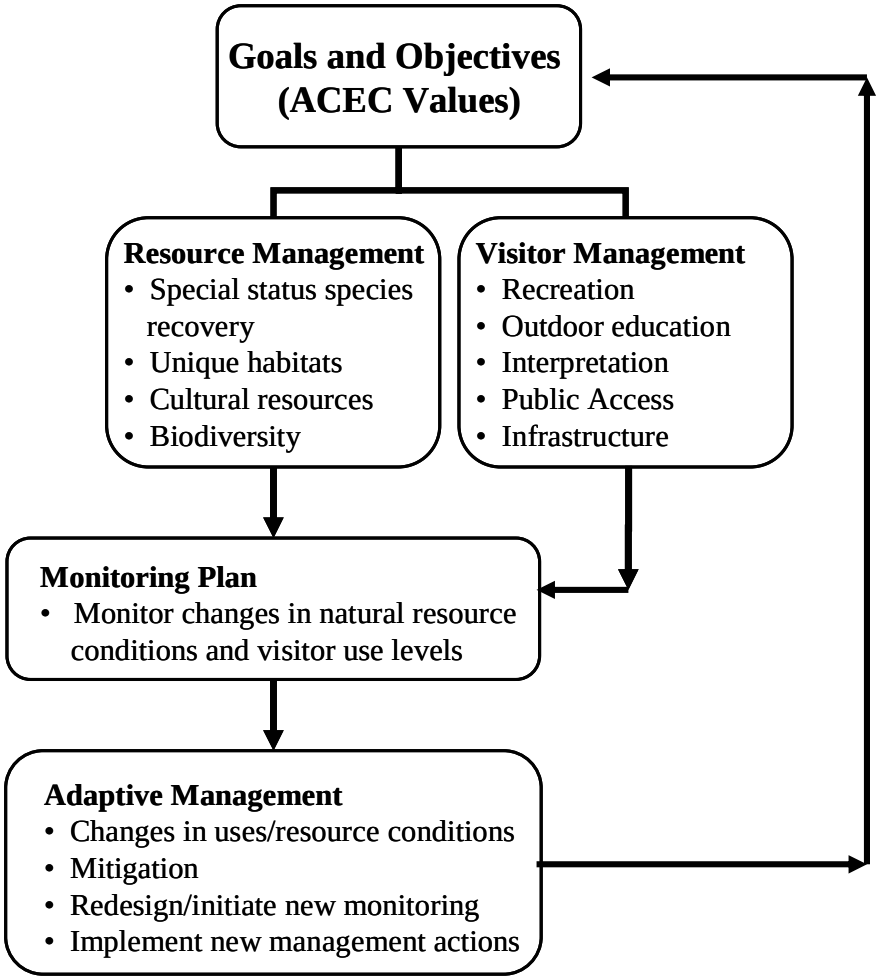
Monitoring is incorporated into the New River ACEC Management Plan at all levels. This monitoring is used to:

- Ensure that the management goals, objectives, and actions are being followed (implementation monitoring),
- Verify if the actions are achieving the desired results (effectiveness monitoring), and
- Determine if the underlying assumptions of the ACEC goals and objectives are sound (validation monitoring).

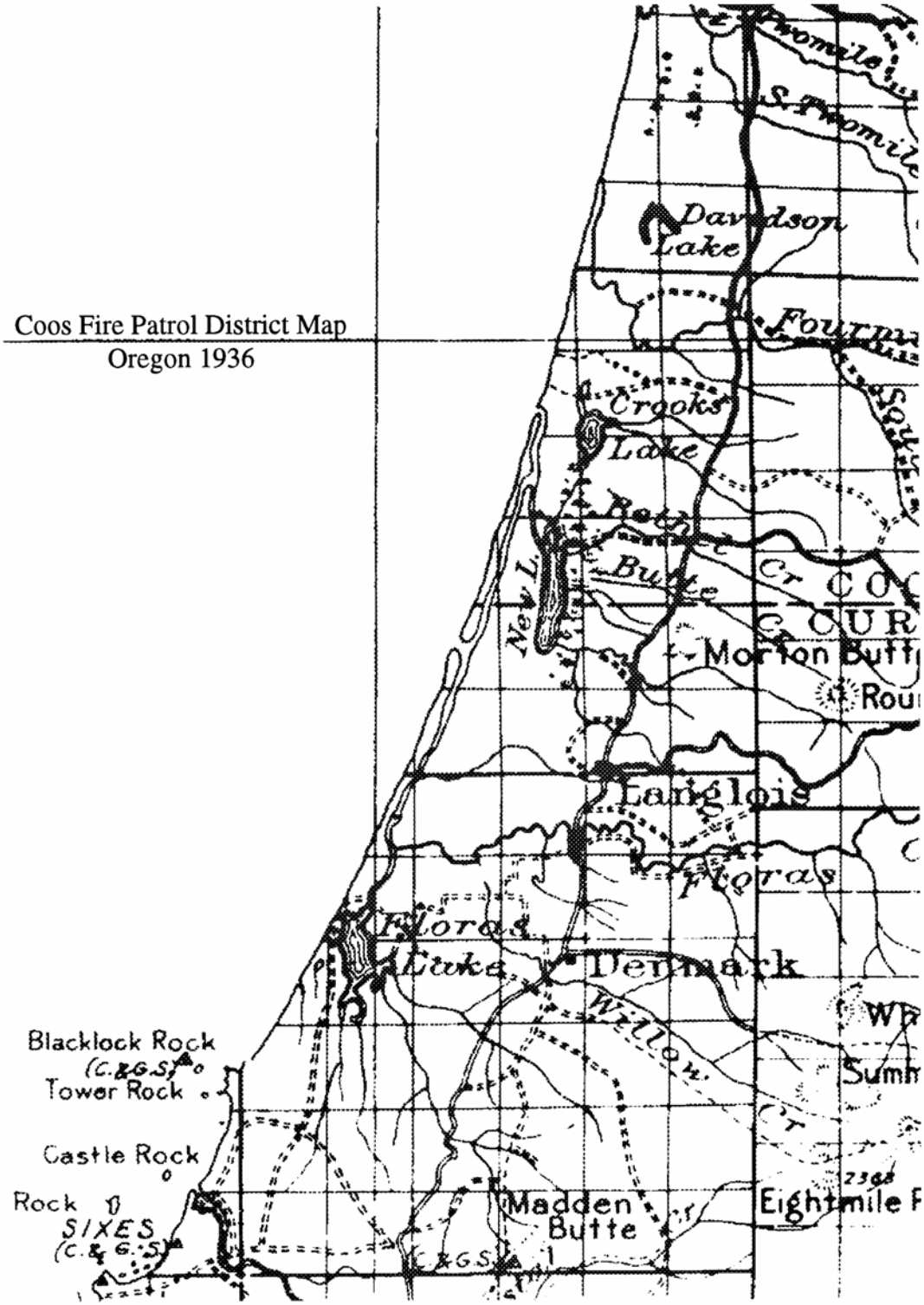
Monitoring may include these categories: resource management of fish, wildlife, special status species, wetland, water, geomorphology, and cultural values; livestock management; recreation and visitor use management; environmental education and interpretation; and site administration and development for visitor facilities and access.

Monitoring is a key component of adaptive management and will introduce new information that gives a clearer picture of the changing environment at New River and help make management of the area more accountable and responsive.

Figure 1. Adaptive Management Process Flowchart



PART ONE
INTRODUCTION



PART 1 – INTRODUCTION

History of New River

In 1851, John Kirkpatrick led an expedition through the area north of Floras Lake. He described the land bordering the Pacific Ocean as a “great swamp,” dominated by large expanses of water containing wet meadows, backwater marshlands, and spruce swamps. At that time, a vast floodplain connected a network of small creeks, lakes, and rivers that drained the area.

California’s 1849 Gold Rush created a new market for farm goods from the north, enticing settlers to cultivate the rich lands of coastal Oregon. In 1856, the area east of New River was first homesteaded. The new tenants brought with them cattle, dairy cows, sheep, and other grazing animals. Dairies and cheese factories, some of which exported world-class quality products to Europe, sprang up along the southern Oregon Coast. The discovery of gold on the Sixes River later that year drew prospectors and more settlers to the region, increasing the local demand for dairy and meat products. This in turn produced a need for more pastureland.

Historic Langlois, looking north on Main Street (present-day Highway 101). ***Photo Credit: Bandon Historical Society***

Draining wetlands for farming and grazing was a common practice of homesteaders as they settled the Western United States and was soon applied to much of the wetland along the Oregon Coast. Digging drainage ditches allowed water to easily run off the area, leaving a dry meadow or pasture. These artificial channels carried water much more quickly into tributary streams and eventually the ocean. These

activities are still practiced today, and many ditches continue to be cleaned and maintained to keep water from inundating pasturelands.

According to local lore, the formation of New River began during the Great Flood of 1890. This flood washed through Floras Creek, wiping out a number of farms in its wake. But rather than flowing over wind-swept sand dunes that temporarily blocked the mouth of Floras Creek to the ocean, the floodwaters carved a new channel that flowed north, parallel to the ocean. In seeing this, local rancher Louis Knapp Sr. proclaimed, “It’s a new river!” New River in fact is just an extension of Floras Creek that was created in the old deflation plain of the shoreline sand dunes.

In the late 1800s, another factor came into play that would further transform the landscape. To prevent the encroachment of shifting sands, non-native European beach grass was planted along the Pacific Northwest Coast to protect roads, shipping channels, and other infrastructure. This exotic plant quickly began colonizing the open sand dunes along New River in the 1930s and 1940s. With its remarkably long and tenacious root system, the grass restricted sand movement. As a result, the accumulated sand raised the height of the foredune between New River and the ocean. This elevated foredune served as a barrier to ocean tides which had breached the dune at varying points through the years. Once stabilized, the foredune reduced New River’s contact with the ocean. Consequently, New River continued to carve its way further north before eventually finding an outlet to the ocean.

New River, looking north from Storm Ranch.

By the mid 1950s, New River had carved its way six miles along the coast, merging with Croft Lake outlet before draining into the ocean. The river’s mouth continued its northward migration, and by the early 1980s it had moved another two miles, merging with Fourmile Creek. By 2004, New River measured over nine and a half miles long, entering the ocean at its confluence with Twomile Creek. If left undisturbed, the mouth may continue its progress northward another three miles until reaching sandstone

formations at China Creek. New River remains an extremely dynamic and unpredictable system, a model of nature's response to human alterations.

Additional information about the history of New River can be found throughout Part Two and in Appendix A: Chronology of Events.

A Land of Varied Uses

Most of the visitors to New River come to enjoy recreational activities such as fishing, boating, bird watching, hiking, picnicking, and sightseeing. Most of the users express an interest in preserving the area in its natural state and keeping it undeveloped, especially in view of the influx of people along the southern Oregon Coast.

Oregon's population growth is affecting the region by increasing real estate values. Large open tracts of land are being purchased by developers or subdivided and sold for home sites. The private lands surrounding BLM-administered areas at New River are used for various economic or recreational pursuits including:

- Ranching
- Cranberry farming
- Small woodlots
- Private residences, summer homes, and other housing developments
- Bed and Breakfast businesses

Purpose and Scope

This plan update provides direction for comprehensive management of the New River ACEC and any additional acreage acquired for inclusion into the ACEC.

The purpose of the plan update is to address changes that have occurred since the New River ACEC Management Plan was completed in May 1995. Such changes include clarification of the management direction as well as accomplishments and on-going management actions set out in the original plan. This update also explains what we have learned thus far about the natural and cultural resources of the area, it identifies some gaps in our understanding of this dynamic system, and it provide ideas for future research.

Planning Framework

In the BLM planning system there are three levels or tiers:

1. Policy (national and regional level directives)

2. Coos Bay Resource Management Plan (May 1995)

3. Activity Plans (site-specific plans such as this one)

Support at the National Level . . .

Many of the goals and objectives embraced in the New River Management Plan complement Bureau-wide and regional initiatives. The Fish and Wildlife 2000 program, at both the national and regional (Oregon/Washington) levels, for example, call for maintaining sufficient quantity and quality habitat to ensure an abundant and rich diversity of wildlife, fish, and botanical resources. These programs endorse public outreach, including education, to promote widespread understanding of BLM management efforts. These efforts include collaboration with other federal agencies, organizations, and landowners in management actions that contribute to species recovery.

Watchable Wildlife, Adventures in the Past, and BLM's Priorities for Recreation and Visitor Services are three programs that underscore the importance of maintaining a diversity of natural resources like those at New River. A major focus of Watchable Wildlife is providing wildlife viewing areas and educational opportunities. Adventures in the Past creates educational opportunities and teaches stewardship of cultural resources. BLM's national goals for recreation and visitor management are:

- Improve access to appropriate recreation opportunities on lands and waters managed by the Department of the Interior.
- Ensure a quality experience and enjoyment of natural and cultural resources on lands and waters managed by the Department of the Interior.
- Provide for and receive fair value in recreation.

. . . And at the District Level

The Coos Bay District operates under its Resource Management Plan (RMP), as supplemented and amended, which is in conformance with the Final Environmental Impact Statement on Management of Habitat for Late Successional and Old Growth Forest Related Species within the Range of the Northern Spotted Owl and its Record of Decision, as supplemented and amended (Interagency, 1994). The Coos Bay District RMP addresses the designation and management of special areas such as New River to protect their unique natural, cultural, and recreation values.

The People and the Process

In March 1992, the BLM hired a Natural Resource Specialist to oversee the planning process and compile, edit, and write the New River ACEC Management Plan. That summer, BLM formed a citizen steering committee to provide public recommendations for the plan. These individuals lived near New River and had an avid interest in the area. The members represented a cross section of the local community, businesses, and other interests.

An internal BLM group was also formed, known as the interdisciplinary team. This team of BLM specialists brought their professional expertise and experience to the issues and concerns of New River. The formation of this group is required under National Environmental Policy Act (NEPA) regulations. NEPA regulations also require public involvement and comment through the planning process. The citizen steering committee provided early public input and guided the plan's direction from its conception. The steering committee and interdisciplinary team met periodically to define the plan's goals, objectives, and management actions. Many sensitive issues were also discussed in the process, such as

off-highway vehicle (OHV) use, visitor use levels, artificial breaching of the foredune, and proposed guidelines for waterfowl hunting and fishing.

Once the groundwork of the plan was laid, the interdisciplinary team completed an Environmental Assessment (EA OR 128-93-15) to insure that no significant adverse impacts to the area would result. This EA led to a Finding of No Significant Impact (FONSI) and a Decision Record that was signed by the BLM Field Manager on April 7, 1995. After more than three years of intensive planning, the Final New River ACEC Management Plan was published in May 1995.

Over the next nine years, a majority of the plan's management actions were implemented by the BLM. In late 2003, it was determined that a plan update was necessary to describe accomplishments, provide up-to-date resource information, and clarify management direction for the ACEC. A new BLM interdisciplinary team was then formed to update the plan. Since the plan update does not change the intent of the original management plan, a new Environmental Assessment is not required.

BLM Interdisciplinary Team Members

Chris Church	ACEC Manager, Team Lead
Nancy Brian	District Botanist
Tim Barnes	District Geologist
Dan Carpenter	District Hydrologist
Jay Flora	Natural Resource Specialist (GIS Mapping)
Jim Heaney	Wildlife Biologist
Sharon Morse	District Interpretive Specialist
Pam Olson	Fisheries Biologist
Kerrie Palermo	District Wildlife Biologist
Reg Pullen	Outdoor Recreation Planner
Paul Rodriguez	Realty Specialist
Steve Samuels	District Archaeologist
Dennis Turowski	Natural Resource Staff Administrator
Dave Wash	District Outdoor Recreation Planner

PART TWO
SETTING AND RESOURCE VALUES

PART 2 – SETTING AND RESOURCE VALUES

The New River Area

This management plan update describes BLM's approach to managing 1,356 acres of public lands located in the New River area. These lands are designated an Area of Critical Environmental Concern (ACEC), because they contain special status wildlife and plant species, rare habitats, cultural resources, and unique recreational opportunities for the public. New River is the focal point of the management area, which extends for nine and a half miles along the southern Oregon Coast from northern Curry County to southern Coos County (Map 2). New River also flows through a variety of other public and private ownerships, including: Coos and Curry Counties, State Parks, and private ranch and rural residential properties. In total, BLM manages approximately 60% of lands adjacent to New River, 25% is in private ownership, the State of Oregon owns 10%, and Coos and Curry Counties own 5% combined.

How to Reach New River

Storm Ranch

From Highway 101, the public can access the New River ACEC at four different locations. The central and most widely-used access point to the ACEC is via Croft Lake Lane, located eight miles south of Bandon. This portion of the ACEC is referred to as Storm Ranch, named after the long-time owners of the property before eventually being acquired by the BLM. It offers the best access for hiking, boating, fishing, and picnicking. Entry into the area is controlled by an entrance gate, which is open year-round from sunrise to sunset.

Floras Lake

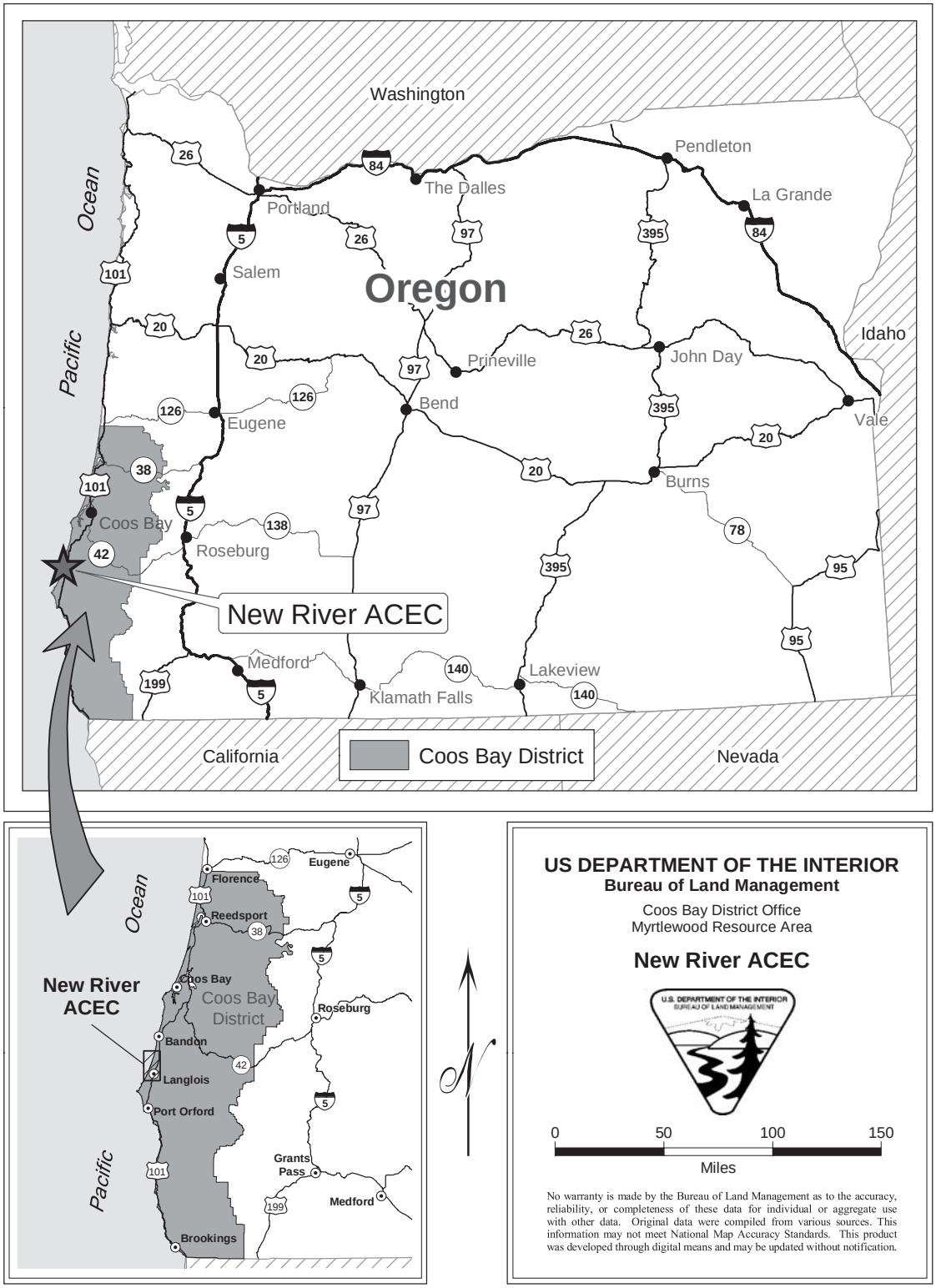
The southern access point to the New River ACEC is at Floras Lake. Visitors can park in the lower day-use parking lot of Boise-Cope County Campground. A footbridge over the lake outlet provides hiking opportunities to the beach. Access for boating begins at the boat launch just north of the footbridge. Boaters can float down the outlet to New River and eventually paddle to takeout points at Storm Ranch and Lower Fourmile Road, a distance of approximately eight and ten miles respectively.

Fourmile Creek

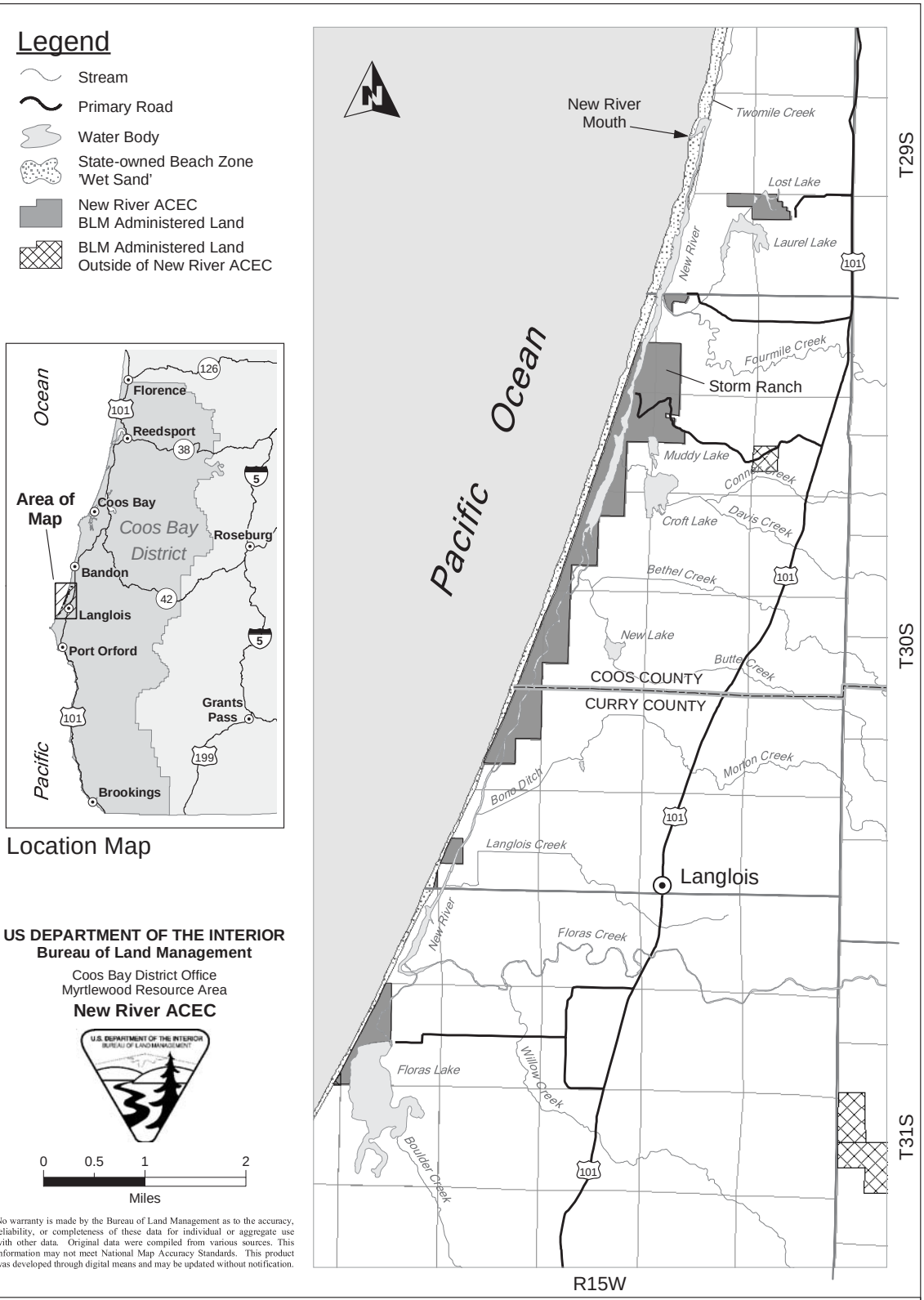
A third access point to the ACEC is via Lower Fourmile Road. A small gravel parking area is located on the south side of the road before it makes a sharp curve to the north. At this point, a trail leads into a fenced meadow where visitors can proceed on foot to New River. This short hike provides an opportunity to portage a canoe or kayak out to the river. Private property surrounds this small, isolated parcel, and visitors are asked to respect the privacy of the residents.

Lost Lake

The northernmost entrance into the ACEC provides access to an isolated BLM parcel that surrounds Lost Lake. This area can be reached via McTimmons Road to Woods Way. A foot trail begins at a small parking lot on the east side of Lost Lake. The trail borders the southern edge of the lake and leads to a series of large sand dunes. Traversing the dunes will lead visitors to New River and the ocean. The Lost



Map 1: New River Vicinity



Map 2: New River ACEC

Lake portion of the ACEC is bordered to the west by Bandon State Park and Coos County land. All other lands surrounding Lost Lake are privately owned. Visitors are asked to respect the privacy of the residents.

Social and Economic Factors

According to the 2000 census, Coos and Curry Counties have populations of 63,000 and 21,000 respectively. Communities in the general area of New River include: Bandon (population 2,833), Port Orford (population 1,153), and Langlois (population 593) (U.S. Census Bureau 2000).

Primary industries in the two counties are timber, fishing, farming, ranching, and tourism. In the timber and fishing sectors, employment has dropped considerably. In contrast, tourism in Coos and Curry Counties is on the rise. Each year between Memorial Day and Labor Day, several hundred thousand tourists travel through the two counties on Highway 101.

A shift in industry focus is not the only changing socio-economic factor on the southern Oregon Coast. Another is the demographic trend in Coos and Curry Counties as growing numbers of retirees and urbanites relocate to the Oregon Coast from metropolitan centers. Also encouraging the coastal population influx, until recently, were low housing and real estate costs. Many people from other states have purchased property for retirement or speculative purposes. Conversely, rising property and housing costs and unemployment are contributing to an exodus of longtime local residents. Particularly affected are those associated with struggling industries who are seeing their livelihood disappear.

Given these socio-economic changes, the two counties are realizing the importance of their tourism industry and are making plans to expand their appeal. Communities such as Coos Bay and Bandon for example, are upgrading their downtown areas. In Langlois, old, distinctive buildings are being converted to businesses such as art and antique shops. Along the Highway 101 corridor, many homes are now being used for commercial pursuits such as bed and breakfast operations or gift shops. In addition, both Coos and Curry Counties have completed tourism development plans in the last decade as part of their overall economic strategies. Both plans emphasize nature-based tourism as a major component to achieve economic growth.

The New River ACEC plays a role in the socio-economic conditions of the region. First, New River offers opportunities for the counties to achieve nature-based tourism goals. In addition, the protected natural environment of the New River ACEC adds economic value to adjacent private properties. Finally, capital developments that BLM has added at New River to support outdoor recreation are solid investments that add to the quality of life for those living in the region. All of these values can in turn enhance the region’s ability to attract outside business investment.

Another major social and economic element in both Coos and Curry counties is the large rural population. Most of this sector depends on agricultural commodities such as small private woodlots, dairies, cranberry farming, and cattle and sheep ranching. Of these, the cranberry industry has shown the most increased activity, with bog development up 37% in the mid 1980s and 1990s (Ocean Spray Cranberries, Inc. 1993). This is particularly evident on private lands surrounding the northern portion of the ACEC along Croft Lake Lane.

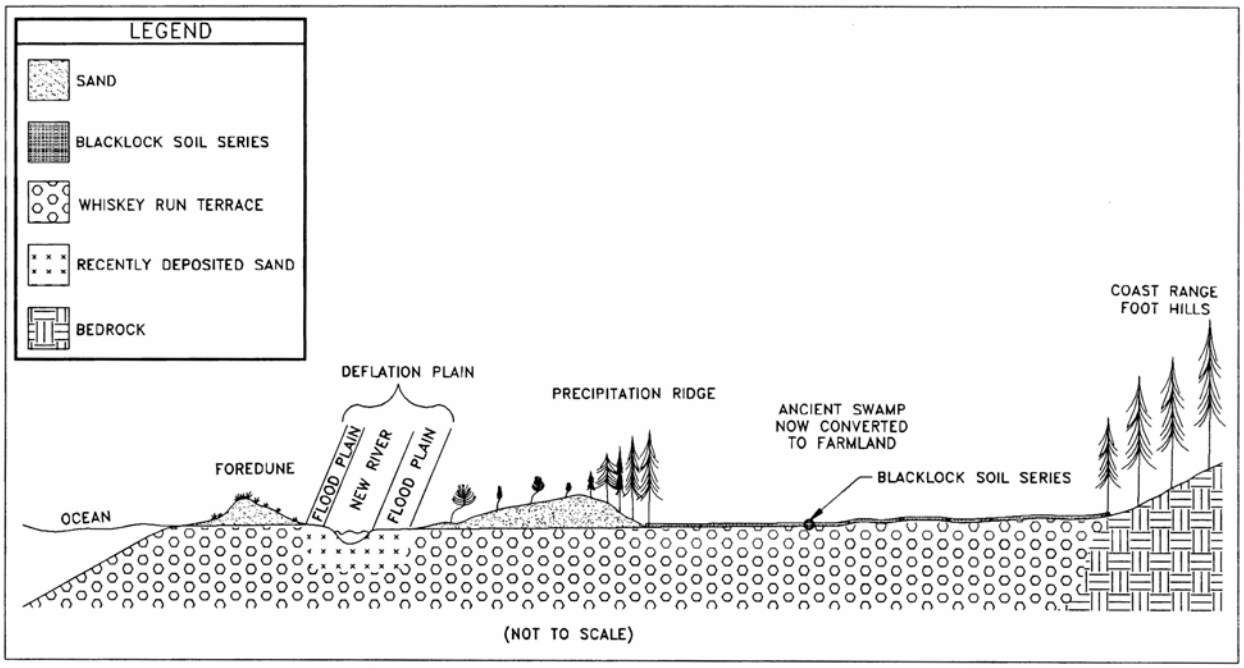
Modern-day Langlois, looking north on Main Street (present-day Highway 101).

Livestock grazing has been a dominant economic use of the New River area since the mid-1800s with the arrival of the first homesteaders. Over the years, grazing conditions improved by clearing land and draining wetlands. Currently, several large working cattle and sheep ranches are located along New River's southern reaches. Some of these ranchers had grazing leases with the BLM in the New River ACEC. These leases have since been cancelled and cooperative management agreements have taken their place. The purpose of establishing these agreements is to adjust livestock grazing practices in order to better protect sensitive riparian and wetland habitats along New River. See Objective 10: Coordination and Cooperation.

Geology

Sand deposition and erosion from the ocean has played a major role in creating the current landforms and water movement patterns seen today at New River. The most common landforms in the New River area include: the beach, foredune, deflation plain, floodplain, precipitation ridge, and terraces.

Figure 2. Geological landforms of the New River area



The best known and most recent terrace is the Whiskey Run Terrace. The minerals composing this terrace include coarse to fine quartz, various plagioclases, opaque mica, amphiboles, pyroxenes, and other minor silicate minerals. The deposit is a relatively thick layer, possibly as deep as 500 feet in places. It was deposited approximately 10,000 years ago during the Pleistocene Ice Age. During the late Pleistocene, the area was part of a long, flat beach which extended between Charleston and Port Orford.

This beach was uplifted by plate tectonics and then dissected by the small streams flowing from the Coast Range. Rising sea level, since the last ice age, has covered some portions of the Whiskey Run Terrace along the coast. Inland areas are now colonized by vegetation.

Common soils at New River, developed on the Whiskey Run terrace, include the Blacklock soil series which is characterized by a partially cemented layer about a foot below the surface. The hardpan layer makes water infiltration difficult, causing it instead to collect on or near the soil surface. This feature makes Blacklock soils favorable for wetland development such as cranberry farming.

The New River Spit is located within the Bandon Littoral Cell. The cell is bound by Blacklock Point to the south and Cape Arago to the north. The total shore length of the cell is approximately 27 miles. The littoral cell does not allow for migration of sand sediment beyond the bounding points of the cell (Komar et al. 1999).

The bedrock geology underlying the New River Spit area consists of Jurassic Otter Point Formation (Ramp and Gray 1977) and possibly Eocene Roseburg Formation (Phillips et al. 1982), later defined as Siltez River Volcanics by some and the Umpqua Group by others. The Otter Point Formation consists of sandstone, siltstone, mudstone intermixed with meta-sediment, and metamorphic rock within a mélange. The mapped Roseburg Formation consists of sandstone with siltstone and mudstone. However, the New River Spit is impacted by the Quaternary sediments of sand forming the beach and accompanying dune field. The sediment on the southern portion of the spit is coarse, derived from Blacklock Point and adjacent sea cliffs. In general, sea cliff erosion in the Bandon area is minimal because tectonic uplift exceeds sea level rise, giving a net decline in sea level. Erosion from the sea cliffs is due to groundwater movement as opposed to wave action (Komar 1997). Blacklock Point is mapped as ultramafic rock containing serpentinite and peridotite. The sea cliffs directly north of Blacklock Point have been mapped as containing Pleistocene marine terrace sediments (Komar et al. 1999).

Sediment for the northern portion of the spit may be supplied by the Coquille River (Komar et al. 1999). However, in other writing by Komar (1997), it is suggested that the sediment provided by an estuarine system is very limited and that beach material has been provided by sea cliffs and prehistoric material from the Columbia River Drainage. The only contribution of sediment from New River itself is from the erosion of sand dunes and overwash sediment, resulting from a recycling of former beach sand. The principle loss of sand from the beach occurs when it is blown inland to form dunes (Komar et al. 1999).

The New River Spit contains characteristics of a dissipative beach along the northern, finer-grained beach and characteristics of a reflective beach along the southern, coarser-grained beach. The dissipative beach tends to be more stable, responding less to major storms and undergoing smaller changes in elevations from summer to winter. The reflective beach tends to be less stable, changing rapidly in slopes and elevations during individual storms and from summer to winter (Komar et al. 1999).

The most significant change in the New River Spit is the progressive migration of New River's mouth to the north, which has shifted its position by 2.9 miles in 30 years (Komar et al. 1999). Related to this shift northward has been the explosive growth of dune vegetation during the last century. European beach grass was first introduced to the North Spit, Coos Bay, in 1891 to control dune movement, but rapidly spread along the coast soon thereafter (Beckham 2000). During the 1930s it became established in the New River area (BLM 1995, as found in Komar et al. 1999), and its effect on the stability of the spit has been significant. The creation and elevation of the foredune has served as a barrier to high tides and storms, increasing the stability of the spit where the foredune has not been cut away by breeching events (Komar et al. 1999).

There has been a progressive increase from north to south in the elevations of the toe of the foredune, ranging from about 10 feet in the north to 22 feet in the south, based on National Geodetic Vertical Datum. This is due to the presence of coarser sediment of the beach allowing for greater elevation gain in wave run-up. Coarser grained sands maintain a higher angle of repose than fine grain sands due to functions of the angle of internal friction (Easterbrook 1993).

At present, the level of stability of the New River Spit varies along its length, with it being unstable to the north where the foredune elevation is low, permitting frequent storm overwashes and unstable at the south where breaching is likely to recur due to the sharp bend in the river. The spit is relatively stable along its central stretch where high dunes have developed (Komar et al. 1999). This analysis was completed before the removal of European beach grass and the reduction of dune elevation which began in the late 1990s.

Long-term tectonic and catastrophic seismic events could have impact on the New River Spit. Currently, tectonic uplift of the North America Plate at the New River Spit site exceeds the current rise in ocean levels by 0.7 millimeters per year (Komar et al. 1999). This small amount of rise may have little impact

on the spit. However, the tectonic rise is believed to be the result of plate binding within the Cascadia Subduction Zone. Historic records show that every 400 years (+/- 200 years) the plate binding is released, resulting in a Cascadia event tectonic movement (Komar et al. 1999, Priest 1995b, Peterson et al. 1997). This movement can result in a subsidence of the North American Plate of several feet, effectively "raising the sea level" along the spit, allowing for erosion, overwash, and relocation eastward of the beach.

Other events can deliver a series of waves related or unrelated to plate subsidence. These tsunamis, whether from a Cascadia Event, other distant plate movements, or submarine landslides, may deliver waves with sufficient height and energy to overtop the spit, relocating sand and dune and creating breaches. Such effects were witnessed on the New River Spit from tsunamis delivered by the 1964 Good Friday Earthquake in Alaska (Komar et al. 1999). The spit has been mapped to be 1.3 miles within the tsunami run-up boundary (Priest 1995a).

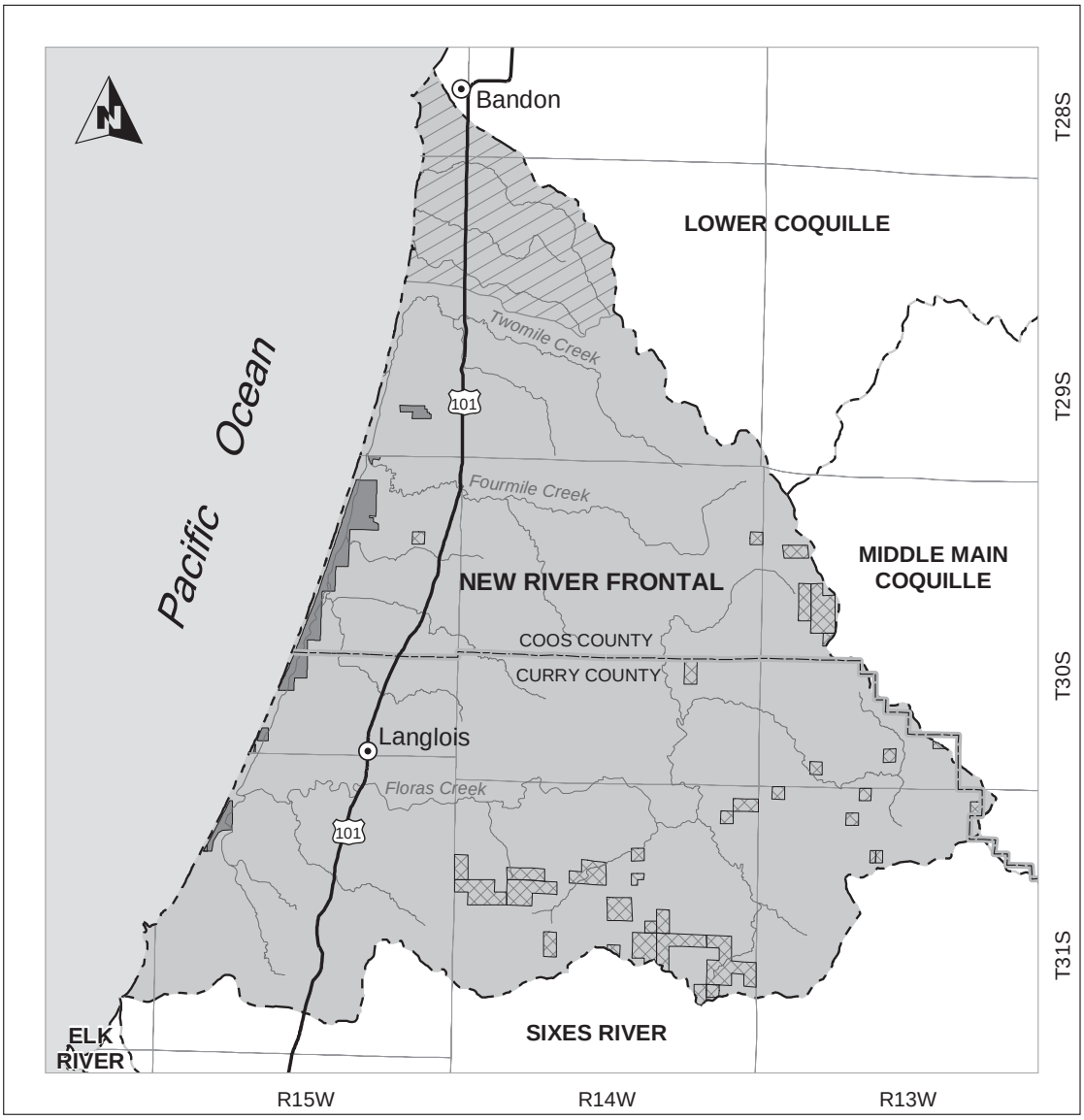
Review of aerial photographs show the mobility of sand within the New River Spit and the subsequent stabilization and starvation of the dune field due to the encroachment of European beach grass. The coastal lakes east of the New River Spit are dune impounded features, formed by the blocking of drainages from migrating dunes. Aerial photographs from 1932 show active dune fields within and east of the present New River. The point where the active dune field stops to the south is also the terminus of the New River northerly flow.

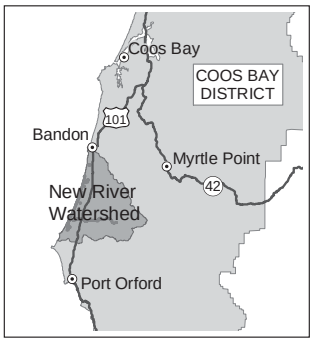
A dune field is supplied by sediment from beach sands. When that supply is disrupted, the dune will remove sand from the eastern edge of the disruption and can create a deflation plain. The deflation plain will expand as the dunes within the dune field migrate. The dune will continue migration until there is no more sediment to supply it. As sediment supply is reduced to the precipitation ridge and the dune, vegetation will encroach, stabilizing the dune. This process appears evident in the historic aerial photography of the New River Spit. However, as proposed by Komar (1997), stabilized dunes (both dune fields and foredunes) can be reactivated. A possibility does exist that removal of stabilizing vegetation from the foredune can reactivate the dune field progression, greatly impacting the deflation plain with new sediment. Monitoring will be established to track this possibility.

In 1993, a mineral withdrawal from mineral entry under the Mining Law of 1872 was placed on the New River ACEC, closing it to mining claims.

Hydrology

Unlike a classic watershed, New River receives flow from multiple drainages along its nine-and-a-half-mile length, and depending upon conditions, may have zero to multiple discharge points to the Pacific Ocean. New River begins as a lower river extension of Floras Creek, which has a drainage area of 70 square miles (mi^2). As New River flows further north, it gains additional waters from the Floras Lake drainage (12 mi^2); Morton Creek, Butte Creek, Bethel Creek, Davis Creek, Conner Creek, New Lake, and Croft Lake drainages (23 mi^2); Fourmile Creek drainage (22 mi^2); and Twomile Creek drainage (15 mi^2). Collectively, 142 square miles of surface area contribute to the New River watershed.





Location Map

Legend

- 5th-Field Watershed Boundary (Labeled with watershed name)
- Major Stream
- Primary Road
- Township Line
- Water Body
- New River Frontal Watershed
- Non-Contributing Area to New River
- BLM Administered Land New River ACEC
- BLM Administered Land Outside of New River ACEC

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Coos Bay District Office
Myrtlewood Resource Area
New River ACEC

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Map 3: New River Frontal Watershed

New River is best described as a D5c-D6c stream under the Rosgen stream classification system (Rosgen 1994). This means the river has a fairly straight, unconfined channel (water can easily flow over the banks during heavy precipitation). It also has a very low gradient, sand/silt bed with occasional multiple side channels. Uncharacteristic of most rivers, New River runs parallel to the ocean and is separated by a foredune along its entire length. The river periodically breaches over the foredune during winter storms, leading to dramatic shifts in water levels. The ocean can also wash over low areas of the foredune when rough seas and wave run-up conditions occur. This process carries sand and log material into the river and leaves deposits, often narrowing the river in the vicinity of an overwash.

New River between New Lake and Croft Lake outlets.

Riparian/wetland types at New River can be distinguished by salinity levels ranging from saltwater to freshwater. This range of salinity creates three distinct areas along the river: estuarine tidal, where active mixing of salt and fresh water occurs; inter-tidal, where some salt water is present; and riverine, found in the 'upper' reaches of New River, which has no salt water influence.

In addition to wetlands found along the river margins, freshwater wetlands occur inland in topographical depressions (Cowardin 1979). These wetlands vary in type depending on vegetation, hydrological characteristics, and soils. Wetland habitats are further discussed in the Botany section of this plan.

Seasonal rains and runoff patterns have a major effect on New River. More than 80% of annual runoff occurs between November and April coinciding with precipitation patterns. Less than one percent of runoff occurs in the months of August and September. Annual runoff in the watershed averages about 50 inches, and annual yield measures approximately 340,000 acre feet of water.

Like other coastal waterways which empty into the ocean, New River experiences a yearly cycle of change. Near the ocean entrance, the shallow bed allows incoming tidal saltwater to mix easily with the river's freshwater. When the river is open to the sea (usually late fall through spring), these estuarine conditions develop in the northern third of the river. These conditions can also develop in the vicinity of other temporary breaches that occur along the river during extreme flooding events.

During the dry season (late summer and early fall) when stream flow dwindles, northwest winds blow sand across the river mouth which usually closes it. This yearly blockage causes the river to resemble a long, narrow lake. When this occurs, salinity levels diminish and the effect of tides cease in the northern portion of the river. In early summer, average monthly river flow falls to 70 cubic feet per second (cfs) and may drop to less than 10 cfs later in the season. This low-flow condition may cause shallow sections of the river to dry up entirely. This persists until the rains begin again in late fall or early winter, which eventually leads to the river once again breaching across the closed mouth along the foredune.

During winter high flows, the river has maximum energy available to push the mouth further north. This continued northward movement depends on several factors, including: changes in stream slope, width, and depth; water flow and volume; sediment supply; prevailing winds; storm surge; and ocean tides.

Natural mouth of New River at its confluence with Twomile Creek and the ocean.

Another important factor that can limit the northward movement of the river is a temporary breach in another location further south. Occasionally, New River either naturally or artificially breaches across the foredune in areas other than the natural mouth on the northern end of the river. Conditions which naturally contribute to foredune failure include out of bank flows and flooding conditions, river meander patterns which direct higher velocity water into weak locations along the foredune, high tides, and pounding surf.

Historically, one of the more persistent breaching locations has been at the sharp bend of Floras Creek due to fast moving, high-volume flood waters. When the foredune naturally fails or is mechanically breached at this location (as described later), water flow in New River reverses instead of continuing north. This flood relief, whether natural or aided by man, has changed important river channel and bed-form dimensions. For example, north of Bono Ditch, a rise in river elevation has developed. This high spot can cause the channel to fill with sediment, which accentuates channel drying in late summer.

New River breach at the sharp bend of Floras Creek.

Since the 1920s, local residents have mechanically breached New River. This typically occurred in the fall, to allow salmon early entry for fishermen, or in the winter to relieve flooding of low-lying farm and pasture land.

Moderate winter flooding (though at times disruptive to surrounding farms) results in rich deposition of silt deposits along the floodplain and an enhancement of plant growth. Flood waters also allow recharge of the surrounding groundwater table which supports a variety of wetlands and helps to sustain the river flows later in the summer.

New River is young, dynamic, and ever-changing. The river currently shows signs of establishing more defined meanders; more stabilized, vegetated banks; a deeper, narrower channel; and better floodplain connections. However, periodic flooding, ocean over-washing through low spots in the foredune, and wind-blown sand processes cause localized shifts in the river from a more mature back to a juvenile stream state. This interaction of hydrological, morphological, and climatic changes will continue to yield a dynamic river system.

Additional discussions about the hydrology of New River are found in Appendix A: Chronology of Events, and Appendix B: Hydrology of New River.

Water Rights

Oregon water laws and appropriative water right procedures are administered by the Oregon Water Resources Department (WRD). In the New River area, water is used for both domestic and agricultural purposes including: rural residential use, forestry, dairy, ranching (irrigating pastures), and cranberry farming (irrigating cranberries during the growing season and flooding of bogs during harvest time). Water rights information is available from the local watermaster and listed by: stream name, source, priority date,

total allocation of water in cfs. In addition to the current water rights, there are a number of surface and groundwater rights pending in the New River watershed.

In addition, the Oregon Department of Fish and Wildlife (ODFW) has an in-stream water right on Floras Creek to protect fish during low-flow conditions. This ODFW water right assures that there is minimal stream flow present on the lower two miles of the creek during the summer.

Surface and groundwater withdrawals are reducing stream levels in some areas of the New River watershed. This is particularly evident in late summer and early fall when rainfall is lowest and water diversion and groundwater pumping are highest. Studies are needed to determine how groundwater pumping is affecting annual recharge.

Botany

The vegetation at New River is typical of the Oregon Coast, consisting of plant communities on open and stabilized sand dunes, wetlands, and upland shrubland, woodland, or forests. The steep foredune along the beach is backed by a sandy spit that is covered with European beach grass. The deflation plain behind the spit contains the waters of New River. The shores of New River are bordered by a narrow strip of riparian vegetation. This is backed by an herbaceous community, which transitions into a shrubland, woodland, or forest. The latter varies depending upon the time since the last disturbance, the species present, and the amount of cover (Wiedemann 1969, Franklin and Dymess 1973).

The sandy landscape of the New River ACEC is composed of many landforms: beaches, foredunes, deflation plains, interior dunes, rivers and streams, lakes and ponds, and salt marshes. The disturbance processes that affect plants in these habitats include shoreline displacement, ocean overwashes, wind, fire, insects and pathogens, livestock grazing (in some designated areas), changes in hydrology, and human activity. Plant succession from bare sand to climax forest does occur over time in sheltered sites; however, disturbance processes usually intervene to disrupt this pattern at most sites.

A 1958 vegetation map of New River ACEC drawn from 1939 aerial photos (Cooper 1958) shows a foredune stabilized by European beach grass, interspersed with an open sand dune community and some wetlands. This is substantiated by anecdotal accounts from long-time local residents that the shrub and forest communities have increased dramatically in the last thirty years (R. McKenzie pers. comm. cf Christy 1981). Christy (2000, 2002) prepared a map of the historic vegetation of New River based upon turn of the century transcriptions completed by General Land Office surveyors in 1857 and 1880. This vegetation map supports the theory that the New River area was composed primarily of open, shifting sand dunes bordered by vast wetlands.

A 1981 vegetation analysis documented 22 plant communities (Appendix C, Christy 1981). Seven of these communities were discussed in the original New River ACEC Management Plan (BLM 1995). A recent botanical survey inventoried sedges at four New River sites and noted new collections not previously published (Zika et al. 1998). A few horticultural introductions are found around the Ellen Warring Learning Center.

Plant Communities

The New River plant communities include about 330 vascular and about 45 non-vascular species (Appendix C). About 70 species (or 19%) are non-native or exotic. The number of non-vascular species is

likely to increase as more areas are surveyed. Also, the number of exotic and horticultural species is expected to increase along roadways, trails, and areas of human activity as seeds are brought in by people, pets, livestock, and vehicles.

Five vegetation classes, as defined by The National Vegetation Classification Standard (The Nature Conservancy 1994, see http://biology.usgs.gov/npsveg/nvcs.html) are present at New River. The vegetation classes are based upon the structure or physiognomic characteristics of the vegetation or species present, as well as the percentage of cover.

Within the five vegetation classes are many alliances and plant associations that are arranged along gradients of moisture, stand structure, soil development, and successional age. An alliance is a physiognomically uniform group of plant associations sharing one or more diagnostic species that are dominant, differential, indicator, or characteristic. These, as a rule, are typically found in the uppermost strata of the vegetation (Muller-Dombois and Ellenberg 1974). It is likely that the area may have up to 50 or more plant associations, similar to that found at the Oregon Dunes National Recreation Area, located about 65 miles to the north of New River (Christy et al. 1998). A complete vegetation classification for New River is needed to determine these associations.

New River's five vegetation classes are: forest, woodland, shrubland, dwarf-shrubland, and herbaceous. Following is a brief description of each:

Forest

A forest vegetation class has trees with overlapping crowns that generally form 60 to 100% of cover. It is composed of evergreen and deciduous forest species that are upland, seasonally flooded, or saturated. At New River the forest contains Sitka spruce, Douglas-fir, western hemlock, shore pine, madrone, Port-Orford-cedar, and red alder. Numerous shrubs are present, the most common being hairy manzanita, evergreen huckleberry, and salal.

Woodland

A woodland vegetation class has open stands with crowns not usually touching that generally form 25 to 60% of cover. It is composed of evergreen forest species that are upland. A shore pine and Sitka spruce woodland dominates the easternmost portions of the ACEC. The shore pine community consists of two types, depending on the amount of moisture. In drier areas the understory is scattered with European beach grass and mosses, and in wetter areas the understory consists of sedges and willows.

Shrubland

A shrubland vegetation class is greater than 0.5 meters tall and generally has greater than 25% of cover. (Tree cover, if present, is generally less than 25%.) It is composed of deciduous shrubs that are upland, seasonally flooded, or saturated. At New River, this community is composed of Hooker willow, Douglas spiraea, manzanita species, slough sedge, and European beach grass. Upland shrub areas are located east of the river and generally in the northern portion of the Storm Ranch area. The wettest areas are along the river.

Dwarf-shrubland

A dwarf-shrubland vegetation class is composed of shrubs less than two feet tall with cover generally greater than 25%. (The tree cover, if present, is generally less than 25%.) At New River, this community

is composed of deciduous dwarf-shrubs, such as bog blueberry, and is seasonally flooded. Sphagnum moss is nearly always present among the stems of the bog blueberry.

Herbaceous

An herbaceous vegetation class is composed of graminoids, forbs, and ferns. Cover is generally greater than 25% and if present, trees and shrubs generally produce less than 25% of the cover. There are several community alliances within the following three associations: (1) perennial grasses that are upland, seasonally flooded, or tidally flooded, (2) perennial forbs and ferns that are upland, seasonally flooded, and semi-permanently flooded, and (3) hydromorphic rooted vegetation (meaning non-emergent grasses and forbs structurally supported by water) that is permanently flooded.

Wiedemann (1984) lists nine dune maritime endemics species that are herbaceous. These species only occur on the beaches and dunes of the Pacific Coast of North America. Of these, eight are known to occur at New River: yellow sand-verbena, silver bursage, American glehnia, beach pea, beach evening-primrose, seashore bluegrass, black knotweed, and dune tansy.

Open sand dunes are naturally created and maintained by wind and water. Open dunes are scattered on the ACEC, but they have been in a state of decline since 1891 when European beach grass was first introduced along the Oregon Coast (Beckham 2000). This historic habitat may be restored by active vegetation management techniques, such as disking, bulldozing, and hand pulling of vegetation. These restorative techniques are currently being implemented by the BLM in portions of the ACEC.

Meadows, grasslands, and pastures occur in the eastern portion of the ACEC and are also interspersed throughout the other upland habitats. Species present in these communities include tufted hairgrass, California oatgrass, Oregon-grape, red barberry, Fremont's deathcamas, mountain iris, and cat's-ears. Wetlands are scattered throughout the ACEC in the form of fens, ponds, mudflats, freshwater marshes, and salt marshes. These wetlands support yellow pond-lily, California pitcher-plant (*Darlingtonia*) and many species of sedges and rushes.

California pitcher-plant (*Darlingtonia californica*)

Coast Range Ecological Cells & Global Significance

The New River ACEC typifies two Coast Range Ecological Cells defined in the Oregon Natural Heritage Plan (Natural Heritage Advisory Council 2003). The contribution of these diverse vegetation habitats to the life requirements of plant and animal species, including special status plants and animals, is significant. The lacustrine cell is representative of a dune-blocked lake with aquatic beds and marshy shore, surrounded by unconsolidated sands. The palustrine cell is representative of the Labrador tea/sphagnum moss mire on organic soils with California pitcher plant, including associations with shore pine and western red cedar.

New River ACEC also has Coast Range Special Species for the Oregon Natural Heritage Plan. It contains dwarf brodiaea (*Brodiaea terrestris*), liverwort (*Calypogeia sphagnicola*), timwort (*Cicendia quadrangularis*), russet cotton-grass (*Eriophorum chamissonis*), western lily (*Lilum occidentale*), silvery phacelia (*Phacelia argentea*), and water clubrush (*Scirpus subterminalis*).

The Natural Heritage Program uses a prioritization system for determining global significance of plant communities. On a scale of 1 to 5, "global rankings" are based on the number, quality, and condition of the occurrences; the narrowness of range; the trends in populations and habitats; and the threats to and the fragility of the element being assessed. The global ranks are as follows:

- G1 – critically imperiled globally (typically 5 or fewer occurrences)
- G2 – imperiled globally (typically 6 to 20 occurrences)
- G3 – rare or uncommon but not imperiled (typically 21 to 100 occurrences)
- G4 – not rare and apparently secure, with numerous long-term occurrences (usually more than 100 occurrences)
- G5 – demonstrably widespread, abundant and secure

Two plant communities, found only along the North American Pacific Coast, are rare and declining at New River (Kagan et al. 2004). These communities have declined throughout their range for various reasons, including: the introduction of non-native plant species; agricultural, residential, and recreational developments; possible dewatering of coastal aquifers; and competition by encroaching conifers due to the suppression of natural fires.

The occurrence of these plant communities in areas such as New River is extremely important. They are afforded recognition, protection, and restoration as Areas of Critical Environmental Concern. The Coos Bay District Resource Management Plan calls for protection of special habitats on a case-by-case basis (BLM 1995).

The two globally ranked plant communities at the New River ACEC are:

- Unstabilized coastal dune wildrye (*Leymus mollis* ssp. *mollis – Lathyrus japonicus*) is a G1 plant community that is critically imperiled globally. This community was likely much larger historically at New River, but today only small, isolated patches are present. It has been out-competed and replaced by European beach grass.

- Bog blueberry and tufted hairgrass shrubswamp (*Vaccinium uliginosum – Deschampsia cespitosa*) is a G2 plant community that is imperiled globally. This community was probably never common or of large extent. It is presently being encroached by conifers and willows. Overtopping by these species may threaten this community's persistence.

Special Status Plant Species

Sixteen special status vascular plant species either occur or are suspected to occur within the boundaries of the New River ACEC. A species that is suspected to occur means that habitat is present or is known to be located on adjacent lands (Table 1, Oregon Natural Heritage Information Center 2004). Plants which have special status designation require habitat management. Six species are of special mention – one is listed as federally endangered while five are species of concern.

Pink sand-verbena

Pink sand-verbena (*Abronia umbellata* ssp. *breviflora*) is a federal species of concern, listed endangered by the State of Oregon, and Bureau sensitive. This annual herb historically occurred from British Columbia, Canada, to Marin County, California. It is believed to be extirpated from Washington. Two plants were observed in 2000 on Vancouver Island. Habitat for pink sand-verbena includes sandy beaches above the high tide line and possibly dunes further inland. The primary threats to pink sand-verbena are loss of habitat from the encroachment of European beach grass and disturbance from off-highway vehicles (OHVs). A population of this species has been created within the New River ACEC as part of recovery efforts. Sections of European beach grass between New River and the Pacific Ocean have been removed by mechanical means and prescribed fire. Since 1991, about 80,000 to 100,000 seeds have been spread annually in these cleared areas. The population has gradually increased in number and in 2003, 917 plants were documented.

Pink sand-verbena (*Abronia umbellata* ssp. *breviflora*)

Seaside cryptantha

Seaside cryptantha (*Cryptantha leiocarpa*) is a federal species of concern and is Bureau sensitive. This annual herb occurs on stabilized coastal dunes and prairies usually within 300 meters of the beach from Curry County, Oregon, to southern California. Little is known about its ecology or biology. The species is threatened by loss of habitat from encroachment of exotic species such as European beach grass, coastal development, and OHVs. One occurrence is currently known from with the ACEC.

Seaside gilia

Seaside gilia (*Gilia millefoliata*) is a federal species of concern and is Bureau sensitive. This annual herb occurs on stabilized coastal dunes and prairies usually within 300 meters of the beach from Curry County, Oregon, to central California. Little is known about its ecology or biology. This species is threatened by loss of habitat from encroachment of exotic species such as European beach grass, coastal development, and OHVs. One occurrence is currently known to exist within the ACEC.

Silvery phacelia

Silvery phacelia (*Phacelia argentea*) is a federal species of concern, listed threatened by the State of Oregon, and is Bureau sensitive. This perennial herb occurs on sandy beaches and coastal bluffs from Coos County, Oregon, to Del Norte County, California (where only four occurrences are known). This species is threatened by loss of habitat from European beach grass and disturbance from OHVs. Three occurrences are currently known to exist within the ACEC.

Western lily

Western Lily (*Lilium occidentale*)

Western lily (*Lilium occidentale*) is a federally endangered species and Bureau sensitive. In 1995, it was discovered at the New River ACEC. The region was identified as historically having the greatest concentration of western lily populations in Oregon (Ballantyne 1980). This perennial herb ranges from Coos County, Oregon to Humboldt County, California. It is almost always found on Blacklock type soils (soils with a cemented, clay hardpan) in habitats such as coastal bogs, prairies, and forest edges. Threats to this species include: loss of habitat from development (especially agricultural and residential), plant collection, plant succession, and grazing. Management activities, such as brush removal and fencing, can alleviate the latter two threats, but development, especially on private lands, cannot be controlled. That is why areas such as New River are vitally important in the protection of sensitive species. Since 1995, the BLM has been involved in a project with the Berry Botanic Garden to collect and store seed, propagate plants, and monitor an experimentally introduced population. In 1998, a recovery plan for this species was prepared (Guerrant et al. 1998). During 2003, two new populations of this species were documented. One population is located inside and one outside of the New River ACEC boundaries.

Wolf's evening-primrose

Wolf's evening-primrose (*Oenothera wolfii*) is a federal species of concern, listed threatened by the State of Oregon, and is Bureau sensitive. This biennial species is currently limited to very few remaining populations. It ranges from northern California to Port Orford, Oregon. Most populations contain only a few individuals and are vulnerable to a variety of biotic and abiotic threats. The species forms hybrids when it crosses with the red sepal evening-primrose, a widespread, exotic, ornamental species that has escaped from gardens. In 2004, refuge population of Wolf's evening-primrose was established at New River. New River is located 12 miles north of the farthest north naturally occurring population; however, the ACEC was chosen as a secure site where the species would likely not hybridize with the exotic species.

Wolf's evening-primrose (*Oenothera wolfii*)

Table 1. Special Status Vascular Plant Species Documented (D) or Suspected (S) at New River

Common Name (*Scientific Name*)	**D/S**	**Federal Status**	**ORNHIC List[1] and Oregon State Status**	**BLM Status**
Beach saltbush (*Atriplex leucophylla*)	D		List 3	Tracking Species
California pitcher-plant (*Darlingtonia californica*)	D		List 4	Tracking Species
Dwarf brodiaea (*Brodiaea terrestris*)	D		List 2	Assessment Species
Humped bladderwort (*Utricularia gibba*)	D		List 2	Assessment Species
Northern bog clubmoss (*Lycopodiella inundata*)	D		List 2	Assessment Species
Oregon timwort (*Cicendia quadrangularis*)	D		List 2	Assessment Species
Pink sand-verbena (*Abronia umbellata* ssp. *breviflora*)	D	Species of Concern	List 1, State Endangered	Bureau Sensitive
Russet cotton-grass (*Eriophorum chamissonis*)	D		List 2	Assessment Species
Seaside cryptantha (*Cryptantha leiocarpa*)	D	Species of Concern	List 1	Bureau Sensitive
Seaside gilia (*Gilia millefoliata*)	D	Species of Concern	List 1	Bureau Sensitive
Silvery phacelia (*Phacelia argentea*)	D	Species of Concern	List 1, State Threatened	Bureau Sensitive
Swaying bulrush (*Schoenoplectus subterminalis*)	D		List 2	Assessment Species
Western lily (*Lilium occidentale*)	D	Federal Endangered	List 1, State Endangered	Bureau Sensitive
Whorled marsh pennywort (*Hydrocotyle verticillata*)	S		List 2	Assessment Species
Wolf's evening-primrose (*Oenothera wolfii*)	D	Species of Concern	List 1	Bureau Sensitive
Yellow sand-verbena (*Abronia latifolia*)	D		List 4	Tracking Species

[1] **Oregon Natural Heritage Information Center (ORNHIC) status:** List 1 – threatened or endangered throughout range; List 2 – threatened or endangered in Oregon but stable elsewhere; List 3 – Review List, more information is needed before status can be determined; List 4 – Watch List, species of concern but not currently threatened or endangered.

Ten special status non-vascular (i.e., lichens, fungi, mosses, hornworts, and liverworts) plant species either occur or are suspected of occurring in the ACEC (Table 2, Oregon Natural Heritage Information Center 2004).

Table 2. Special Status Non-vascular Plant Species Documented (D) or Suspected (S) at New River

Scientific Name	**Group**	**D or S**	**ORNHIC List Status[1]**	**BLM Status**
Bryoria pseudocapillaris	Lichen	D	List 1	Bureau Sensitive
Bryoria spiralifera	Lichen	S	List 1	Bureau Sensitive
Calypogeia sphangnicola	Liverwort	S	List 2	Assessment Species
Erioderma sorediatum	Lichen	S	List 2	Assessment Species
Kurzia makinoana	Liverwort	D	List 2	Assessment Species
Leioderma sorediatum	Lichen	S	List 2	Assessment Species
Sulcaria badia	Lichen	S	List 2	Assessment Species
Teloschistes flavicans	Lichen	D	List 2	Assessment Species
Triquetrella californica	Moss	S	List 2	Assessment Species
Vermilacinia cephalota (*Niebla cephalota*)	Lichen	S	List 3	Tracking Species

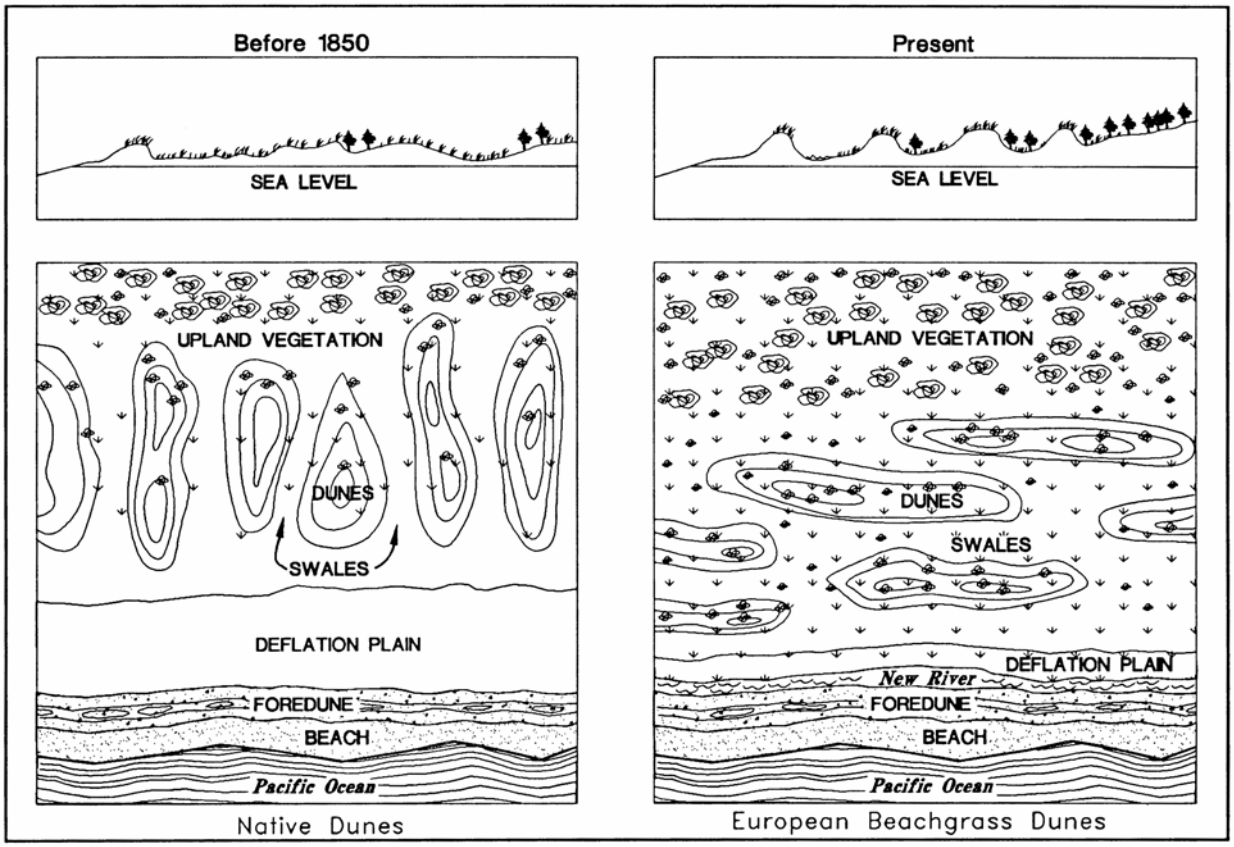
[1] **Oregon Natural Heritage Information Center (ORNHIC) status:** List 1 – threatened or endangered throughout range; List 2 – threatened or endangered in Oregon but stable elsewhere; List 3 – Review List, more information is needed before status can be determined; List 4 – Watch List, species of concern but not currently threatened or endangered.

Exotic & Noxious Plants

Over 70 exotic or non-native plant species occur at New River. Exotic plants are those that are not indigenous to a given area, occur as a result of introduction, or have escaped and become naturalized. These species did not occur here before the arrival of European culture. Some exotic species are pioneer plants that are normally limited to a single generation before a dense plant cover develops. Other exotic species, like European beach grass, colonize a habitat by vegetative reproduction, often crowding out native species. These species are referred to as invasive species.

Troublesome, invasive species at New River are found in both aquatic and terrestrial habitats. Brazilian waterweed and spiked water-milfoil are two aquatic exotic species that degrade the New River channel, especially during lower stream flows in the summer. These plants displace native vegetation, interfere with normal development of fish and wildlife habitat by the formation of impenetrable mats and decreased water flow, reduce light to other native aquatic vegetation and organisms, and may provide habitat for mosquitoes. They also reduce water quality and levels of dissolved oxygen. European beach grass, Scotch broom, and gorse are the three main terrestrial exotic species that degrade the lands surrounding New River.

Figure 3. Historic and Current Dune Configuration at New River



Local residents of the Bandon area, north of New River, report that the first appearance of European beach grass was during the 1920s when plants washed ashore (Hanneson 1962). Dormant rhizome fragments of this aggressive grass are able to disperse long distances because of their resistance to prolonged immersion in sea water. They can survive at least eight tidal cycles during marine transport (Baye 1990).

European beach grass now covers large expanses of the ACEC between the open sand beach and the river (foredune) and along some parts of the ACEC east of the river as an understory to the forest and woodland communities. European beach grass reduces the native plant richness by as much as half (Barbour and Johnson 1988). It has the ability to out compete native foredune plant species (Barbour et al. 1985) by altering the habitat (Van der Putten 1985 cf Pickart et al. 1990). Blowing sand is trapped, burying other species and precluding resource competition. Unlike other vegetation, European beach grass can withstand sand burial of up to one meter per year. In fact, sand burial promotes beach grass leaf elongation and underground stem development (Ranwell et al. 1959). Runners in the root system are the primary means of beach grass reproduction. Despite high seed production of up to 20,000 seeds per plant per year, most beach grass seedlings die within a few weeks of germination (Huiskes 1979).

Significant differences are seen when comparing areas dominated by European beach grass with those covered by native dune species, such as American dunegrass. Foredunes dominated by European beach grass are steep and give way to a series of dunes and swales parallel to the coast. In contrast, dunes

dominated by American dunegrass rise gradually and lead to dunes and swales perpendicular to the coast (Figure 3, Barbour and Johnson 1988).

Some exotic plant species are designated noxious weeds. These plants have been officially determined to be injurious to public health, agriculture, recreation, wildlife on any public or private property by the state's Noxious Weed Control Program (Oregon Department of Agriculture 2003). The nine noxious weeds at New River include: Scotch broom, common gorse, French broom, Himalayan blackberry (also referred to as Armenian blackberry), English ivy, Canadian thistle, bull thistle, tansy ragwort, and Brazilian waterweed. European beach grass, pampas grass, and silver wattle are not designated noxious at this time, but they also degrade natural plant communities and change wildlife habitats. These species and others may be officially determined to be noxious in future years.

Wildlife

This variety of plant communities described in the preceding section support an abundant wildlife resource. There are an estimated 230 bird (86 documented breeders), 50 mammal, 12 amphibian, and 15 reptile species documented or suspected to occur within the ACEC (Appendix D). The value of this diverse species composition, including special status species, was one of the major reasons for designating the area as an Area of Critical Environmental Concern.

Wildlife Habitat

Wildlife habitat contributes to an animal's life requirements, including: feeding, resting, and breeding. Noteworthy aspects of the habitat values at New River are:

- Coastal location
- Variety, types, and juxtaposition of habitats present
- Uniqueness of plant communities and habitats relative to the increasing amount of development along the Oregon coast
- Limited human use of the area

Five of the major wildlife habitat types at New River include:

Wetland and Riparian Areas

Seasonal and permanent wetlands located along New River are major feeding and resting areas for both resident and migrating wildlife. These wetlands are commonly used by ducks, perching birds, and beaver, and are important habitats for amphibians. Many wetland-dependant wildlife species provided a forage base for predators such as the Peregrine Falcon, Northern Harrier, bobcat, fox, raccoon, and snakes.

Riparian habitat is found along the banks of waterways. Many of these areas are dominated by grasses and sedges, while some are dense with willows. These areas also offer important feeding and nesting habitat for migrating songbirds, shorebirds, and wading birds, and provide the essential life needs for river otter and beaver. They offer hiding cover for some waterfowl and are vital freshwater source for most wildlife species in the area. Mudflats also exist along the margins on the river, especially during low-flow conditions, and are important feeding and resting areas for migratory shorebirds.

Meadows

Meadows near open water habitat, especially those that are fully exposed to the warmth of the sun may be used by nesting western pond turtles. Open meadows are frequented by black-tailed deer, particularly when new grasses emerge.

Sand Dunes and Beaches

In spite of having sparse vegetation, open sand dunes and beaches provide habitat for shorebirds, gulls, and marine mammals. Western Snowy Plovers, for example, nest in the open areas where shells, pebbles, and small debris collect.

Forests/Shrublands

Much of the forested and shrubland habitats within the ACEC are dominated by many species of woody vegetation, primarily shore pine, Sitka spruce, hairy manzanita, evergreen huckleberry, salal, and willows. These forested and shrubland habitats are used by birds for feeding, resting, and breeding. At least 86 bird species are known to nest within the ACEC. These habitats are also used by blacktail deer, porcupine, rabbits, woodrat, and opossum. Other likely inhabitants are the western fence lizard and the western terrestrial garter snake. There is a limited amount of coarse woody debris present in this habitat type that provides important cover for salamanders, rodents, and various invertebrate species.

Open Water

New River's open water habitats support several species of ducks and two subspecies of Canada Goose. Many of these waterfowl nest along the river banks and nearby lakes. Other species of waterfowl use the open waters to forage and rest during their spring and fall migrations. Some species that do not normally frequent the New River area may take refuge in the area during storms. River otter and seals use New River to feed on these fish and aquatic food sources. Western pond turtle, a special status species, have been documented in still water areas. Beaver are common, found mostly in the tributaries to New River, Floras Lake outlet, and the small lakes and other wetlands located on private and public lands.

Ocean and freshwater exchanges occur at low points where high tidal overwashing crosses the foredune. The effect of this action on wildlife populations is unknown, but it may improve feeding conditions for migrating populations.

New River's estuary extends from an area between the outlets of New Lake and Croft Lake to the mouth of the river. This estuarine effect often only occurs from mid-October to the end of July when the mouth of the river is open to ocean flow. A small tidal effect which is most dramatic from Fourmile Creek to the New River mouth provides various sized sand/mudflats for shorebird foraging. Some sand/mudflats are flooded by tides during the fall and spring and are critical feeding sites for large numbers of resident and migratory shorebirds.

Wildlife Species

Birds

Situated along the Pacific Flyway, New River is host to tens of thousands of shorebirds and waterfowl during spring and fall migration, making the area a critical stopover area for many species heading to wintering and breeding grounds. Of the 230 bird species documented or suspected to occur at New River, 86 have been documented, at least once, to breed in the area, and 19 have special species status designation (Table 3). The New River ACEC is designated an Important Bird Area by the American Bird Conservancy, because it is an essential place for protecting rare, declining, or migratory birds.

Mammals

There are 50 mammal species documented or suspected to occur within the New River ACEC. Seven have special status (Table 3). Four bat species are suspected to occur within the area since the ACEC is within their range. Others, such as the harbor seal and sea lions are regularly seen offshore and may occasionally leave their pups on the beach while foraging nearby. Gray whales can be seen on their annual migrations south to calving waters along the Baja Coast, then back to northern waters around Alaska.

Amphibians

Of the twelve amphibian species documented or suspected to occur at New River, four have special status (Table 3). The most common is the red-legged frog, occurring in wetlands throughout the ACEC. The clouded salamander is less common, but has been observed within the boundaries of the ACEC. Two other species, the tailed frog and the southern torrent salamander, have not been observed in the area although range maps indicate the ACEC is within their range.

Reptiles

Fifteen reptile species are documented or suspected to occur at New River. The Northwestern pond turtle has special status since it is listed as a Bureau tracking species. Four sea turtle species may occur on the ocean beach at New River, but due to their extremely infrequent use of the area they are not included in the discussion of special status species of the ACEC. The last evidence of sea turtle use was in 1991, when possible tracks were found on the ocean beach in the southern portion of New River.

Invertebrates

No baseline inventories have been conducted for invertebrates within the New River area.

Special Status Wildlife Species

There are 31 special status wildlife species that have either been documented or are suspected to occur within the New River ACEC (Table 3). This plan update includes twenty-two more special status wildlife species than the original management plan. The new list includes Bureau sensitive, assessment, and tracking species, whereas the original plan only included federal threatened, endangered, or candidate species under the Endangered Species Act. Since the original plan was completed, the special status designation has also changed for a variety of species. Especially noteworthy for New River is the Aleutian Canada Goose, which was de-listed and removed from the Endangered Species List in 2001. It is

now listed as a Bureau sensitive species by the BLM. Some of the more commonly seen special status species are addressed in greater detail below.

Aleutian Canada Goose

Aleutian Canada Goose is now listed as Bureau sensitive. In 2001, this species was removed from the Endangered Species List, because recovered population numbers far exceeded expectations outlined in the recovery plan. The main reasons for recovery of this species include hunting restrictions in key migration and wintering areas and predator management on off-shore islands where the goose breeds. Although this goose is not a local breeder at New River, numbers can reach up to 30,000 as they migrate through the area in spring (March 15 to May 1) and fall (October 15 to November 30). The New Lake outlet area is currently the only identified use area in the ACEC. Most of the resting and foraging activities of these geese occur on the wetlands and pastures of adjacent private lands. The New River area is the last place migrating Aleutian Canada Geese forage before beginning their long flight to the Aleutian Islands.

Aleutian Canada Goose (*Branta canadensis leucopareia*)

Bald Eagle

The Bald Eagle is federally listed as a threatened species. Currently there are no known active bald eagle nests within the New River ACEC, although an active nest is located on private land directly to the east. These eagles frequent the New River area, foraging along the river and often perching on large pieces of driftwood or in trees adjacent to the river corridor. Bald Eagle nests typically average a half a mile away from water in Oregon (USFWS 1986) and suitable habitat is present along this coastal zone. If it is

determined eagles are nesting within the area, management recommendations for limiting disturbance will be applied as per the 1986 Recovery Plan for the Pacific Bald Eagle.

Brown Pelican

Although the Brown Pelican isn't known to nest in Oregon, it is a common post-breeding visitor and is frequently seen foraging and resting in offshore waters as well as resting along the beach and river mouths of New River. During the 1960s and early 1970s, the only viable breeding Brown Pelican population remaining in the U.S. was found in Florida, prompting the government to list it as a federally endangered species. Massive failures at breeding colonies because of collapsed eggs caused by food contamination originating from DDT and other pollutants were determined the cause.

Northwestern Pond Turtle

Northwestern pond turtles, previously referred to as Western pond turtles, are listed as a Bureau tracking species. They are the only native freshwater turtle found in Southwest Oregon. The New River area provides good low-gradient river habitat and several wetlands and ponds for the turtle. They have been observed in the vicinity of Floras Creek outlet, Muddy Lake, New River at the mouth of Bono Ditch, and Lost Lake. They can be seen basking on logs above the waters surface.

Peregrine Falcon

Peregrine Falcons were de-listed from the Endangered Species List in 1999, because of population increases throughout its range. Currently they are listed as Bureau sensitive, and as a requirement of de-listing, agencies are monitoring productivity at known breeding sites throughout the State. Peregrine Falcons prey on other bird species such as Band-tailed Pigeons, gulls, waterfowl, and shorebirds. They typically nest on cliffs that are inaccessible to mammals and close to water. There are no known falcon eyries within the ACEC, although peregrines are frequently observed in the New River area year-round.

Red-legged Frog

Red-legged frogs are listed as a Bureau tracking species and are commonly found in wetland areas throughout the New River area. Breeding sites must have little to no water flow, last long enough for metamorphosis to occur, and contain sturdy underwater stems for egg attachment. These habitat requirements are found at Lost Lake, Muddy Lake, and other wet areas throughout the ACEC.

Red-legged frog (*Rana aurora aurora*)

Steller Sea Lion

The Steller sea lion is listed as federally threatened. It and all other marine mammals, such as harbor seals and gray whales, are protected under the Marine Mammal Protection Act of 1972. Stellar sea lions are often seen swimming, foraging, and basking just offshore. Because of the remoteness and lack of public access along isolated stretches of beach at New River, Steller sea lions may occasionally haul out and leave pups on shore when foraging nearby.

Western Snowy Plover

The Western Snowy Plover is a small shorebird occurring year-round at New River that uses the open sand habitats of the ocean shore and coastal dune ecosystem. These areas are critical to the survival of the plover because of their importance as breeding sites. Plovers nest from March to September and nest sites can be easily disturbed by animal predators and human activities. If a brood or nest is destroyed, breeding attempts may continue until a nest is successful or until the end of the breeding season. Plovers were listed as State threatened in 1975, and the Pacific Coast population was federally listed as threatened in 1993. Surveys conducted by the Oregon Department of Fish and Wildlife in 1978 documented twenty-two plovers along the beach from Bandon to Floras Lake in what is now Critical Habitat Unit OR-7. Since 1998, the BLM has restored 2.75 miles (approximately 160 acres) of coastal dune habitat along the foredune for nesting plovers by removing European beach grass. Plovers have consistently used this restored area each year. The best breeding year for the plover since population monitoring began in 1990 was noted in 2003. Along the Oregon Coast a total of 59 young fledged, with seven fledging from the habitat restoration area located on the sand dunes west of New River.

Currently, an estimated 1,900 Western Snowy Plovers breed along the west coast of the United States and at least another 1,900 along the west coast of Baja California. Declines in the breeding population have been specifically documented in Oregon and California. In Oregon, Western Snowy Plovers historically nested at 29 locations on the coast. In 1990, only six nesting colonies remained, representing a 79%

decline in active breeding sites. The loss of breeding sites is attributed to habitat loss and disturbance. Information from the 2003 breeding season estimated Oregon's coastal population at 99 to 102 adult snowy plovers (Castelein et al. 2003).

A detailed account of the taxonomy, ecology, and reproductive characteristics of the Western Snowy Plover can be found in the U.S. Fish and Wildlife Service's published Final Rule in the Federal Register (58 FR 12864) determining Threatened Status for the Pacific Coast Population of the Western Snowy Plover (USFWS 1993).

Western Snowy Plover (*Charadrius alexandrinus nivosus*)

Yuma Bat (Myotis)

The Yuma myotis, listed as a Bureau tracking species, is the only bat documented within the ACEC. Four other bat species are also suspected to occur here. Many of these bats are known to inhabit buildings, caves, bridges, and crevices.

Table 3. Special Status Wildlife Species Documented (D) or Suspected (S) at New River

Common Name (*Scientific Name*)	**Federal Status**	**D/S**	**Key Habitat/Presence**
Birds			
Aleutian Canada Goose (*Branta canadensis leucopareia*)	BS	D	Wetlands and pastures. Abundant migrant from mid-April to early May; up to 12,000 birds have staged off the rocks at Bandon and up to 30,000 have been seen feeding in the ranch land north of Floras Lake.
Bald Eagle (*Haliaeetus leucocephalus*)	T	D	Uncommon year-round resident. A pair breeds on private land a few miles outside the ACEC.
Band-tailed Pigeon (*Columba fasciata*)	BT	D	Migrant and possible breeding species.
Bank Swallow (*Riparia riparia*)	BT	D	Rare migrant not seen every year.
Black Oystercatcher (*Haematopus bachmani*)	BT	D	Uncommon migrant species.
Black Swift (*Cypseloides niger*)	BA	D	Rare but regular migrant along New River from mid-May through about mid-June.
Brown Pelican (*Pelecanus occidentalis*)	E	D	Coastal beaches, off-shore waters, river mouths. Disperses from CA to OR post breeding as early as May; southbound birds can still be seen as late as December some years.
Burrowing Owl (*Speotyto cunicularia hypugaea*)	BS	S	Rare migrant and possible over-wintering species with only one record in recent years.
Marbled Murrelet (*Brachyramphus marmoratus*)	T	D	Breeds further inland in old growth forests; heard occasionally flying back to sea around sunrise.
Olive-sided Flycatcher (*Contopus cooperi*)	BT	D	Uncommon and local breeding species; probably nests in the Muddy Lake area.
Oregon Vesper Sparrow (*Pooecetes gramineus affinis*)	BS	D	Coastal grasslands. Discovered singing along New River in 2000 and heard again in 2001 and 2002, probably breeding. Was not observed in 2003.
Peregrine Falcon (*Falco peregrinus*)	BS	D	Breeds offshore near Port Orford; seen irregularly at New River year-round. Probably most common during shorebird migration.
Pileated Woodpecker (*Dryocopus pileatus*)	BT	D	Snags, especially large ones, variety of seral stages. Uncommon breeding species and year-round resident.
Purple Martin (*Progne subis*)	BS	D	Snags in early-seral habitats. Heard once or twice each breeding season; probably breeding somewhere close to New River.
Streaked Horned Lark (*Eremophila alpestris strigata)*	FC	D	Rare fall migrant that could also over-winter irregularly.
Upland Sandpiper (*Bartramia longicauda*)	BS	D	One record of a migrating bird seen on the McKenzie Ranch.
Western Bluebird (*Sialia mexicana*)	BT	D	Snags in early-seral habitats. Rare migrant; nests in open areas on the Wahl Ranch adjacent to Cape Blanco where nest boxes have been provided.
Western Snowy Plover (*Charadrius alexandrinus nivosus*)	T	D	Coastal beaches, dunes, river mouths. A small breeding population exists in the open sand area on the foredune.

Common Name (*Scientific Name*)	**Federal Status**	**D/S**	**Key Habitat/Presence**
White-tailed Kite (*Elanus leucurus*)	BA	D	Pastures, open grasslands. Winters and possibly breeds in the New River area.
Mammals			
American marten (*Martes Americana*)	BT	D	Late-seral forests, logs, and snags.
Long-eared myotis (*Myotis evotis*)	BT	S	Snags, bark, rock crevices, caves, and buildings.
Long-legged myotis (*Myotis volans*)	BT	S	Snags, bark, caves, rock crevices, buildings, and bridges.
Silver-haired bat (*Lasionycteris noctivagans*)	BT	S	Snags, bark, caves, rock crevices, and buildings.
Steller sea lion (*Eumetopias jubatus*)	T	D	Off-shore coastal waters.
Townsend's big-eared bat (*Corynorhinus townsendii*)	BS	S	Caves, rock crevices, buildings, and bridges.
Yuma myotis (*Myotis yumanensis*)	BT	D	Caves, buildings, bridges, and cavities.
Amphibians			
Clouded salamander (*Aneides ferreus*)	BT	D	Late-seral forests; large, class-3 down logs and snags.
Red-legged frog (*Rana aurora aurora*)	BT	D	Ponds, marshes, slow-moving streams. Upland generalist during non-breeding.
Southern torrent salamander (*Rhyacotriton variegates*)	BT	S	Seeps and cold, clear, small streams.
Tailed frog (*Ascaphus truei*)	BT	S	Cold, clear streams and rivers.
Reptiles			
Northwestern pond turtle (*Clemmys marmorata marmorata*)	BS	D	Lakes, ponds, and slow moving rivers, and creeks.
Federal Status: E=Endangered, T=Threatened, FC=Federal Candidate, BS=Bureau Sensitive, BA=Bureau Assessment, BT=Bureau Tracking.			

Exotic Animals

Several exotic or non-native animals influence native wildlife populations in the New River area. This influence is usually negative, because of direct competition for food and other resources, as well as predation of young. Non-native red fox eat snowy plover eggs and chicks; bullfrogs and large mouth bass eat salamanders, juvenile waterfowl, western pond turtles, salmon, cutthroat trout, and other frogs. These three predators are found in and around most of New River's freshwater wetlands and lakes, including Muddy and Croft Lakes.

Native song birds and their young are prone to predation and nest destruction by many other native wildlife species. However, in addition to these risks, starlings and house sparrows, both introduced species, successfully complete with songbirds for nesting sites and food resources. Feral cats are present in the area and are known to significantly reduce resident and migratory songbird populations. Opossums

and feral cats take a heavy toll on ground-nesting birds such as the Western Snowy Plover, California Quail, and Killdeer.

Fisheries

The New River basin contains a diverse array of aquatic habitats and fish species (Table 4). New River and its tributary lakes and streams are home to at least five species of anadromous fish and several other freshwater and marine fish species. Although the majority of these species are native to the region, some including largemouth bass and rainbow trout were introduced to enhance recreational fishing and have negatively impacted native fish populations.

Just prior to the establishment of the New River system, the majority of smaller streams and lake outlets in the area drained directly into the Pacific Ocean. Based upon the relative small size of these drainages, it is not likely that there were large amounts of estuarine or freshwater lagoon habitats associated with them. The estimated combined total area of lagoon habitat provided by these individual drainages was less than 20 acres, based on aerial photo interpretation, not including distinct lake habitats.

With the development of New River, this situation has dramatically changed. Conservative estimates indicate that New River currently contains over 100 acres of freshwater lagoon habitat, not counting distinct lake habitats. This is a substantial increase in the amount of rearing habitat available for salmonids, and may represent a potentially substantial increase in the number of juvenile fish surviving to the smolt stage (time of ocean entrance). Recent studies have indicated that estuarine habitat plays a much more important role in juvenile salmonid survival than previously thought (Cederholm et al. 2000, Miller and Sadro 2003).

Special Status Fish Species

While there is a greater availability of aquatic habitat in the New River area, the status of some fish populations are of concern. In particular, coho salmon populations in the New River system are severely depressed from historic levels. Coho salmon within the Oregon Coast Evolutionarily Significant Unit (ESU) were federally listed as a threatened species in 1998, under the Endangered Species Act. This ESU includes all naturally spawned populations of coho salmon in Oregon coastal streams south of the Columbia River and north of Cape Blanco. Oregon Coast steelhead within this ESU are designated as a candidate species due to concerns over specific risk factors.

South Coast fall run stocks of Chinook, south of Bandon, and coho salmon from New River south to California are listed as state sensitive by the Oregon Department of Fish and Wildlife (ODFW 1992). State sensitive is defined as a species for which listing as threatened or endangered is pending if immediate conservation actions are not taken. Pacific lamprey, coastal cutthroat trout, and coastal steelhead are listed as vulnerable by ODFW. Vulnerable is defined as a species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring.

Chinook, sea-run cutthroat, and steelhead populations in the New River system may be in somewhat better condition than in other southern Oregon Coast systems. However, there is little scientific data available from the New River and Floras Creek system from which to base strong conclusions. The fact that several distinct, and formerly separate, 4th and 5th order drainages now enter the New River system further complicates the task of evaluating the health of individual fish populations.

Table 4. Fish Species Documented (D) or Suspected (S) in New River

Common Name (*Scientific Name*)	**D or S**	**Habitat[1]**	**Duration**
Bay pipefish (*Sygnathus leptorhynchus*)	D	E, M	Intermittent
Bluegill (*Lepomus macrochirus*)	S	Fl	All year
Brown bullhead (*Ameiurus nebulosus*)	S	Fl	All year
Chinook salmon (*Oncorhynchus tsawytscha*)	D	Fs, Fl, E, M	All year
Coho salmon[2] (*Oncorhynchus kisutch*)	D	Fs, Fl, E, M	All year
Cutthroat trout[3] (*Oncorhynchus clarkia*)	D	Fs, Fl, E, M	All year
Largemouth bass (*Micropterous salmoides*)	D	Fs, Fl	All year
Largescale sucker (*Catostomus macrocheilus*)	D	Fs, Fl	All year
Pacific lamprey (*Lampetra tridentate*)	D	Fs, Fl, E, M	All year
Prickly sculpin (*Cottus asper*)	D	Fs, Fl	All year
Rainbow trout (*Oncorhynchus mykiss*)	D	Fs, Fl	All year
Shiner perch (*Cymatogaster aggregate*)	D	E, M	Intermittent
Staghorn sculpin (*Leptocottus armatus*)	D	E, M	All year
Starry flounder (*Platichthys stellatus*)	D	E, M	All year
Steelhead trout[3] (*Oncorhynchus mykiss*)	D	Fs, Fl, E, M	All year
Threespine stickleback (*Gasterosteous aculeatus*)	D	E, Fl	All year
Western brook lamprey (*Lampetra richardsoni*)	D	Fs, Fl	All year

[1] Habitat: Fs – freshwater stream, Fl – freshwater lake, E – estuarine, M – marine
[2] Oregon Coast coho salmon are listed as Threatened under the Endangered Species Act.
[3] Cutthroat and steelhead trout within the Oregon Coast ESU are currently listed as Candidate species for Federal listing under the Endangered Species Act.

Fishing Use

Use of the New River area has generally been low and predominated by the local fishing public, due to its isolation and limited access. From 1985 to 1997, harvest of fall Chinook in Floras Creek and New River ranged from 54 to 177 fish caught. However, fishing use is expected to increase as the southern Oregon Coast becomes more populated and people become more aware of the New River fishery. Predicting how an increase in fishing may impact the salmon fishery over time is difficult due to constant environmental change and the lack of adequate scientific data in the New River basin.

Juvenile coho salmon, captured and released during monitoring on New River.

Fish Habitat

Spawning and rearing habitat for salmon has declined throughout the New River basin (ODFW 1989). Contributing factors include: the draining of wetlands; straightening of stream channels; removal of riparian vegetation and large woody material; increased sediment yields from timber harvesting activities along tributary streams; introduction of non-native fish species to freshwater lakes; introduction of exotic Brazilian waterweed and spiked water-milfoil; and low summer flows and high water temperatures brought on by periods of drought and/or agricultural water diversion.

Lake and stream features in the New River area provide salmon with rearing habitat including deep pools and off-channel areas in nursery streams, lakes, ponds, and open wetlands. These habitats are especially important in providing slow moving water and abundant cover for young fish to survive winter floods. Historically these habitats were more abundant; however, juvenile salmon continue to use such habitats, especially in New Lake, Croft Lake, and Floras Lake throughout the winter before continuing into New River for their seaward migration. The predominant use by salmonids is likely for migration and rearing purposes, not spawning, due to New River's sand substrate.

In the early spring (several weeks to months after emerging from the gravel) young Chinook salmon begin migrating down Floras Creek to New River. Chinook smolts (juvenile fish that have begun their physiological adaptation to saltwater) rear throughout New River and its estuary during the summer and enter the ocean between June and October. Although spawning habitat for Chinook salmon has been reduced in Floras Creek, the numbers of spawning Chinook have fluctuated widely over the years. Rearing habitat for juveniles has expanded as a result of the formation and expansion of New River.

From an aquatic habitat perspective, the New River system is currently considered to be of fair quality overall. During the winter months, the flooded wetlands and terraces of New River likely serve as prime

over-wintering habitat for juvenile coho salmon. During low-flow conditions, the nature of the aquatic habitat found along this linear river system changes fairly frequently. In some areas the habitat takes on the characteristics of a lentic or lake system; while in other areas the habitat is more representative of a lotic or moving stream system.

A deeper, more confined river channel would have a beneficial effect on rearing habitat by reducing summer high water temperatures that can be lethal for salmon and steelhead and by providing them with more refuge from predators. Breaching in the northern part of New River should improve this condition, flushing sediment out of the shallow portions of the river that have stranded juvenile salmonids when a southern breach occurred.

For more information about the New River fishery, see Appendix E, Fish Habitat Use and Life History.

Cultural Resources

New River has a rich and varied cultural history. Fifteen prehistoric sites have been discovered on or adjacent to the New River ACEC, and ethnographic records suggest other unrecorded sites are also present. Historic resources include the cranberry bogs and the remains of the Cox homestead southwest of New Lake.

Two distinct periods of Native American presence are represented at New River. The oldest dates from about 3,000 to 8,000 years ago, while the more recent occupation probably dates from 500 to 1850 A.D. Our knowledge of the prehistoric record is fragmentary, so the apparent gap from 3,000 to 1,450 years ago may be based on inadequate data rather than an accurate reflection of an absence of human use. None of the older sites have been scientifically excavated. The Strain Site, a late period occupation site near the outlet of Floras Lake, was excavated by the University of Oregon in 1959.

Early Period (6,000 to 1,000 B.C.)

The early sites are found in association with Blacklock Series soils, which underlie much of the New River area. This deposit contains a large amount of organic debris and charcoal, and probably supported a dense spruce forest at one time. Pollen studies at Garrison Lake to the south and Tahkenitch Lake to the north suggest that much of today’s coastal plain was a shallow estuary 5,000 years ago. Early sites probably border these ancient estuaries, as shown by the presence of these sites on almost all of the low ridges surrounding the New River basin.

Early sites at New River are characterized by the presence of large leaf-shaped and broad-stemmed projectile points that were probably used for hunting large game animals such as deer and elk. Large side-scrapers and edge-ground cobbles used to process hides also are found at these early sites.

Perhaps the most important early site is near the outlet of Croft Lake where numerous artifacts were found among the stumps of an ancient spruce forest. This site covers several acres, but only the outer edge eroding into New River is readily apparent. Jack Storm, a long-time area resident, bulldozed several spots between Muddy Lake and New River from 1950 to 1970 and uncovered a large number of broad-stemmed projectile points which he sold to local collectors.

Evidence found at New River includes fire-cracked rock, lithic debris (flakes and chips), broken jasper nodules, and unfinished and finished artifacts. These suggest that the area was probably used for salmon fishing, big game hunting, huckleberry picking, tool manufacturing, and shellfish gathering.

Some local collectors claim that before European beach grass stabilized the dunes lithic debris and projectile points were evident across most of the broad terraces bordering New River's east side from Fourmile Creek to Floras Lake. Today, these sites are covered with forests or shore pine, but surface disturbance may reveal their location.

Artistic representation of Native American life on New River. Artwork by Peggy O'Neal.

Qua-To-Mah and Lower Coquille (500 to 1850 A.D.)

During the last 1,500 years, the Gunther Tradition projectile point style became dominant at New River. Where earlier cultures, termed the Glade Tradition, had relied on thrusting spears and darts hurled with atlatls to kill big game, the Gunther Tradition people manufactured thin, barbed points. They relied on a broad spectrum of economic resources, with an emphasis on fish and shellfish. Other artifacts characteristic of this occupation include oval-shaped knives used to butcher fish, hopper mortar bases used to process plant products, and large quantities of fire-cracked rock from camp fires.

The Qua-To-Mah and Lower Coquille people probably occupied the New River drainage for most of this period. Descendants of the Quo-To-Mah today are members of the Confederated Tribes of Siletz Indians of Oregon, while descendants of the Lower Coquille Indians are members of the Coquille Indian Tribe. Well before New River formed, their villages were located near the outlets of Fourmile Creek, New Lake, and the lower end of Floras Creek. Shell middens (trash heaps) at these points developed from a native diet heavily reliant on mussels and other shellfish. These sites were quite visible and most have been destroyed by local collectors.

Hopper mortar base and pestle used by Native Americans to process seeds at New River.

Ethnographic records indicate that the Qua-To-Mah and Lower Coquille lived in semi-permanent villages on elevated terraces near the confluence of streams with the ocean. They traveled by canoe to reefs near Blacklock Point to collect shellfish when the ocean was calm. During the summer, camas and brodiaea bulbs were gathered in nearby meadows. Salmon were speared, netted, or taken in traps during fall migrations up the shallow streams that now feed New River. The men of the village fished and hunted along the marsh edges while the women collected seeds and berries from local plants.

The Strain Site, where both Native American and Euro-American artifacts were found, is indicative of the recent prehistoric period. The remains of five rectangular plank houses were found atop a low knoll near Floras Lake outlet. Artifacts found at the site indicate that village residents relied primarily upon deer and elk, with fish and shellfish of secondary importance. This contrasts with the focus of many sites from this time, which appear more oriented towards marine rather than terrestrial resources.

Perhaps the most important value of archaeological sites is what they reveal about ancient environments and the plants and animals found there. Area swamps must have been a rich food source to support so many prehistoric camps and villages. Hunting mammals (not generally considered to be of particular importance compared to fishing in typical younger coastal sites) received specialized emphasis at New River because of the availability of deer and elk along marsh edges. Closer examination of the faunal record would probably reveal the additional importance of waterfowl and shorebird hunting here.

Many of the prehistoric sites are extensive. Some cases are as large as two acres. Discussions with local collectors indicate that some of the sites are deep, well-stratified middens with features associated with long-term use.

Some of these sites may be eligible for the National Register of Historic Places. Subsurface testing will be needed to ascertain the level of significance. It may be desirable to nominate all the sites as a historic district.

Recent Period (1850 to Present)

The New River historic sites probably are not as significant as the prehistoric ones. All that remains of the Cox homestead is a concrete foundation, scattered metal and glass debris, and some ornamental plants. The cranberry bogs, built around 1915, may be the most significant of the historic resources. These are some of the oldest bogs in the area, and contain the Stankevich variety of cranberry, which was developed in the New River area by crossing wild and domesticated cranberry vines. As a unique rural historic landscape, these bogs may be eligible for the National Register of Historic Places.

The prehistoric sites in the ACEC are fairly well-protected at the present time, thanks to a cover of stabilized sand dunes and a dense forest of shore pine. Some of the sites along the shoreline are suffering from slight wind and wave erosion, but as the riparian vegetation along the river improves, this threat may diminish. At one time, collection of surface artifacts and subsurface digging in archaeological sites was a serious problem at New River. Today, this is not a problem, largely because the sites are obscured by surface vegetation and the dunes.

Native American Concerns

The aboriginal territory of two federally-recognized Indian Tribes encompasses the New River area. Both the Confederated Tribes of Siletz Indians and the Coquille Indian Tribe are interested in protecting cultural resources within the ACEC. The BLM and Coquille Indian Tribe have partnered together in projects aimed at developing a more complete understanding of the area's paleo-environmental and cultural history.

Recreation

Regional Recreation Trends

Outdoor Recreation Demand in the Region

Every five years, the Oregon Parks and Recreation Department conducts a statewide assessment of outdoor recreation demand, needs, and trends. The document that describes the results of this assessment is termed the Oregon Statewide Comprehensive Outdoor Recreation Plan (SCORP). The 2003-2007 Oregon SCORP offers the best understanding of outdoor recreation demand within the state on a region by region basis. The SCORP is the product of extensive phone and mail-in surveys of Oregon households as well as out-of-state residents from Washington, Idaho, and California.

The SCORP presents a number of insights that may have relevance to the management of outdoor recreation at New River. According to survey results, New River offers seven of the ten highest demand activities statewide. In rank order these are: (1) running/walking for exercise; (2) walking for pleasure; (3) bird watching; (4) nature/wildlife observation; (5) sightseeing; (9) bicycling; and (10) ocean beach activities. The SCORP also identifies recreation priorities for the state on a region by region basis. Within Region 4, the South Coast, one of the top three recreation management priorities is to conserve coastal areas and preserve coastal access for recreation.

Regional Significance of Recreation at New River

Outdoor recreation opportunities provided at New River have been featured in a wide variety of guidebooks and publications highlighting birding, hiking, kayaking, and general touring opportunities in the region. New River was also featured in the recently published Smithsonian guidebook, *Beyond the National Parks, a Recreation Guide to Public Lands in the West*.

Nature-based tourism is one of the fastest growing segments of the global tourism market. Not surprisingly, New River has been included in several regional nature-based tourism plans and programs including:

- The Oregon Coastal Environments Awareness Network (OCEAN) links New River with South Slough, Dean Creek, and the Oregon Dunes National Recreation Area as environmental learning destinations.
- The Curry County Sustainable Nature-Based Tourism Project produced a *Plan for a New Economic Sector of Nature-Based Tourism in Curry County*.
- The Coos Regional Trail Partnership, *2000 Trail Plan*.

All of these factors are having an affect on the overall number of visitors choosing to visit New River and the shifts in recreation activity preferences that have occurred at New River over the last ten years.

Recreation Management at New River

Visual Resource Management

While visual resources are not solely a recreation resource, they are a significant aspect of the overall physical setting that affects recreation opportunities and experiences. The Coos Bay District Resource Management Plan (RMP) identifies the visual resources at New River with a Visual Resource Management (VRM) classification of Class II on the river and the ocean shore, and Class III within the remaining ACEC interior. The objectives for managing these visual resources are:

- VRM Class II allows for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer.

- VRM Class III allows for moderate levels of change to the characteristic landscape and management activities that may attract attention but should not dominate the view of the casual observer.

- In both VRM Class II and III areas, changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.

Special Recreation Management Area

In 1989, the New River ACEC was identified as a Special Recreation Management Area (SRMA) (USDI BLM 1989), then later designated as such in the Coos Bay District RMP (1995). SRMA is defined as an area where a commitment has been made to provide specific recreation activity and experience opportunities. These areas usually require a high level of investment and/or management. This designation acknowledges BLM's commitment to provide specific recreation activities and experience opportunities at New River in a manner that is compatible with protecting the natural and cultural resource values of the ACEC.

Since 1995, BLM has developed a number of enhancements to support and manage recreation use at New River. This infrastructure includes:

- The Ellen Warring Learning Center
- Five miles of trails that includes a half-mile of wheel chair accessible trail, footbridges and boardwalks, and a wildlife viewing platform
- Boat launches, parking areas, and picnic tables
- Interpretive wayside exhibits
- Public restrooms

New River has been further identified by the BLM as a Watchable Wildlife site due to the ACEC's outstanding opportunities to view some of the over 230 bird species, 50 mammal species, 12 amphibian species, and 15 reptile species.

The Coos Bay District Resource Management Plan identifies several general recreation management objectives that are pertinent to visitor use management at New River. These are:

- Manage scenic, natural, and cultural resources to enhance visitor experience expectations and to satisfy public land users.

- Support locally-sponsored tourism initiatives and community economic strategies by providing recreation projects and programs that benefit both short- and long-term implementation.

- Manage off-highway vehicle (OHV) use on BLM-administered land to protect natural resources, provide visitor safety, and minimize conflicts among various users.

- Enhance recreation opportunities provided by existing and proposed Watchable Wildlife areas and National Backcountry Byways.

- Continue to provide non-motorized recreation opportunities and create additional opportunities where consistent with other management objectives.

Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) provides a conceptual framework for inventorying, planning, and managing the recreation resource and its use. It is based on the recognition that people differ in their needs and in the experiences they desire; and further, that different site conditions yield different recreation experiences. ROS is used to categorize the landscape into a range of recreation opportunity classes based on the physical, social, and managerial settings inherent in the landscape. The standard ROS framework includes six opportunity classes ranging from "primitive" at one end of the spectrum to "urban" at the other. Each ROS class provides a different type of recreation or visitor experience opportunity.

By applying ROS to a geographic area, recreation experience opportunities can be managed in ways that either maintain the current physical, social, and managerial settings, or alter them to provide a different type of recreation experience. In addition, ROS provides a means to clearly define the setting for which an area is being managed as well as a basis for monitoring so that management adjustments can be made to protect or preserve the setting if necessary.

ROS provides a useful tool for planning and managing visitor use at the New River ACEC. However, the ROS concept was originally developed for application to relatively large geographic spaces (e.g., national forests and wilderness areas). Accordingly, applying the standard ROS framework to New River presents a number of challenges due to the ACEC's relatively small size and narrow shape, management practices on adjacent private lands, and the diverse mix of state agency jurisdictions. Given these conditions, the standard ROS framework would likely yield recreation opportunity classes throughout the ACEC that are closer to the "urban" end of the spectrum. These classes would be inconsistent with the kind of recreation experiences supported at New River under the original ACEC management plan. For the purposes of this plan update, the standard ROS framework and process have been adapted to better suit BLM's management direction at New River.

The ROS standards developed to guide the management of different recreation settings are useful tools in arresting the potential for cumulative fragmentation of the ACEC over time. Therefore, managing New River under a more primitive opportunity classification would provide a framework for more consistent management between the BLM's recreation, natural, and cultural resource objectives. Several other factors that push the relatively small acreage at New River toward the more primitive end of the spectrum include:

- In some areas, dense coastal vegetation absorbs most of the sights and sounds of human activity within a short distance.

- Large tracts of rural private land on the east side of the ACEC block public access and thereby limit the sights and sounds of human activity which increases the perceived remoteness of BLM land. At the same time, management practices and uses on the adjacent private lands could also interfere with the opportunity to obtain a more "primitive" experience at some times and places.

- New River properties have been acquired by the BLM to maintain, enhance, and restore the ACEC to a high degree of naturalness which would be comparable to a semi-primitive non-motorized setting.

- The Coos Bay District RMP specifies that this area will be managed in a manner that protects the area's natural and cultural values as evidenced by its designation as an ACEC, classification as VRM Class II-III, designation as an area that limits use of OHVs, and recognition as an SRMA due to outstanding natural and scenic values.

Based on these factors, an informal inventory of the New River ACEC has resulted in two distinct ROS inventory classes – roaded natural and the semi-primitive non-motorized. These settings aid the BLM in the management of the ACEC by establishing a set of conceptual controls for guiding visitor use. The following describes the characteristics of each setting:

Roaded Natural

The areas of the ACEC that are managed in a manner consistent with a roaded natural setting include:

- General area surrounding the Storm Ranch administrative complex
- Roads, trailheads, and parking areas
- Wheelchair accessible trail to the Muddy Lake viewing platform (closed to motorized vehicles)
- Immediate vicinity of the main public access points at Floras Lake, Fourmile Creek, and Lost Lake

The characteristics common to this type of recreation setting are:

- Opportunity to get away from others, but with easy access
- Some self reliance in the use of outdoor equipment
- Feeling of independence and freedom with little challenge or risk
- Substantially modified environment (e.g., roads, landscaping, structures)
- Moderate evidence of other users on roads and trails
- Frequency of contact is moderate to high in developed sites
- Regimentation and controls obvious, but largely in harmony with the surrounding environment (e.g., gated roads, barriers, fences, regulatory signs)
- Conventional motorized access
- Maintain recreation sites and immediate foreground in a natural appearing state.

The management objectives for these roaded natural areas are intended to provide a setting that is natural appearing while providing easy access to recreation opportunities. These objectives include the following:

- Rustic facilities providing some comfort for the user as well as site protection
- Use native materials, but with more refinement in design (synthetic materials should not be evident)
- Moderate site modification for facilities that are compatible with the overall resource management objectives for the area
- Interpretation through simple wayside exhibits (use native-like materials with some refinement in design) with some interpretation by agency staff
- Access for people with disabilities is of only moderate challenge

Semi-Primitive Non-Motorized

A majority of the ACEC is managed as a semi-primitive non-motorized setting. This setting includes all areas of the ACEC not designated as roaded natural. The characteristics common to this type of recreation setting are:

- Higher probability of experiencing solitude, closeness to nature, tranquility, self reliance, challenge and risk
- Area is characterized by a predominantly unmodified natural environment
- Low interaction between users and some evidence of other users
- On site controls and restrictions may be present, but are subtle
- Access and travel is on non-motorized trails, some cross country travel

The management objectives for these non-motorized semi-primitive areas throughout the ACEC are intended to provide a setting with a high degree of naturalness while preserving an outdoor recreation opportunity that emphasizes self reliance, challenge, and solitude. These objectives include the following:

- Facilities are provided for the protection of resource values and the safety of users only; no evidence of synthetic materials, use of undimensioned native materials only
- Interpretation exists through self discovery; some use of maps, brochures, and guidebooks; no on-site facilities
- Access for people with disabilities is difficult and challenging
- Spacing of groups may be formalized to disperse use and limit contacts between groups

Recreation Use at New River

Historically, most of the lands along New River were in private ownership and general public recreational use was limited. Recreation centered on consumptive uses such as fishing and hunting, and most of the users were local residents who knew the private landowners and had permission for access. When BLM lands in the area were designated an ACEC in the late 1980s and general public access became available in the 1990s, this recreational use pattern began to change.

There are now six general public use areas in the New River ACEC and non-motorized, low-impact recreational activities are becoming more popular in these areas. Two of these areas, Storm Ranch and Floras Lake, receive moderate to high levels of use, while the other sites have less visitation. The following describes the recreational setting and use patterns at Storm Ranch, Floras Lake, Fourmile Creek, Lost Lake, and dispersed recreational use along New River and the ocean beach:

Storm Ranch

Past Recreation Use under Private Ownership

When Jack and Ruth Storm owned Storm Ranch (1939-1977) they generated a portion of their income from recreation. They allowed visitors onto their land for a day-use fee of $1.00 per vehicle in the 1950s and 1960s and $2.00 per vehicle in the 1970s. Long-time residents report that the fishing was so good that it was not uncommon to see dozens of anglers catching fish each day. Storm Ranch was locally famous for its fishing of coho and Chinook salmon, sea-run cutthroat trout, and surfperch (also called pink-tail or pink-fin perch). Some camping did occur at Storm Ranch during fishing season. Local people as well as out-of-towners were provided camping areas with picnic tables for a nominal fee.

To maintain the fishery, Jack Storm breached the foredune every fall at or near the present day boat launch. The old breach sites are still evident today where the ocean occasionally overwashes to the river during periods of high surf. The clay shelf bordering the river on the east side allowed deep holes to form where the salmon would hide. Mr. Storm monitored the fishery daily and occasionally shot seals which were attracted to the rich food source.

Waterfowl hunting was another recreational use, but minor compared to the fishing interest. Hunting occurred south of the Croft Lake outlet; and during the 1950s and 1960s, a duck hunting club was formed near New Lake. Jack Storm did not encourage any hunting on his property, but did not mind those who hunted along New River south of Croft Lake outlet.

Another popular recreational use was glass float hunting. Glass floats from Japanese fishing vessels would wash ashore near Storm Ranch. Glass float hunters paid their day-use fee to Jack Storm and boated across to the foredune, which was then much flatter and narrower than it is today.

It is estimated that approximately 3,000 visitors came to New River each year during the time the Storms owned the ranch. In 1977, the ranch was sold and over the next 14 years it passed through two different ownerships: the Allens and the Wilsons. During this time, access to New River through the ranch was limited and resulted in reduced recreational opportunities for the public.

Original Storm Ranch House

Present Recreation Use under BLM Ownership

When BLM acquired the ranch in 1991, visitor use returned to a similar level as when owned by the Storms. Fishing interest continues to be high among local residents, although the fishery has degraded somewhat due to increased sedimentation and shallowing of the river in the Storm Ranch vicinity. Other recreational uses have become more popular, including: picnicking, canoeing and kayaking, hiking, bird watching, nature photography, horseback riding, bicycling, and general sightseeing. Joggers are sometimes seen using the trails as well.

In addition to providing low-impact recreational opportunities, the Ellen Warring Learning Center was constructed at the Storm Ranch portion of the ACEC to provide a focal point for interpretation and educational activities for the public.

In May 2003, a directional sign to the Storm Ranch portion of the ACEC was installed on Highway 101, which has resulted in a moderate increase in recreational activities. In 2003-2004, the site averaged about 10 visitors per day during the winter and spring, and 25 visitors per day during the summer and fall. During the fishing season in late fall, visitation can peak at around 40 persons in a day. Currently, approximately 5,000 people visit Storm Ranch each year. For more information about recent visitor-use trends by specific recreational activities at Storm Ranch, see the graphs located in Appendix H.

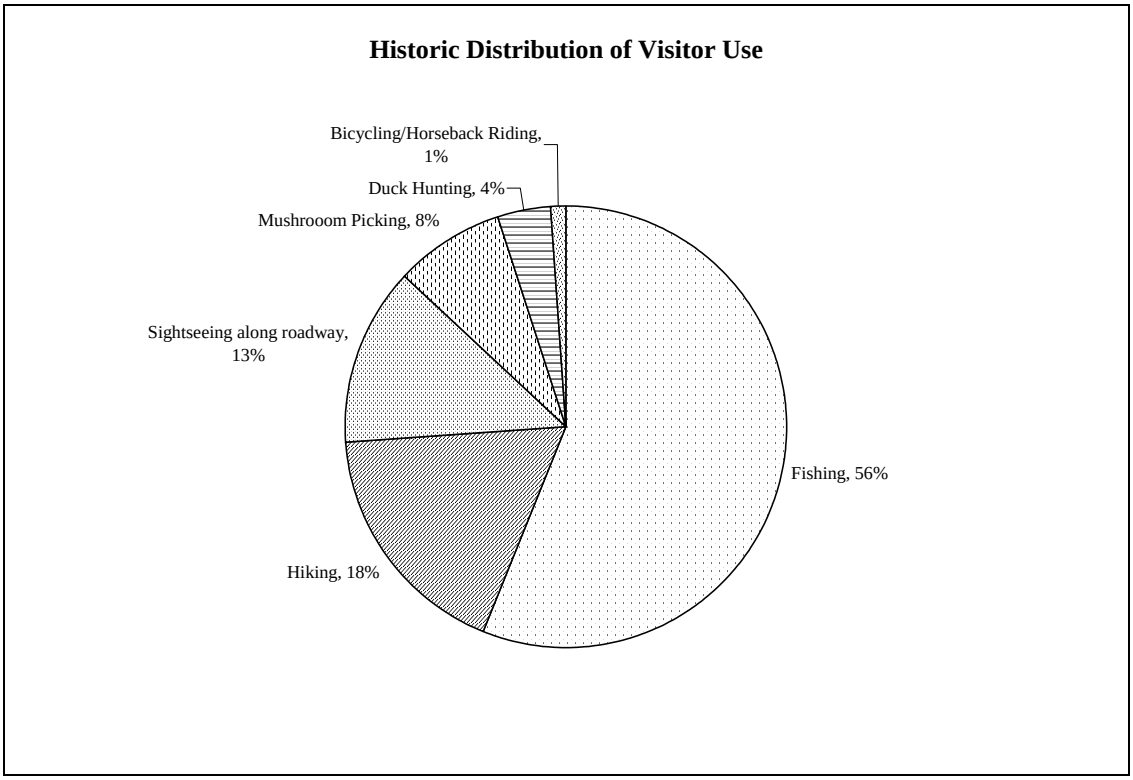
Figure 4 shows how recreation use at the Storm Ranch portion of New River has shifted over the years from more consumptive uses to lower impact activities. Historic visitor use data is based on monitoring results during the 1991-1992 seasons when the ranch was first acquired by the BLM. Current visitor-use data is based on BLM monitoring results during the 2001-2004 seasons.

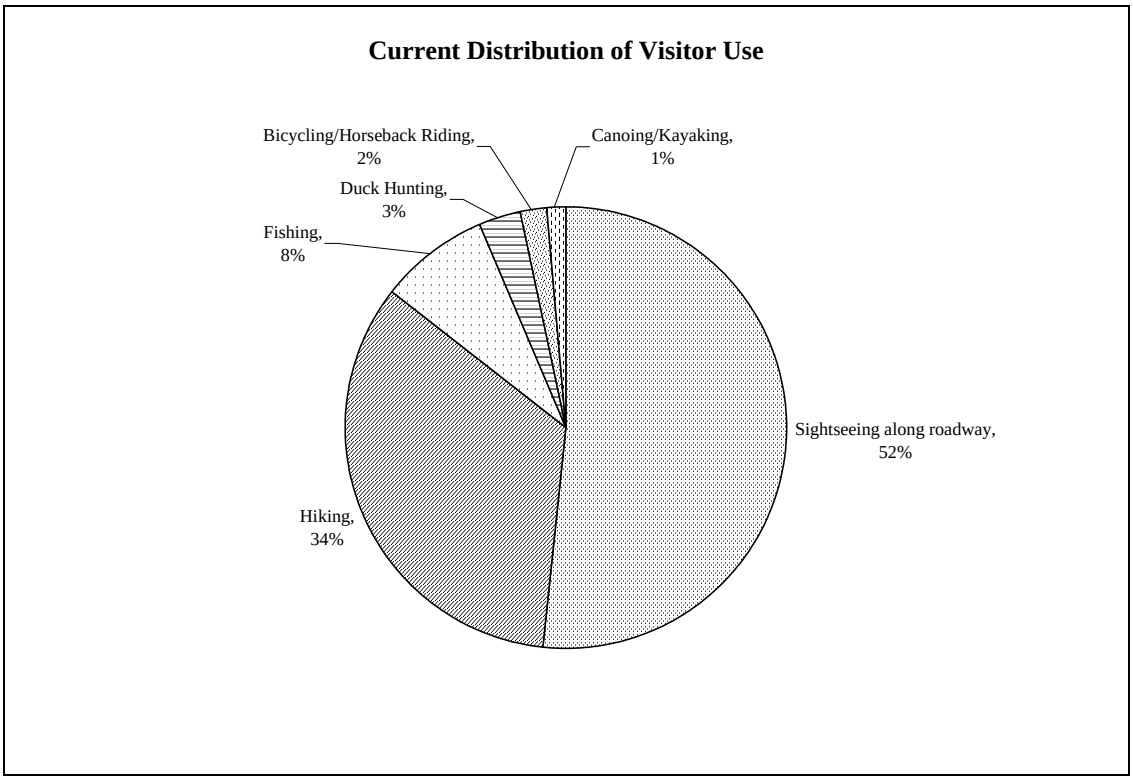
The historic level of fishing use may be lower than Figure 4a depicts, since many fishermen visit the river several times to observe the conditions before they actually decide to fish. BLM currently groups this type of user with ‘sightseers,’ whereas they may not have been grouped this way in the past.

Mushroom picking is not included in Figure 4b, since it is now an illegal activity due to resource concerns. (Collection of special forest products west of Highway 101 is not permitted on any lands managed by the BLM.) Canoeing and kayaking was not included in Figure 4a, since it has only recently become more popular.

Ellen Warring Learning Center, designed similarly to the original Storm Ranch house.

Figure 4a and 4b. Changes in Recreational Use at Storm Ranch





Floras Lake

The BLM land on the west and north sides of Floras Lake offers many of the same recreational opportunities as Storm Ranch. In addition, windsurfers and kite-surfers launch from the lake and occasionally the ocean shore. Since the replacement of the old footbridge across the lake outlet in 2001 visitor use has averaged approximately 30 people per day during the summer and about 12 people per day during the winter. In 2003, the Floras Lake portion of the ACEC averaged about 7,000 visitors.

Floras Lake, looking north towards New River.

Fourmile Creek

Another public access point to the ACEC is located at Lower Fourmile Road. From a small gravel parking area, a semi-primitive trail crosses a seasonally wet meadow where visitors can proceed on foot to New River. This short hike provides an opportunity to portage a canoe or kayak to the river. Private property surrounds this small, isolated parcel, and visitors are asked to respect the privacy of the residents. Visitor use data is not currently available for this area, but it appears the site is only occasionally used by local residents. There are no signs directing the general public to this site from Highway 101.

Lost Lake

The northernmost public access point to the ACEC is located at Lost Lake. This area can be reached via McTimmons Road to Woods Way. A foot trail begins at a parking lot on the east side of the lake. The trail borders the southern edge of the lake and leads to a series of large sand dunes. Traversing the dunes will lead visitors to New River. The Lost Lake portion of the ACEC is bordered to the west by Bandon

State Park and Coos County land. All other lands surrounding Lost Lake are privately owned. Visitors are asked to respect the privacy of these residents. Visitor use data is not currently available for this area, but it appear the site is only occasionally used by local residents. There are no signs directing the general public to this site from Highway 101.

Lost Lake

New River

A 1987 Oregon State Parks and Recreation Department study, *The Recreational Values on Oregon Rivers*, identified New River as having outstanding values for river recreation purposes, primarily due to its excellent fishery. The BLM evaluated New River in 1990 and found it to be eligible for inclusion in the National Wild & Scenic Rivers System as a Scenic River. The BLM based this eligibility finding on the river's free flowing condition, as well as its remarkable scenic and ecological values. However, New River was found not to be suitable for designation as a Scenic River in the Coos Bay District RMP, because not enough river shoreline was in federal ownership (approximately 40%). Since then, the amount of river shoreline in federal ownership has increased to 60% through land acquisitions, making it possible for future inclusion into the National Wild & Scenic Rivers System under current BLM policy.

Non-motorized boating on New River is increasing in popularity. Boating, especially canoeing and kayaking, affords an excellent recreational experience, but it can be challenging due to unpredictable winds and the constant fluctuation in water levels. Even boaters using electric motors are wise to take a fully-charged battery due to frequent strong winds. The public can access the river from Floras Lake outlet, Storm Ranch, and Lower Fourmile Road. In 2003, approximately 100 kayakers and canoers accessed New River from the Storm Ranch boat launch.

Spring and early summer are the best times to boat on New River, although some level of use is present all year. Even during the middle of winter, a break in the weather can provide an excellent opportunity to float the river during higher flow conditions. In the summer, the water level drops considerably and strong north winds make boating more challenging. Because of concerns for nesting Western Snowy Plovers

from March 15 through September 15, boaters are asked not to disembark on the west side of the river due to the adjacent dry-sand restricted areas on the foredune. These nesting areas are closed to visitors during this time.

Kayaking on New River during a rare calm day.

Ocean Shore

The ocean shore along New River is considered to be one of the most remote stretches of beach in all of Oregon. BLM land within the ACEC includes the dry sand portion of the beach above the mean high tide line. The state-owned beach zone includes the wet sand portion of the beach below mean high tide.

The 22-mile segment of beach between Cape Blanco State Park and Bandon has been designated by the state as part of the Oregon Coast Trail (also known as the proposed Jedediah Smith National Historic Trail). The New River segment of the trail is unmaintained and consists only of the beach below the high tide line. In total, this 360-mile-long trail runs from California to Washington, linking together the state's numerous coastal parks and public lands.

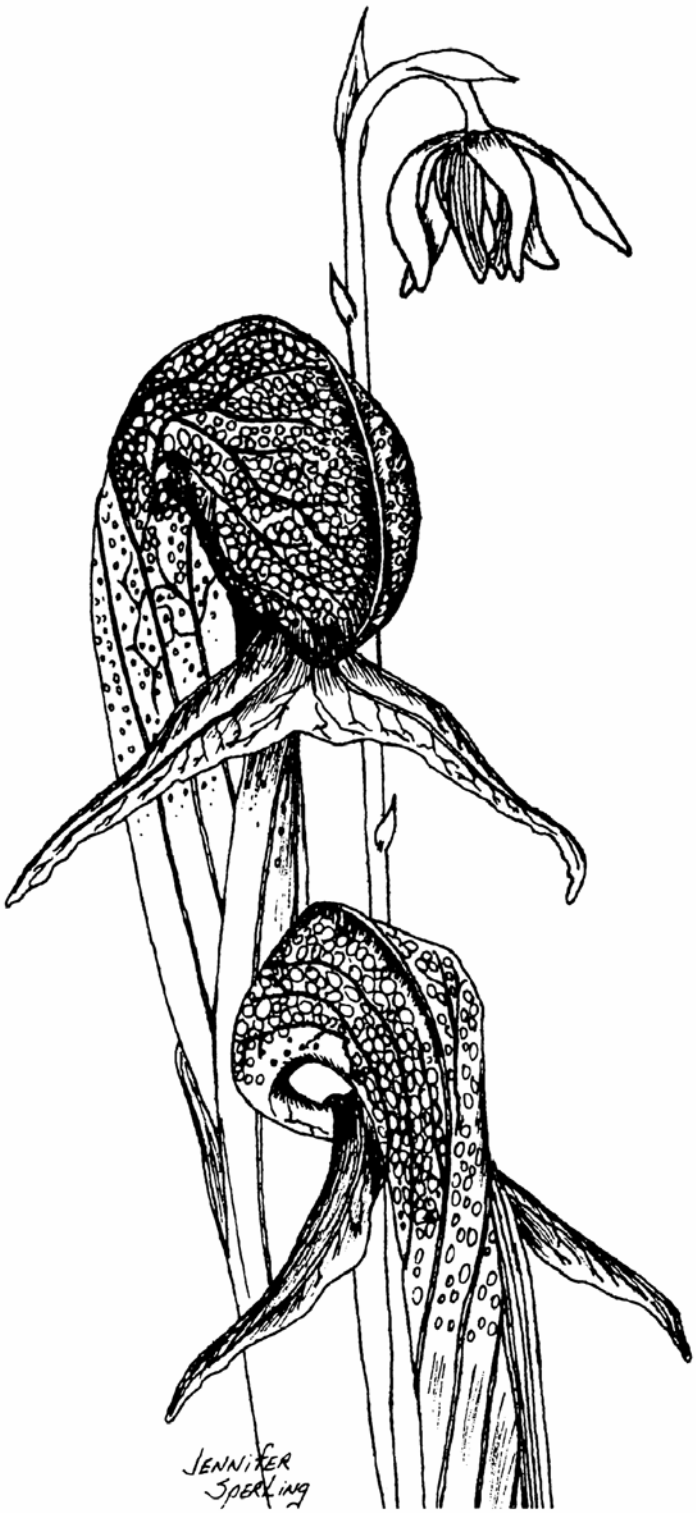
Most backpackers hike the New River section of the Oregon Coast Trail during the summer, when stream crossings are easier. Strong north winds during the summer encourage hikers to travel south. Seven miles of this trail borders the New River ACEC where special rules apply and a recreation permit is required for backcountry camping under special circumstances. During the summer of 2003, only 20 backpackers were observed hiking the beach along New River during routine monitoring of the area.

Although only seven miles of this 22-mile segment of the trail are adjacent to the ACEC, they are within the central portion of hike. Because of the long distance, some backpackers are unable to complete this segment of the trail in one day and have been observed camping in portions of the ACEC closed during

the Western Snowy Plover nesting season. The ocean shore adjacent to New River is open year-round; however, from March 15 through September 15, beach restrictions above the mean high tide line are enforced to protect breeding plovers. BLM requires that visitors avoid these designated dry-sand portions of the beach. The entire beach west of New River on federal, state, county, and private land is closed to OHVs year-round.

Ocean shore along New River.

PART THREE
THE MANAGEMENT PROGRAM



PART 3 – THE MANAGEMENT PROGRAM

Introduction

The foremost theme of the management plan is to conserve the designated values of the New River ACEC for generations to come. The backbone of the plan is its goals and objectives, which together establish the management direction and set forth specific resource values to be addressed. Also important is BLM's commitment to adaptive management of the New River area in order to more effectively achieve the goals and objectives of the ACEC.

The plan update includes a re-organization of the original plan's objectives to improve clarity of the management direction and readability of the document. The update includes two new objectives that have been separated out of the original eight objectives. They include: Objective 9: Cooperative Management, which was separated out from Objective 6: Site Administration and Development; and Objective 10: The Land Acquisition Strategy, which was separated out from Objective 1: Wildlife and Plant Resources. Another re-organization of the original objectives includes separating out project-specific monitoring actions from Objective 8: Monitoring and Research, and incorporating them in with their associated objective.

Goals and objectives are listed below, followed by details of each objective, including: reasons for action, planned actions, and actions accomplished or on-going. Planned actions are designed to be consistent with the management plan's goals and also to help meet one or more of the other objectives. "Actions Accomplished or On-going" is a new section for each objective that shows actions which have been addressed since the original management plan was finalized. Due to the interrelationship of the various resources at New River, many actions apply to more than one objective. These actions have been listed under the objective where the association is most direct to avoid duplication throughout the document. Any additional actions identified at a later date will be evaluated to ensure their appropriateness and compliance with the goals and objectives set forth in this management plan.

Management Goals

Goal 1 – Manage habitat for biodiversity (i.e., a full range of native species, habitats, and ecological processes) and ecosystem health with special emphasis on sensitive wildlife and botanical species.

Goal 2 – Protect significant cultural resources from human disturbance or destruction.

Goal 3 – Manage for recreational activities that are compatible with protecting cultural resources and managing habitat for biodiversity and ecosystem health.

Goal 4 – Use environmental education and interpretation as a tool to manage visitor impacts and to broaden the appreciation and stewardship of the New River ACEC.

Management Objectives

Objective 1 – Maintain, enhance, or restore ecosystem health, and ensure management supports a variety of habitats at different successional levels, particularly, but not limited to, those which are necessary for special status species using the area.

Objective 2 – Establish suitable water flow and quality, and maintain areas in a condition supportive of a healthy aquatic ecosystem.

Objective 3 – Protect and interpret important cultural resources at New River.

Objective 4 – Accommodate low-impact recreational use at New River while providing a variety of experience opportunities to help meet existing and anticipated demands.

Objective 5 – Promote awareness and appreciation for New River's many resource values, especially those significant to its ACEC designation; also foster a "Leave No Trace" / "Minimum Impact" land use ethic and similar attitudes in visitors at New River.

Objective 6 – Provide adequate use supervision, visitor facilities, services, signing, and programs to protect resources and support planned visitor use activities and levels.

Objective 7 – Provide reasonable access to visitor use areas and the river with minimal impact on natural and cultural resources and visitor experiences.

Objective 8 – Facilitate improved management of the New River area through monitoring and research to learn more about the natural and cultural resources of the area.

Objective 9 – Facilitate cooperative management of the New River area to better protect resource values through coordination and collaboration with others.

Objective 10 – Develop an effective acquisition strategy in collaboration with willing landowners to improve overall protection and public benefit of the New River area.

Plant and Wildlife Resources

Objective 1 – Maintain, enhance, or restore ecosystem health, and ensure management supports a variety of habitats at different successional levels, particularly, but not limited to, those which are necessary for special status species using the area.

Reasons for Action

- The BLM is required to follow federal laws and regulations and has established a policy to prevent the need to list fish, wildlife, and plants under the Endangered Species Act. Furthermore, the BLM is directed to encourage management which will lead to the successful recovery and eventual delisting of species already on the Endangered Species List.

- Over the years, alterations to the habitat have interfered with natural community succession. For example, forested areas were cleared to create pastures, shore pines were planted for windbreaks, fires were suppressed, and natural wetlands were converted to cranberry bogs.

- Exotic (non-native) vegetation, such as European beach grass, and noxious weeds, such as gorse, Scotch broom, and Brazilian waterweed, are replacing native vegetation and opportunistically becoming established on sites otherwise unoccupied by grass or shrub species. For example, gorse and Scotch broom are shrubs which have become established in grassland habitats devoid of any native shrub species. This spread of exotic and noxious vegetation is altering habitats and interfering with natural succession.

- Resource and vegetative management is necessary to maintain the natural communities, successional processes, and ecosystem health.

- Historic nesting areas of the Western Snowy Plover, a federally threatened species, have been altered by the introduction of European beach grass, increased predator populations and pressures, and increased human access and activity on beaches.

- Some wetland habitats need maintenance or restoration to support waterfowl and shorebird populations which, in turn, provide a prey base for Bald Eagles and Peregrine Falcons.

- Human activities may disturb plant and wildlife resources. Management actions need to have a balanced approach to ensure protection and limit disturbance to plant and wildlife resources.

Planned Actions

General Botany

- Coordinate with other agencies and private landowners to restore degraded and disturbed plant communities.

Special Status Plant Species

- Monitor and assess success of reintroduced populations of the pink sand-verbena and western lily, two special status species.

- Develop opportunities for collaborative habitat management on public and private land to increase the amount of habitat suitable for rare species and to link isolated populations with one another.

- Collect special status plant seeds as necessary for storage at the Berry Botanic Garden's Cryogenic Seed Bank.

- Conduct inventory of the vascular and non-vascular flora on a periodic basis, perhaps once every five years, to document changes to native and exotic species.

Pink sand-verbena

- Facilitate recovery of this species by determining its recovery needs and, if appropriate, introduce and establish a population on the foredune where habitat is present, possibly by spreading seeds.

- Coordinate pink sand-verbena conservation activities with management of Western Snowy Plover and implement beach and dune ecosystem restoration for multiple species.

Seaside cryptantha

- Maintain existing populations and habitat at existing levels. Depending upon funding and staffing, conduct monitoring of population status and trends, study the reproductive ecology of the species, and establish additional populations in areas that would not impact other management activities.

Seaside gilia

- Maintain existing populations and habitat at existing levels. Depending upon funding and staffing, conduct monitoring of population status and trends, study the reproductive ecology of the species, and establish additional populations in areas that would not impact other management activities.

Silvery phacelia

- Maintain populations and habitat at existing levels. Depending upon funding and staffing, conduct monitoring of population status and trends, study the reproductive ecology of the species, and establish additional populations in appropriate areas (e.g., away from established recreation trails).

Western lily

- Implement on- and off-site conservation measures and public outreach activities described in the final recovery plan for the western lily, finalized by U.S. Fish and Wildlife Service (Gurerrant et al. 1998).

Wolf's evening-primrose

- Support a project to study introduction of the species for recruitment, seed production, and the ability to develop a self-sustaining population through cultivation and field introduction techniques. These actions are integral to recovery of the species and may reduce the potential for federal listing of the species.

Bureau Assessment and Tracking Plant Species

- Within the vascular and nonvascular plants, several Bureau assessment species and Bureau tracking species are present at New River (Tables 1 and 2). Maintain existing populations and habitats at existing levels.

- Conduct monitoring of population status and trends, study the reproductive ecology of the species, threats, habitat changes, and effects of management treatments and practices either visually or quantitatively, on a yearly basis. Establish additional populations as warranted.

Globally Ranked Plant Communities

- There are two globally ranked plant communities at New River: the American dunegrass and the bog blueberry/tufted hairgrass communities. Maintain existing communities at current levels. Conduct restoration activities and monitor the status and trends of the communities. Restore these communities

by removing encroaching conifers and shrubs using either mechanical means or reintroduction of fire as appropriate.

Exotic Plants and Noxious Weeds

- Remove exotic plants and noxious weeds, such as European beach grass, gorse, Scotch broom, and Brazilian waterweed using integrated pest management practices, such as fire, mechanical or manual removal, and herbicide application. Restore damaged plant communities by spreading native seed and planting native plants.

- Use best management practices to prevent the further spread of exotic plants and noxious weeds.

- Monitor exotic and noxious weed species to document existing population areas, effectiveness of management actions for removal, and the spread of these species to new sites.

General Wildlife

- Complete inventories of wildlife species and their habitats.

- Provide protection to wildlife by promoting management actions that fully consider habitat requirements for birds, reptiles, amphibians, mammals, and invertebrates. Determine what management practices are needed for the long-term protection of those habitats.

- To minimize habitat fragmentation and disturbance to wildlife, manage all undeveloped areas of the ACEC for ecosystem health and biodiversity.

- Document the success of habitat restoration projects and/or other management actions.

Special Status Wildlife Species

- Coordinate with USFWS to implement recovery plans to protect threatened or endangered species.

- Monitor Aleutian Canada Goose, Western Snowy Plover, Bald Eagle, Peregrine Falcon, and other special status species through a consistent annual monitoring program. Track the effect of management actions and visitor use on wildlife habitats and behaviors.

Aleutian Canada Goose

- Protect habitat values and minimize harassment in known goose activity areas during peak migratory periods (approximately from March 15 to May 1 and October 15 to November 30).

- Encourage adjacent private ranchers to provide foraging and resting areas during peak migratory periods through cooperative agreements, conservation easements, or other incentives. Collaborate with USFWS on such programs.

Bald Eagle

- Inventory and assess the value of existing perches and potential nesting sites. Where needed, improve Bald Eagle habitat, consistent with Bald Eagle Recovery Plan objectives and Coos Bay Resource

Management Plan objectives, by creating naturalistic nesting and perch sites from existing trees within a half-mile of water sources.

- If hunting is found to have a detrimental effect on the Bald Eagle, BLM may petition ODFW for additional hunting closures as suggested in the USFWS recovery plan.

- If it is determined Bald Eagles are nesting within the ACEC, management recommendations for limiting disturbance will be applied as per the 1986 Recovery Plan for the Pacific Bald Eagle.

- Protect Bald Eagle wintering areas from disturbance from approximately November 15 to March 15.

- Encourage nearby private landowners to assist in improving bald eagle habitat by providing perching and nesting sites on their lands through cooperative agreements.

- Provide optimum natural foraging opportunities for Bald Eagles by supporting healthy fish and waterfowl habitat and populations.

Brown Pelican

- Determine the habitat use of the Brown Pelican in the New River area.

Peregrine Falcon

- Maintain or enhance Peregrine Falcon habitat consistent with the American Peregrine Falcon Recovery Plan.

- Determine Peregrine Falcon winter use areas through inventories. Develop management strategies that will minimize disturbance (October 1 through March 31) of key areas and retain natural structures (trees) used by Peregrine Falcons.

- If hunting is found to have a detrimental effect on Peregrine Falcons, BLM may implement the recovery plan options and petition ODFW for additional hunting closure within the ACEC.

- Manage and monitor natural Peregrine Falcon perch sites. Management may include, but not limited to, creating/manipulating perches, enhancing waterfowl and shorebird habitat, and ensuring access to this prey base by minimizing human disturbances in the area.

Red-legged Frog

- Determine the distribution and abundance of the red-legged frog and habitat used by the frog through monitoring efforts conducted annually between January 15 and April 15. Survey for egg masses to ensure wetland habitats allow for breeding.

- Determine the impacts of the introduced bullfrog on red-legged frog populations.

Steller Sea Lion

- Identify extent of sea lion and seal use of the New River area (i.e., haul-out points along the beach, feeding areas near river mouths, and within the New River estuary). Protect pups and haul-out areas from human disturbance.

Western Pond Turtle

- Determine distribution and relative abundance of western pond turtle and monitor its status in the New River ACEC.

- Implement habitat improvements for this species as opportunities become available.

Western Snowy Plover

- Implement the recovery plan for the Pacific Coast Population of the Western Snowy Plover when it is finalized by U.S. Fish and Wildlife Service. Implement the draft recovery plan in the interim.

- Manage and continue restoring Western Snowy Plover breeding and wintering habitat on the foredune.

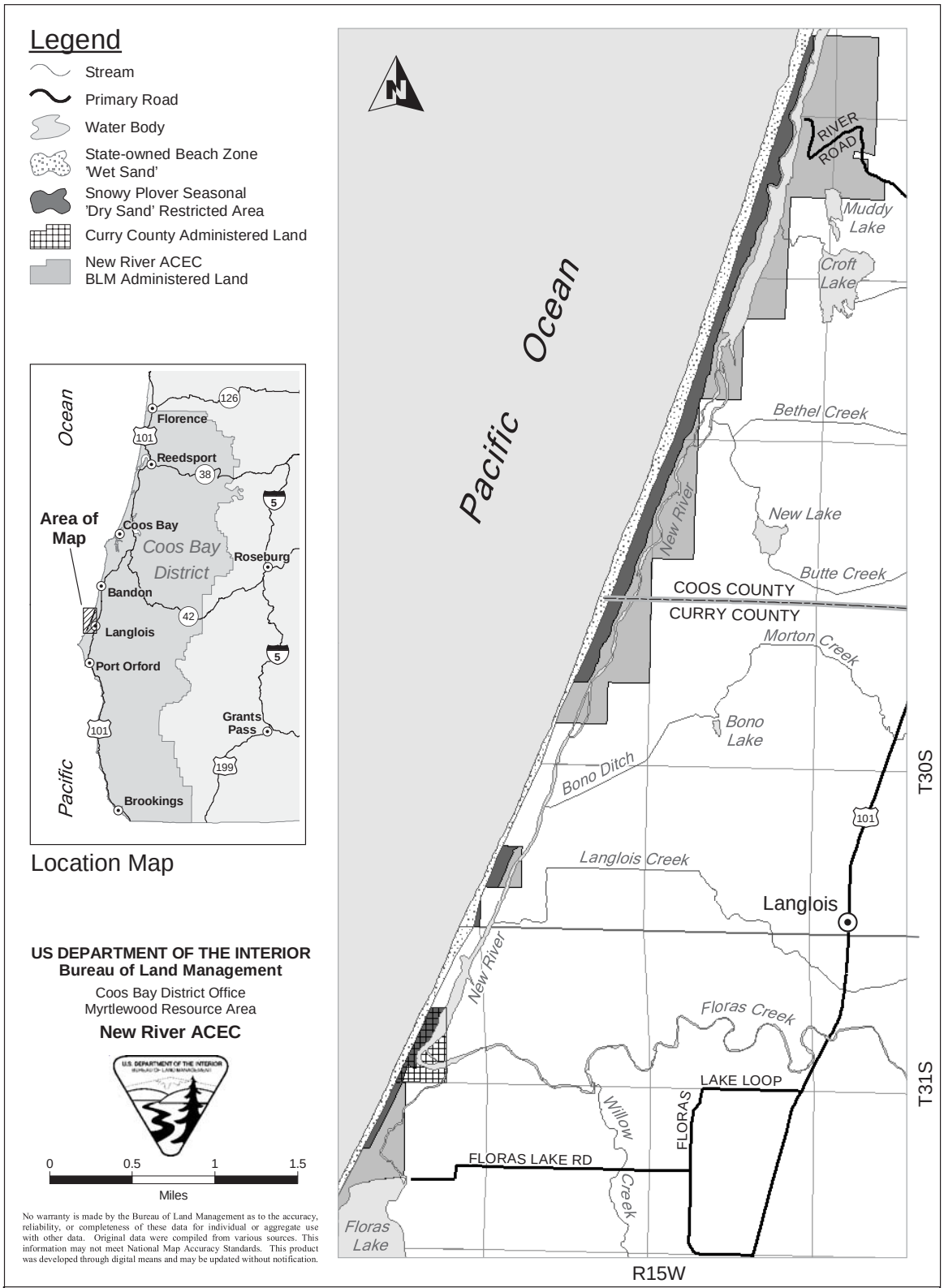
- Restrict public vehicular access to the boat launch at Storm Ranch during the plover nesting season. This limits the amount of people and watercraft accessing New River and the foredune, which lessens disturbance to nesting and brooding plovers and other wildlife in the area.

- Support the Oregon Parks and Recreation Department's Habitat Conservation Plan when it becomes final. Continue to partner with various agencies represented by the Plover Working Team to ensure cooperative management across public lands.

- At Floras Lake, implement dry-sand restrictions as outlined in the Cooperative Management Agreement between BLM and Curry County, which restricts public access to plover nesting area from March 15 through September 15. See Objective 9: Coordination and Cooperation for details of this agreement.

- On the foredune west of New River, implement dry-sand restrictions from March 15 through September 15. Restrict recreational use to these areas, but allow non-motorized use on the wet sand beach. See Map 4. Snowy Plover Seasonal Beach Restrictions.

- Require dogs to be leashed adjacent to snowy plover breeding areas.



Map 4: Snowy Plover Seasonal Beach Restrictions

Designated snowy plover nesting area along the foredune of New River.

Yuma Myotis

- Determine the distribution and relative abundance of the Yuma myotis bat, other bat species, and habitat used by bats through monitoring as per the Coos Bay District Bat Monitoring Plan.

Actions Accomplished or On-going

General Botany

- Since 2001, yearly mushroom monitoring has been conducted to ensure mushroom beds are not being destroyed by illegal harvesting. This compliance monitoring has helped determine the effectiveness of law enforcement strategies to control the illegal collection of forest products within the ACEC.

- A vegetation map of the historic plant communities of New River was prepared by Christy (2000, 2002) based upon survey notes taken by the General Land Office surveyors in 1857 and 1880.

Exotic Plants and Noxious Weeds

- Since 2002, BLM has implemented a yearly exotic and noxious weeds eradication project throughout the New River ACEC. Over thirty acres of habitat have been mechanically treated to remove gorse, Scotch broom, Himalayan blackberry, silver wattle, and pampas grass. Based upon monitoring results, areas are retreated as needed to ensure weeds do not recolonize the area.

Special Status Plant Species

Pink sand-verbena

- In 2000, an experimental population of pink sand-verbena was established on the New River foredune Habitat Restoration Area (HRA) through a Challenge Cost Share project. This work will be continued under a Cooperative Conservation Initiative with the Western Snowy Plover habitat recovery. The habitat restoration management should be continued by removing European beach grass, spreading pink sand-verbena seeds during the spring, and annually monitoring the population status and trends. Other monitoring and research activities described in the Final Conservation Strategy for the pink sand-verbena (USDI et al. 2004) should be implemented.

Seaside gilia

- In 2004, study of the reproductive biology, habitat type and requirements, population ecology, and conservation status and implications was initiated as part of a Challenge Cost Share project.

Silvery phacelia

- In 1995, a BLM conservation strategy was prepared for silvery phacelia (Rittenhouse 1995). It called for updating known occurrences, conducting additional inventory, monitoring population trends and habitat, site specific management of known populations, and coordination of conservation efforts. When an interagency conservation strategy is established for silvery phacelia, its suggestions should be adopted for use at New River.

Western lily

- In 1996, the BLM initiated recovery efforts through a Challenge Cost Share project with Berry Botanic Garden to establish an experimental *ex situ* population in the Storm Ranch/Muddy Lake area. Old and new seed, along with bulbs, were planted in two substrate types. Periodically trim the surrounding vegetation and annually monitor the population status and trends.

Wolf's evening primrose

- In 2004, a project to establish an ex-situ population of Wolf's evening primrose, a Bureau sensitive species not previously found at New River, was initiated as part of a Challenge Cost Share project.

General Wildlife

- Since 1996, breeding bird surveys have been conducted annually in and around Storm Ranch. Of the 171 bird species detected during this survey between 1996 and 2003, 86 have been identified as

potential or probable breeding species. Bird species should continue to be monitored in order to document changes in density and diversity which may occur over time.

- A program to monitor the affect of visitor-use related activities on wildlife behavior and habitat use is currently being implemented (Appendix H). This monitoring includes information about presence and absence of wildlife species in certain use areas associated with human activities. If adverse impacts occur, measures will be taken to reduce or eliminate such impacts.

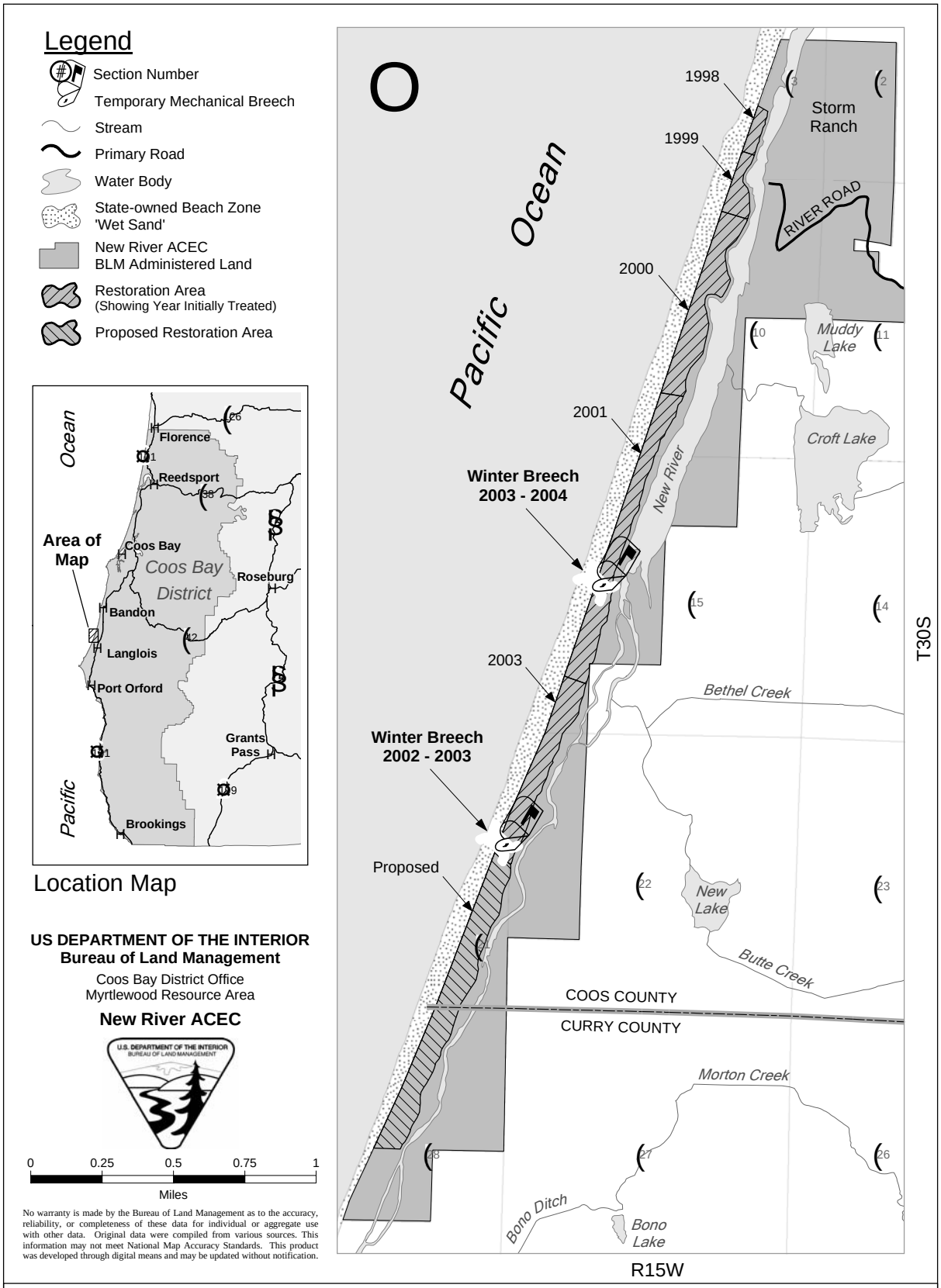
- Significant amounts of barbed-wire fence have been removed from the Storm Ranch, improving wildlife movement through the area.

Special Status Wildlife Species

Western Snowy Plover

- Since 1998, BLM has implemented a yearly habitat restoration project on the New River foredune designed to provide breeding and wintering habitat for the Western Snowy Plover. Approximately 160 acres of foredune have been treated (i.e., bulldozer use and prescribed fire) to remove European beach grass. Other native coastal dune species such as sanderling, sandpiper, and reintroduced pink sand-verbena have benefited as well. This coastal dune habitat restoration project has also been integrated with on-the-ground work needed to develop temporary breaches designed to improve aquatic habitat as described in Objective 2, Fisheries and Water Resources. Other than at temporary breach locations, a 50-foot buffer of European beach grass is left along the east side of the foredune to ensure that sand is not deposited into New River. See Map 5: Coastal Dune Restoration Area, for more details about the location of these projects within the ACEC.

Restored coastal dune habitat along the foredune of New River. Note the southern edge of the restoration area where European beach grass remains.



Map 5: Coastal Dune Restoration Area

Snowy plover hatchling

- In an effort to bolster the local Western Snowy Plover population, BLM and other state and federal agencies have combined efforts to implement a predator management program targeting non-native red fox, as well as other native predators (e.g., Common Raven and American Crow).

  The 2004 Western Snowy Plover breeding season will be the third year that the Integrated Predator Damage Management Program will be employed at plover nesting areas along the Oregon Coast (with the exception of one partial season at the New River ACEC in 1999). In the past, predation of plover eggs, chicks, and occasionally adults has occurred within the New River area, with Ravens, American Crows, and red fox accounting for the majority of the predation, although other predators (e.g., raccoon and Peregrine Falcon) are known to take plover too.

  The majority of predator management has been conducted at the three Southern Oregon Coast sites: Coos Bay North Spit, Bandon State Natural Area, and the New River ACEC. Managing ravens, particularly at New River, appeared successful in allowing plovers to raise chicks to the fledging stage. Of 218 predators removed at the three sites, 150 (69%) were Common Raven, 38 (17%) were American Crow, and 12 (5%) were red fox. As mentioned above, Western Snowy Plover nest and fledging success during the 2003 breeding season was the best since full-scale monitoring along the

Oregon Coast began in 1990. During the 2003 season, a record 59 young fledged and predator management at plover breeding sites was a key element to that success.

- In partnership, federal and state agencies conduct coast-wide monitoring. Twice a year, plover habitat is surveyed along the Oregon coast to assess population trends. These surveys are coordinated over the same time period in Oregon and more frequently in California and Washington for a range-wide perspective. ODFW and USFWS maintain and compare the survey data dating back to the 1970s. The agencies have also combined funds to support an intensive monitoring effort to assess Western Snowy Plover reproductive success. This work has been on-going since 1990. Biologists track breeding plovers, place predator exclosures around nests, and band birds. Data on reproductive success is summarized in annual report comparing and contrasting other nesting sites and prior years. Biologists and managers can then assess the effectiveness of various management measures to ensure compliance with the Endangered Species Act and ultimately the recovery of the species.

- BLM alone and in partnership with agencies that participate in the Snowy Plover Working Team has pursued several outreach efforts to better inform beach visitors about plover management. BLM has provided on-site interpreters in the New River area to answer questions and to ensure and track compliance with restrictions. These interpreters and other BLM staff also provide "naturalist programs" at nearby campgrounds and area schools. Several interpretative signs have been placed in the New River ACEC at key locations to help visitors understand the plover's plight and show restricted versus open areas. BLM has been actively involved with the Plover Working Team to develop a step-down outreach strategy as part of the Recovery Plan for Oregon and Washington. This strategy includes brochures, presentations, coordinated signage, and other outreach tools.

- Each breeding season BLM places symbolic fencing and signs to mark restricted areas for plover breeding throughout the ACEC. Employees monitor the areas and maintain fencing several times each week from March through September. BLM law enforcement staff and contracted sheriff deputies also monitor the restricted areas throughout the season.

Yuma Myotis

- Since 1995, bat boxes have been maintained on several structures in the Storm Ranch area, which are periodically used by the Yuma myotis bat.

Fisheries and Water Resources

Objective 2 – Establish suitable water flow and quality, and maintain areas in a condition supportive of a healthy aquatic ecosystem.

Reasons for Action

- Fish populations in New River have been declining. Oregon Coast coho salmon have been federally listed as a threatened species. Oregon Coast steelhead have been designated as a candidate for federal listing; and Pacific lamprey, western brook lamprey, and river lamprey are being petitioned for federal listing.

- South Coast fall run stocks of Chinook, south of Bandon are listed as state sensitive by ODFW (1992). Pacific lamprey, coastal cutthroat trout and coastal steelhead are listed as vulnerable by ODFW.

- The BLM has a responsibility to conserve special status species and the ecosystems upon which they depend.

- As part of the Riparian-Wetland Initiative, the BLM is charged with restoring and maintaining riparian-wetland areas so that 75% or more is in a properly functioning condition.

- Many organisms in the New River area depend on a clean, year-round water source. Maintenance of good perennial water quality and quantity is essential to ensure healthy and productive plant and animal communities.

- Due to agricultural purposes, wetlands throughout the watershed have been converted to cranberry production and pastures for livestock grazing. Cooperative management could improve many of the wetlands' functions and processes and thereby ensure a perennial flow in New River.

- Increased local development and water use on nearby lands will affect water flow quantity and quality, and the health and diversity of New River's aquatic ecosystem.

- Natural breaching is an important component of New River. Timing and conditions surrounding natural breaching, and even the location of the breach all play a role in the river's health. Mechanical breaching, used periodically to relieve flooding, can change channel dimensions, water flow volume and duration with either positive or negative effects. Mechanical breaching at northerly locations may enhance the quality of the aquatic habitat by retaining the length of New River.

Planned Actions

Fisheries

- Assist in revising the basin-wide Fish Management Plan to restore the Floras Creek-New River fisheries, which includes coho and Chinook salmon, steelhead and cutthroat trout, and their habitats. Other cooperators in the restoration effort may include private landowners and other interested organizations and individuals. This may be part of the local watershed council discussed below under water quality.

- Inform the public about angling restrictions and work with the State Police and ODFW to enforce salmon angling closures and catch limits along New River, especially at Storm Ranch.

- Coordinate with adjacent ranchers to monitor and assess the likelihood of stranding adult and juvenile salmon and steelhead in pastures during mechanical breaching events.

- Cooperate with ODFW in future smolt trap operation and other data collection.

- Conduct an angler creel survey jointly with ODFW for catch of anadromous fish in New River to determine fish populations, age structure, composition, and the fishing pressure.

- Conduct a basic inventory for cutthroat and coho salmon and Chinook salmon, independent of creel surveys.

- Continue to gather baseline information on breaching, flows, and habitat use by all fish species.

- Use aquatic invertebrate sampling techniques to monitor and evaluate general water quality in New River.

Watershed/Riparian

- Manage the area to protect riparian vegetation from human disturbance by restricting vehicle access at key points and controlling livestock activity. If riparian vegetation shows sign of excessive disturbance caused by recreation activities, adjust visitor use management strategies to reduce or prevent impacts.

- Monitor fisheries enhancement projects using large woody debris to determine benefits and apply knowledge gained to future projects.

- Determine the ecological status (i.e., condition, successional stage, and trend) of riparian and wetland vegetation by monitoring key species along the margins of New River. Accurate riparian and wetland vegetation maps are necessary to establish baseline conditions and trends. Low level photography and on-the-ground plots will help establish trends.

- Determine how the river is changing as vegetation stabilizes along the river and upland management improves. Cross-section and gradient profiles will establish a baseline condition.

Water Quality

- Establish a coordinated water quality monitoring program for New River and associated drainages in cooperation with state and county agencies, watershed associations, and adjacent private landowners. This program would be part of a proactive management effort to: 1) detect overall changes in water quality; 2) identify specific contaminants; 3) develop recommendations to deal with existing problems; and 4) identify preventive conservation measures to improve water quality of New River.

- Evaluate water quality conditions for selected physical and chemical parameters over a range of flows. Based on results of analysis, make recommendations for improvement of water quality if necessary.

- Chart salinity regimes in New River to correctly delineate the various riverine and estuarine habitats so that appropriate management techniques can be applied to each. Also, review trends in saltwater wedge incursion to learn more about physical processes at New River.

Water Quantity/Stream Flow

- Strive to maintain a perennial or year-round flow of New River through the implementation of water conservation management strategies consistent with other resource goals and objectives.

- Focus on prevention of channel drying during summer along all portions of the river. Ideas for increased water flows include:

    a) Stabilize movement of the New River channel by maintaining vegetation along stream sides to hold sandy soils in place and reduce bank erosion. Riparian vegetation slows water velocities and aids the recharge of adjacent floodplains during high flows. Although some of this water is lost to evaporation and transpiration, more water is detained after flood events, and is discharged as spring-summer stream flow.

b) Allow uninterrupted natural vegetative succession along the floodplain and margins of New River.

c) If the desired condition of woody vegetation is not being met, consider planting native woody vegetation such as willows in bare areas, or where early seral vegetation is found to improve the functioning condition of New River.

d) Utilize breaching processes to flush sediment out of the river channel, thereby increasing channel depth and water storage.

Natural and Artificial Breaching

- Support mechanical breaching to improve the rivers health or in instances where floodwaters threaten human life or could destroy valuable improvements. Beneficial effects of mechanical breaching may include improving river channel depth to maintain continuous summer flows and lowering high summer stream temperatures. Mechanical breaching should be used as a tool to improve river conditions in an effort to re-establish natural breaching processes.

Actions Accomplished or On-going

Fisheries

- Stream flow conditions and fish distribution were monitored from 1988 to 1996 by BLM fisheries biologists to determine locations and duration of intermittent flow in New River and to document distribution, growth, and peak migration dates of juvenile Chinook salmon throughout the summer. Seining was conducted to determine fish species. This monitoring should be continued periodically to understand changes to the fisheries.

- In 2002, ODFW, in collaboration with the BLM, installed a seasonal smolt trap operation at the outlet of Floras Lake to analyze fish species diversity, distribution, and the timing of out-migration to the ocean.

Smolt trap in operation on Floras Lake outlet.

Watershed/Riparian

- In 2001, the existing grazing permits within the ACEC were analyzed in an environmental assessment (EA OR-128-01-11). Based on the Decision Record of this EA and after negotiating with the ranchers, the grazing permits were converted to Cooperative Management Agreements (CMAs). The CMAs allow livestock to graze in designated portions of the ACEC located outside of the New River corridor, while excluding livestock from accessing the river on both BLM and private lands. This was accomplished by installing several miles of riparian fencing with a setback ranging from 50 to 350 feet. This should lead to the recovery of riparian vegetation, improved bank stability, and water quality within the fenced riparian zones.

- Continue photo point monitoring within each Cooperative Management Agreement area to document recovery of the newly protected riparian areas. Photos should indicate any changes in vegetation over a period of years.

- The South Coast and Coquille Watershed Councils have been established since the original New River management plan was completed. Both organizations are actively collaborating with the BLM and area stakeholders to carry out a variety of monitoring and restoration projects. To date, these watershed councils have accomplished fish passage, riparian fencing, and tree planting projects; installed instream wood structures to create fish habitat; and completed sediment reduction projects through road treatments and bio-engineering to improve water quality throughout the New River watershed.

- Large wood structures were constructed in 2003 along the eastern bank of New River on private ranchlands to restore the eroding banks and improve stream channel complexity. Continue to construct additional large wood structures if monitoring results show the project is effective.

- An on-going riparian tree planting project is being conducted along Floras Lake outlet and New River to establish native vegetation along these waterways. The purpose of the project is to improve bank stability and riparian function. In spring of 2003 and 2004, over 2,000 Sitka and Shore pine seedlings and 4,000 Hooker's willow cuttings have been planted.

- A Proper Functioning Condition assessment was conducted for the riparian areas along New River and its tributaries west of Highway 101.

Natural and Artificial Breaching

- Temporary mechanical breaches were conducted within the ACEC during the 2002-2003 and 2003-2004 winters (EA OR-128-03-11). These breaches were effective at channel deepening and providing flood alleviation of adjacent ranch lands. To date, the 2003-2004 winter breach located north of New Lake outlet was the most successful at achieving this balanced management approach. On-the-ground work needed to develop temporary breaches has been integrated with the coastal dune habitat restoration project described in Objective 1: Plant and Wildlife Resources. See Map 5: Coastal Dune Restoration Area, for the location of past mechanical breach sites within the New River ACEC.

- Continue to conduct channel profiles in subsequent years following mechanical breaching to determine if deepening and narrowing of the channel is contributing to increased water quality and improved aquatic habitat (e.g., reducing amount of non-native aquatic weeds).

Cultural Resources

Objective 3 – Protect and interpret important cultural resources at New River.

Reasons for Action

- By law, BLM is required to protect cultural resources. These laws include the Archaeological Resources Protection Act, American Indian Religious Freedoms Act, National Historic Preservation Act, and the Native American Graves and Repatriations Act.

- The Coquille Indian Tribe and Confederated Tribes of Siletz Indians, both federally-recognized tribes, have expressed concern about protection of cultural sites along the Southern Oregon Coast.

Planned Actions

General

- Document the history and prehistory of the New River area, including the activities, fish runs, and other uses in the New River area through the use of historic literature searches, oral interviews with long-time residents, official documents, local libraries and courthouses, and field investigations.

- Avoid ground disturbing activities in locations where significant cultural resources exist. Mitigate any unavoidable impacts through coordination with the State Historic Preservation Officer.

- Allow for the analysis of cultural resources and past environments in the New River area. Any proposed research shall follow guidelines in the Coos Bay Record of Decision and BLM 8100 series manual, as well as all applicable cultural resource laws, rules, and regulations.

- Contribute to site evaluation, interpretation, and cultural preservation by determining site excavation needs. Evaluation-level excavation is needed to determine the significance and condition of sites and eligibility for listing on the National Register of Historic Places. Mitigation-level excavation may be needed if visitation is expected to have a direct adverse impact on cultural resources.

Native American Concerns

- Consult with interested Indian tribes before initiating any interpretation of Native American uses or ground disturbing activities which may damage cultural resources in the New River ACEC.

- Coordinate cultural resources programs, including any planned excavation, with interested Indian tribes. Provide opportunities for tribal members to participate in excavations.

Actions Accomplished or On-going

- Continue working with the Indian tribes in gaining a better understanding of the paleo-environments and prehistory of the area.

Recreation

Objective 4 – Accommodate low-impact recreational use at New River while providing a variety of experience opportunities to help meet existing and anticipated demands.

Reasons for Action

- The New River ACEC has a dual designation as a Special Recreation Management Area. This designation acknowledges BLM's commitment to provide specific recreation activities and experience opportunities at New River in a manner that is compatible with protecting the natural and cultural resource values of the ACEC. Visitor use needs to be managed in a manner that does not diminish the integrity of these resources.

- New River's natural and cultural resources may be affected by human presence and use. This calls for a balance between public recreational use at New River and protection of its resources.

- Protecting the natural, cultural, and aesthetic values at New River will help to preserve the values of the ACEC for future visitors.

- Hunting on the BLM-administered lands north of Croft Lake outlet along New River, at Floras Lake, and at Lost Lake is a significant safety concern since these areas are focal points for other recreational pursuits.

- New River continues to be attractive to visitors for traditional uses such as waterfowl hunting and fishing. At the same time, the area provides outstanding opportunities for low-impact recreation activities, such as wildlife viewing, hiking, canoeing and kayaking, and picnicking. Balancing the needs of all user groups in a compatible way is necessary.

- Manage for specific recreation opportunity settings to ensure a quality experience for visitors.

Planned Actions

General

- Recreation management will primarily focus on the Storm Ranch and Floras Lake areas of the ACEC with a secondary recreational management emphasis at the Fourmile Creek and Lost Lake sites.

- Visitors will be encouraged to use established roads, trails, fishing areas, and other primary use areas (e.g., learning center, boat launches, wildlife viewing platform, and picnic areas).

- New River will be managed to provide two recreational opportunity settings – roaded natural and semi-primitive non-motorized.

Recreational Activities

- Limit use of motorized vehicles within the ACEC to designated roads and parking areas.

- Accommodate low-impact, non-motorized activities, such as: wildlife observation, nature study, hiking, walking, jogging, photography, picnicking, canoeing and kayaking, fishing, bicycling, and horseback riding.

- Allow camping for educational, research, or other work-related purposes. Camping will require a permit with a two-week advance notice. Camp stoves will be allowed, but no open fires are permitted except by special arrangement.

- Allow primitive beach camping by special recreation permit at a designated site within the ACEC for long-distance backpackers hiking the Oregon Coast Trail. A Special Recreation Permit system will be developed for this purpose by a BLM interdisciplinary team. Permit conditions will require the permittee to abide by stipulations designed to ensure protection of ACEC values (e.g., nesting snowy plovers during the summer). The permit will include educational materials that emphasize low-impact use of the area. Coordinate with OPRD and Coos and Curry County Parks Departments to implement the permit system.

- For public safety reasons, close BLM lands north of Croft Lake outlet and at Floras Lake to hunting. Waterfowl hunting along New River south of Croft Lake outlet on BLM lands is allowed. Hunters are encouraged to dismantle temporary blinds after use and properly dispose of all spent shotgun shells.

- In cooperation with ODFW, monitor hunting usage within the New River ACEC to determine if excessive impacts are occurring. Address issues as they arise to prevent undesired conditions.

- Discourage uses that are loud, disruptive to wildlife, interfere with the life cycle of any plant or animal, pollute or damage the area, or involve soil disturbance.

- Large group activities that are not compatible with the goals and objectives of the ACEC will be discouraged due to concerns for the natural and cultural resources and the recreation settings of the area.

- At Floras Lake, maintain year-round, non-motorized access across the footbridge at the lake outlet. Manage access and recreational use of adjacent ACEC lands to ensure compatibility with natural and cultural resource values.

- Direct the public to comply with seasonal dry-sand restrictions along the foredune during the Western Snowy Plover nesting season (March 15 through September15). This includes directing the public by posting informational and regulatory signs, physically delineating sensitive breeding areas, and providing on-site staff. Breeding areas will be delineated on both the beach and river sides of the foredune to inform hikers and boaters of the restrictions.

- Surface disturbing activities that result from digging up detected articles with a metal detector are prohibited (CFR 8365.1-5). However, the use of metal detectors is not prohibited on BLM lands unless expressing prohibited within a designated area by a supplementary rule. If metal detecting results in any ground disturbance at New River, a supplementary rule will be established to prohibit their use within ACEC.

Recreation Use

- Implement the monitoring and evaluation guidelines detailed in Appendix H to manage recreation use so that impacts to the natural setting are avoided. This includes a visitor use monitoring plan to understand changing trends in visitation, a survey to understand the quality of visitors' experience and their receptiveness to interpretive and educational programs. If monitoring shows a type of recreation is causing undesired resource damage or disturbance, then management actions will be employed to lessen or eliminate the condition.

Actions Accomplished or On-going

- BLM has published supplementary rules for recreation management of the New River ACEC in the Federal Register to implement restrictions, closures, and prohibited acts for the area. These include: prohibiting the use of off-highway vehicles, camping without a permit, collecting forest products and animals, allowing pets off leash; and establishing a seasonal beach closure at Floras Lake to protect the Western Snowy Plover (Vol. 61, No. 71, April 11, 1996).

- BLM revised dry-sand closures along the ocean beach during the Western Snowy Plover nesting season via Federal Register Notice Vol. 69, No. 70, April 12, 2004. This revision states that public access to Western Snowy Plover nesting areas within the ACEC shall be seasonally restricted from March 15 through September 15. These areas include the dry upper portion of the beach (above the mean high tide line) to the deflation plain east of the foredune in all portions of ACEC with the exception of BLM land located in the south 0.6 miles of T. 31 S., R. 15 W., Section 8, and the south

0.25 mile of T. 30 S., R. 15 W., Section 28. In the event that plovers nest within the ACEC not closed by this notice, BLM will exclose the nest(s), post the immediate area closed, and rope around it to limit disturbance.

- BLM has developed an on-going monitoring and evaluation process to guide recreational use management at New River in order to avoid unacceptable impacts to the natural resource and recreation settings (i.e., roaded natural and semi-primitive non-motorized settings) of the area (Appendix H). This process is similar to the Limits of Acceptable Change (LAC) planning system developed by the U.S. Forest Service for wilderness areas (Stankey et al. 1985). In order to adapt the LAC process to management at New River, only certain components of the framework have been incorporated. The intent remains the same: to maintain an appropriate balance between protecting resource values and providing recreational opportunities for the visiting public.

- BLM has posted general informational and regulatory signs at public access points throughout the ACEC to inform visitors about proper use of the area.

Environmental Education and Interpretation

Objective 5 – Promote awareness and appreciation for New River's many resource values, especially those significant to its ACEC designation; also foster a "Leave No Trace" / "Minimum Impact" land use ethic and similar attitudes in visitors at New River.

Reasons for Action

- Environmental education and interpretation will encourage responsible use of the New River area, thereby reducing resource degradation and vandalism. Special emphasis will be placed on educating visitors about special status species and rare habitats.

- Education and interpretation enhances the visitors' experience.

- Education and interpretation is necessary to communicate the uniqueness of the New River ACEC and BLM's management goals to visitors.

- Visitors who are aware of the area's uniqueness have a greater sense of stewardship and provide public and political support for the New River ACEC.

- Environmental education and interpretation can be used as a management tool for accomplishing visitor use and resource protection objectives.

Programs

The intent is to provide a spectrum of environmental education and interpretive activities for visitors to New River. BLM envisions programs at New River that encourage interaction with the landscape where learning is inspired and impacts are minimized, and where visitors leave with greater insights and an interest to learn more. The three broad objectives for environmental education are (1) to foster clear awareness of and concern about economic, social, political, and ecological interdependence in urban and rural areas; (2) to provide every person with opportunities to acquire the knowledge, values, attitudes,

commitment, and skills needed to protect and improve the environment; and (3) to create new patterns of behavior of individuals, groups, and society as a whole towards the environment.

The Ellen Warring Learning Center, dedicated in May 2001, provides a focal point for both interpretation and environmental education at New River. The learning center was designed in part to help meet program needs by providing space for a library and group gatherings, interpretive displays, storage of field equipment used by both naturalists and researchers, and living quarters for people conducting programs and/or research on site.

Environmental Education and Interpretive Themes

The environmental education and interpretation conducted at New River will continue to be planned and implemented according to the following themes:

Theme #1: The New River landscape is an intricate web of related parts that is constantly changing due to natural and human actions.

> **Topics:** human history · natural history · system dynamics · relationships · ecosystem concepts · plants and animals found at New River

Theme #2: Biodiversity is like putting money in the bank: it secures a healthy future for all of us, and is part of what makes the New River ACEC unique.

> **Topics:** biodiversity · threatened and endangered species · human impacts · ecosystem concept · habitats · interrelationships · introduced species · weeds · management goals · range

Theme #3: Good stewardship is critical in maintaining the health and integrity of New River.

> **Topics:** appropriate behavior · Watchable Wildlife how-to's · "Leave No Trace" / "Minimum Impact" outdoor ethic · management support and challenges · how visitors can get involved

Planned Actions

- Finalize the draft prospectus for environmental education and interpretation. Use its recommendations when developing and conducting programs and interpretive materials.
- Hire a seasonal interpreter, when feasible, to lead guided walks, assist with environmental education programs, and to staff the learning center during peak use periods.
- Special educational opportunities may include, but are not limited to: National Public Lands Day events, tree planting projects, Christmas bird counts, or similar activities that involve the public in benefiting New River.
- Provide interpretive signs at key locations throughout the ACEC to better educate visitors about the uniqueness of the area.
- Keep the web site on educational and interpretive opportunities at New River updated.

- Evaluate the effectiveness of environmental education programs and interpretive materials on a regular basis, and make modifications as necessary. This should include a monitoring and evaluation process to ensure programs do not result in unacceptable impacts to the area (i.e., determine appropriate group size, frequency, duration, location, season, and types of activities).

- Ensure that any interpretation which deals with cultural or paleo-environmental history is coordinated with interested Indian tribes and the Coos Bay District Archaeologist.

- Rotate or replace interpretive displays as needed. Where applicable develop supplemental materials to support interpretation and environmental education, such as trail guides, brochures, and educational kits.

Actions Accomplished or On-going

- A draft prospectus for environmental education and interpretation was written according to the guidelines given in the original New River ACEC Management Plan. Along with identifying goals for interpretation and environmental education, the plan includes general recommendations for New River, as well as site-specific information for each of the four public access areas. A survey was conducted to determine user groups, visitor demographics, potential opportunities, and need. The prospectus is meant to be flexible to management and visitor needs, and should be updated on a regular basis. Implementation of the plan will depend on funding, staffing, and partnership opportunities.

- Continue to host field trips for local elementary and middle schools at New River for students to learn about the unique natural environment of the area.

Bangor Elementary School students enjoying a field trip to New River.

- A feasibility study to address the educational potential, consistency with ACEC objectives, and the need for a research/learning facility was completed as part of the Coastal Environments Learning Network (CELN) Feasibility Assessment. It was determined that a large facility complex was not appropriate or needed at New River.

- A variety of interpretive displays have been developed and installed in the Ellen Warring Learning Center. Seasonal interpreters have been hired in past summers to staff the center and provide guided hikes for visitors.

- BLM hosts an annual National Public Lands Day event at New River to provide an opportunity for the public to volunteer their time working on restoration projects within the ACEC. In 2002, volunteers assisted with the removal of abandoned barbed-wire fences throughout Storm Ranch. In 2003, over 50 volunteers from local communities participated in a coastal dune restoration project at New River that involved the removal of European beach grass in habitat used by the Western Snowy Plover for nesting.

National Public Lands Day volunteers removing European beach grass to restore coastal dune habitat at New River.

- Interpretive signs have been developed and installed at key locations throughout the ACEC, including: a kiosk at the entrance area of Storm Ranch, the boat launch, Muddy Lake, Floras Lake, and along certain trails.

- BLM has developed a website for New River that provides the public with general information about the area, recreational opportunities, management goals and objectives, announcements, and a detailed environmental education guide for students and teachers. The website address is: www.or.blm.gov/coosbay/newriver.

Site Administration and Development

Objective 6 – Provide adequate use supervision, visitor facilities, services, signing, and programs to protect resources and support planned visitor use activities and levels.

Reasons for Action

- Visitation to the New River area is expected to grow as more people become aware of the area, and as population and tourism along the southern Oregon Coast increase.

- Facilities, designated roads and trails, signs, and other management tools (e.g., on-site personnel, regulations, permits, etc.) which direct recreational use ultimately reduce resource damage and can prevent future damage from occurring.

- Cooperative management between agencies is needed to enhance law enforcement support for the area.

Planned Actions

Structures and Facilities at Storm Ranch

- Add two benches inside the wildlife viewing platform at Muddy Lake and add cedar shingles to the roof (rather than lattice) to allow for use during inclement weather.

Trail System

- Re-route a short section of the Huckleberry Hill Trail to take advantage of a ridge-top overlook offering outstanding views of New River and the ocean. This re-route would be across an open sand dune and requires no construction or clearing of vegetation. In addition, visitors are already using this route to gain better views than the trail currently offers.

- If damage occurs from heavy foot, bicycle, or horse traffic, such as erosion or rutting, BLM may need to protect wet sections of trails with boardwalks, install water bars, or surface with wood chips. BLM may also restrict use of the area by limiting the number of visitors or re-designating trail use if chronic problems occur or if the combination of user groups results in conflicts.

- Coordinate with State Parks and Coos County to connect the Lost Lake Trail with an existing trail located on their lands that leads to New River. Cooperatively manage the trail system for non-motorized recreational activities. Coordinate with adjacent landowners regarding compatible management of the Oregon Coast Trail and recreational use on New River.

- Existing trails located on future acquired lands may be modified or maintained so long as they meet goals and objectives of the ACEC (i.e., compatible with protecting natural and cultural resources and the recreation settings of the area).

Directional and Regulatory Signs

- Inventory signs currently installed throughout the ACEC and develop a database to streamline maintenance.

- Install and maintain signs informing visitors to respect property boundaries and the privacy of adjacent residents at key locations, especially at the Lost Lake and Fourmile Creek access points.

User Fees and Permits

- Day-use and/or facility use fees may be established in the future to offset operational and maintenance costs for the ACEC. This could be accomplished under the auspices of the Fee Demonstration Program.

- For the purpose of resource protection, special recreation permits singly or in conjunction with a day-use fee may be established to better manage visitor use.

- A process for accepting voluntary donations may be established to support visitor-related programs and projects at New River.

Publicity

- Due to the unique resource values at New River, use an interdisciplinary process to carefully evaluate how any future publicity of the site by the BLM may impact ACEC values.

- BLM will not actively promote the New River ACEC via brochures or other media intended to attract large numbers of visitors, but when the public does request information, provide information that also includes sensitive resource concerns and rules of the area.

- Consider how publicizing New River in private guide books or other similar materials might affect visitation to ensure that overuse does not occur.

- Inform the public of BLM-sponsored activities and events at New River using local newspapers, flyers, mailings, and other related types of media. Such activities and events include: National Public Lands Day, tree planting projects, guided nature hikes, and other educational or volunteer-related projects that build public support for the ACEC.

Law Enforcement

- Enhance law enforcement at New River through annual coordination meetings with other agencies and interested groups.

- Patrol the New River area regularly. Increase the frequency of patrols during the snowy plover nesting season, the peak illegal mushroom gathering season, and high visitor use periods.

Hazardous Materials Management (HMM)

- District Hazardous Materials Contingency Plan applies to any spill or dumping of hazardous materials at New River that requires emergency response activities and removal.

- Federal Pollution Prevention Act of 1990, Executive Order 128.56, and Secretarial Order 3158 govern procedures for spill prevention, waste management and minimization. Activities on the ACEC should reflect the use of low environmental impact chemicals and substances, with minimal retention of any necessary hazardous materials on site. Site-specific activity plans shall be reviewed for potential HMM impacts. Employee awareness training should be kept current.

- Public Education and awareness of HMM should be integrated into outreach programs.

Fire Management

- Recognize the role of fire in the natural environment and utilize controlled burns to enhance desired habitat conditions within the ACEC.

- Suppress fires that do not meet ACEC goals and objectives, or that threatening life or adjacent private lands.

- Reduce potential adverse impacts to ACEC resources, public/private facilities and developments, and users by annually identifying specific fire tactics and strategies for the ACEC. Specific actions may include managing and manipulating brush and other fuels within the ACEC adjacent to these facilities and developments; selectively thinning fuels surrounding facilities to reduce fire hazard; and constructing a firebreak to reduce flammability, intensity, and rate of spread near or adjacent to private land.

- To meet fire suppression needs, place all existing ACEC land and future acquisitions east of New River under the State Protection Contract.

- Reduce the potential for accidental human-caused fires by prohibiting open campfires, except by special permit. Provide visitors with information, such as signs and brochures that inform them about the dangers of fire and ways to prevent human-caused fires.

Actions Accomplished or On-going

Facilities and other Infrastructure

- All of the original structures that were located at Storm Ranch have been removed (e.g., ranch house, barn, stable, and arena) and new BLM facilities have been constructed in their place (e.g., learning center, storage building/shop, well/pump house, and restrooms).

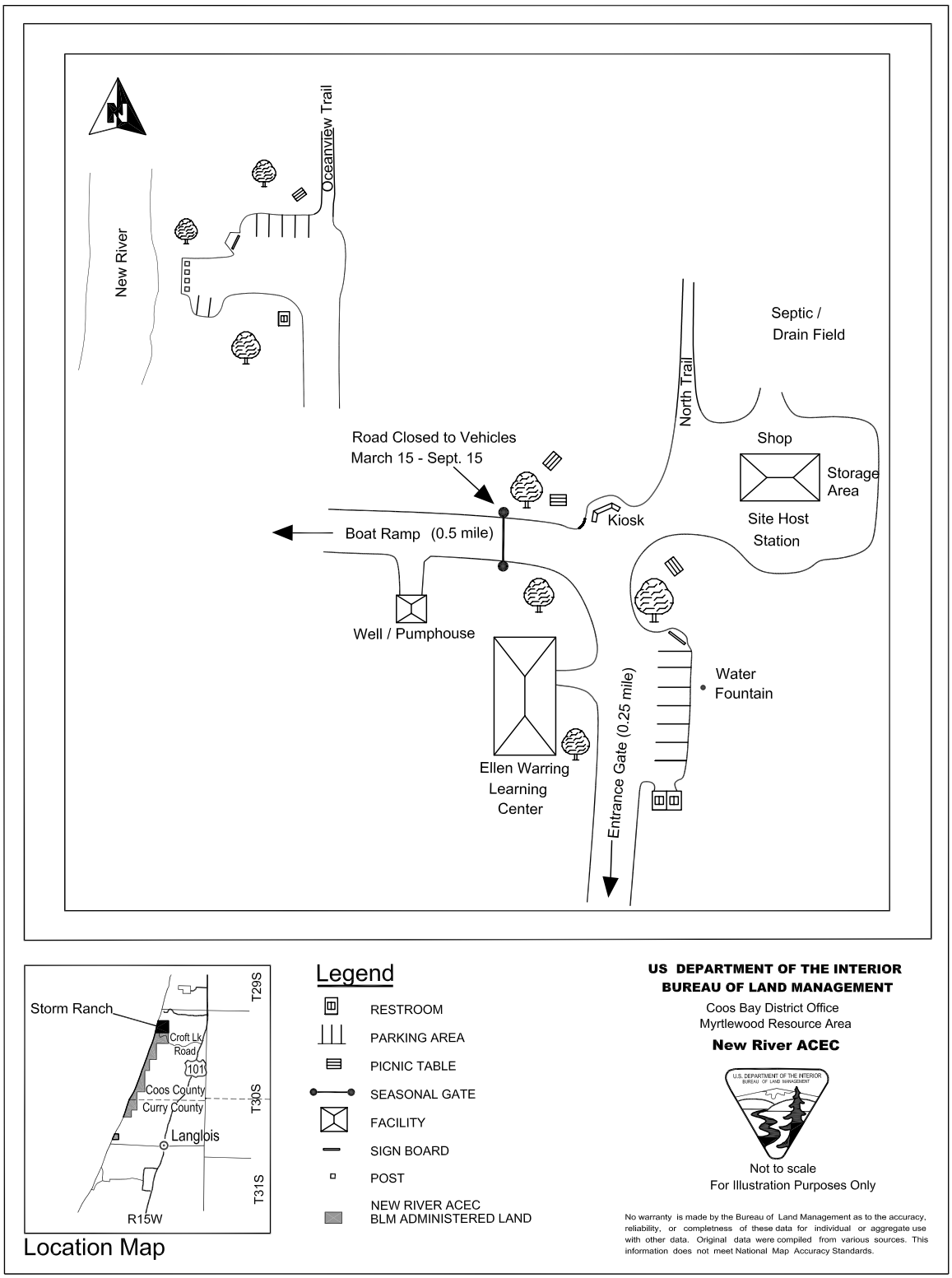
- Maintain the Ellen Warring Learning Center for environmental education, research, and administrative purposes.

- Maintain the storage building/shop at the Storm Ranch entrance area for storing supplies, maintenance equipment, and other items necessary for site administration and resource protection.

- Maintain the public water system (including maintenance of the well/pump house, drinking fountain, and septic system) within the developed area of Storm Ranch.

- Maintain one vault toilet at the Storm Ranch boat launch area and two vault toilets at the entrance area.

Figure 5. Storm Ranch Entrance and Boat Launch Areas



- Maintain the road at Storm Ranch. The entrance road to Storm Ranch and the main parking lot has been chip-sealed and should continue to be maintained this way. The gravel road from the entrance area to the boat launch area may also need to be chip-sealed in the future to reduce maintenance, improve accessibility for the disabled, and for dust abatement. Speed bumps may be necessary if speeding becomes a problem.

- Maintain existing parking lots at the Storm Ranch entrance and boat launch areas; East and West Muddy Lake, Floras Lake, Fourmile Creek, and Lost Lake Trailheads. The parking lot at Floras Lake is jointly maintained by the Curry County Parks Department.

- Maintain boat launches at Storm Ranch and Floras Lake outlet. The boat launch at Storm Ranch is designed for non-motorized access only. See Objective 7, Access.

- Maintain a few picnic tables at the Storm Ranch entrance and boat launch area. Include one or more picnic tables that is wheelchair accessible.

- Maintain the wildlife viewing platform at Muddy Lake.

- Continue to remove old barbed wire fences throughout the Storm Ranch area for wildlife safety.

Trail System

- Maintain existing trails within ACEC based on the types of use they are designed for, degree of difficultly, and level of accessibility. See Table 5: New River ACEC Trail System.

- Maintain directional fences along trails and other key locations for visitor use management.

- Maintain a primitive trail at the Fourmile Creek portion of the ACEC. This small parcel provides a put-in and take-out point for kayaks and canoes when vehicular access to the Storm Ranch boat launch is closed (March 15 through September 15). Boat access at this parcel requires a quarter-mile portage from the parking lot to New River.

- Maintain a primitive trail along the south side of Lost Lake and across the sand dunes, west to New River.

- Maintain minimum trail widths and heights to be consistent with each trail's designed uses. For example, branches should be trimmed higher on trails that allow horseback riders and wider on the trail that provides wheelchair access.

- Maintain foot-bridges and boardwalks to provide public access and minimize impacts across waterways and wetlands (e.g., Floras Lake, Lost Lake, and Muddy Lake Trails).

- Manage recreation use along the ocean beach and New River to minimize impact to ACEC values. See Table 6: Other Linear Recreation Use Areas Affecting the New River ACEC.

Table 5. New River ACEC Trail System

Name	Description	Designed For	Difficulty	Length
North Trail	Trail begins northeast of the learning center and provides access to Huckleberry Hill and Ridge Trails. This trail takes visitors by the old corrals of Storm Ranch, now bordered by manzanita and rhododendron. The trail is mostly flat and the surface varies from compacted soil and gravel to loose sand.	Foot, Horseback, Bicycle	Easy	0.2 mile
Huckleberry Hill Trail	Trail connects North Trail to Oceanview Trail and passes through meadow, forest, and shrub habitats. Trail rolls over some of New River's largest dunes with an excellent view of the ocean. Trail surface is primarily loose sand.	Foot, Horseback, Bicycle	Moderate, Difficult for bicyclists due to loose sand	0.4 mile
Ridge Trail	Trail passes over a large stabilized dune, winding through a shrub community of salal, manzanita, and huckleberry. The Coast Range is visible from some points. Portions of the trail are sandy.	Foot, Horseback, Bicycle	Moderate, Difficult for bicyclists due to loose sand	0.2 mile
Oceanview Trail	Trail travels through a dense forest along New River and connects with Huckleberry Hill Trail. A short side trail takes visitors to an overlook for views of the ocean and river. The terrain is relatively flat and the trail has a hard-packed surface.	Foot, Horseback, Bicycle	Easy, Difficult for bicyclists due to loose sand	0.2 mile
Oceanview Spur Trail	This short side trail takes visitors to an overlook for views of the ocean and river. The trail surface is mostly loose sand.	Foot, Horseback, Bicycle	Easy	0.1 mile
West Muddy Lake Trail	Trail begins at River Road and leads to the wildlife viewing platform at Muddy Lake. The trail follows an old road built by Jack Storm that has been modified for handi-capped accessibility. A small boardwalk has also been constructed across a wetland. The trail is relatively flat with a hard-packed surface.	Foot, Horseback, Bicycle, Wheelchair (universally accessible)	Easy	0.3 mile

Name	Description	Designed For	Difficulty	Length
West Muddy Lake Spur Trail	Trail begins off of West Muddy Lake Trail and leads to a viewing area along New River. The trail follows an old dirt road with a flat, hard-packed surface. The end of the trail is sandy and may require traversing driftwood to access the river.	Foot, Horseback, Bicycle	Easy	0.2 mile
East Muddy Lake Trail	Trail begins a short distance down River Road from the learning center. The trail crosses a footbridge and enters into a wide meadow before passing through a forest on the way to the wildlife viewing platform at Muddy Lake. The surface is firm with grass, gravel, or dirt substrate. This trail is wheelchair accessible for more advanced users.	Foot, Horseback, Bicycle, Wheelchair	Easy, Difficult for wheelchair users due to rough, uneven terrain	0.4 mile
Old Bog Trail	Trail begins off East Muddy Lake Trail in the open meadow and continues through forest and shrub habitats. Vistas of the Coast Range are along the trail. The trail ends at the edge of the historic Westmoor Cranberry Bogs. The trail has some steep sections with loose sand.	Foot	Moderate	0.3 mile
Floras Lake Trail	The Floras Lake Trail begins at the lower parking lot of the Boice-Cope County Campground. It crosses a footbridge over the outlet of Floras Lake and continues around the west side of Floras Lake to the ocean. The trail connects with the State Park trail system at Blacklock Point. The trail surface is loose sand and portions are inundated during the winter.	Foot, Horseback, Bicycles	Moderate, Difficult for bicyclists due to loose sand	1.0 mile
Floras Lake Spur Trail	Trail begins about one quarter mile west of the footbridge across the outlet of Floras Lake. This spur trail crosses a large coastal meadow and provides the most direct access to the beach. The surface is loose sand.	Foot, Horseback, Bicycles	Moderate, Difficult for bicyclists due to loose sand	0.2 mile

Name	Description	Designed For	Difficulty	Length
Fourmile Creek Trail	Trail begins at a small gravel parking lot along side Lower Fourmile Road. It crosses a wetland meadow leading to New River. The trail is relatively flat and its surface consists mostly of dense grasses.	Foot, Portage for canoe or kayak	Moderate	0.2 mile
Lost Lake Trail	Trail begins at a small parking lot on the east side of Lost Lake. It follows along the southern edge of the lake through a mature forest. On the west side of the lake, the trail traverses a series of large sand dunes to the western edge of the ACEC. The trail then crosses State Park and Coos County lands to New River. The beginning of the trail is flat with a hard-packed surface. The western portion has steep sections with loose sand.	Foot	Moderate	1.0 mile (BLM) 1.5 miles (total)

Table 6. Other Linear Recreation Use Areas Affecting the New River ACEC

Name	Description	Designed For	Difficulty	Length
Oregon Coast Beach Trail	This trail is managed by the Oregon Parks and Recreation Department. The New River section of this trail follows the wet-sand portion of the beach from the south side of the Coquille River mouth at Bandon to Cape Blanco State Park. It is 22 miles long and offers opportunities for a semi-primitive hiking experience. Most use takes place during the summer, when stream crossings are easier. Strong north winds during the summer encourage hikers to travel south. Seven miles of this trail borders the New River ACEC where special rules apply and a recreation permit is required for primitive camping.	Foot	Difficult	7 miles (BLM) 25 miles (total)

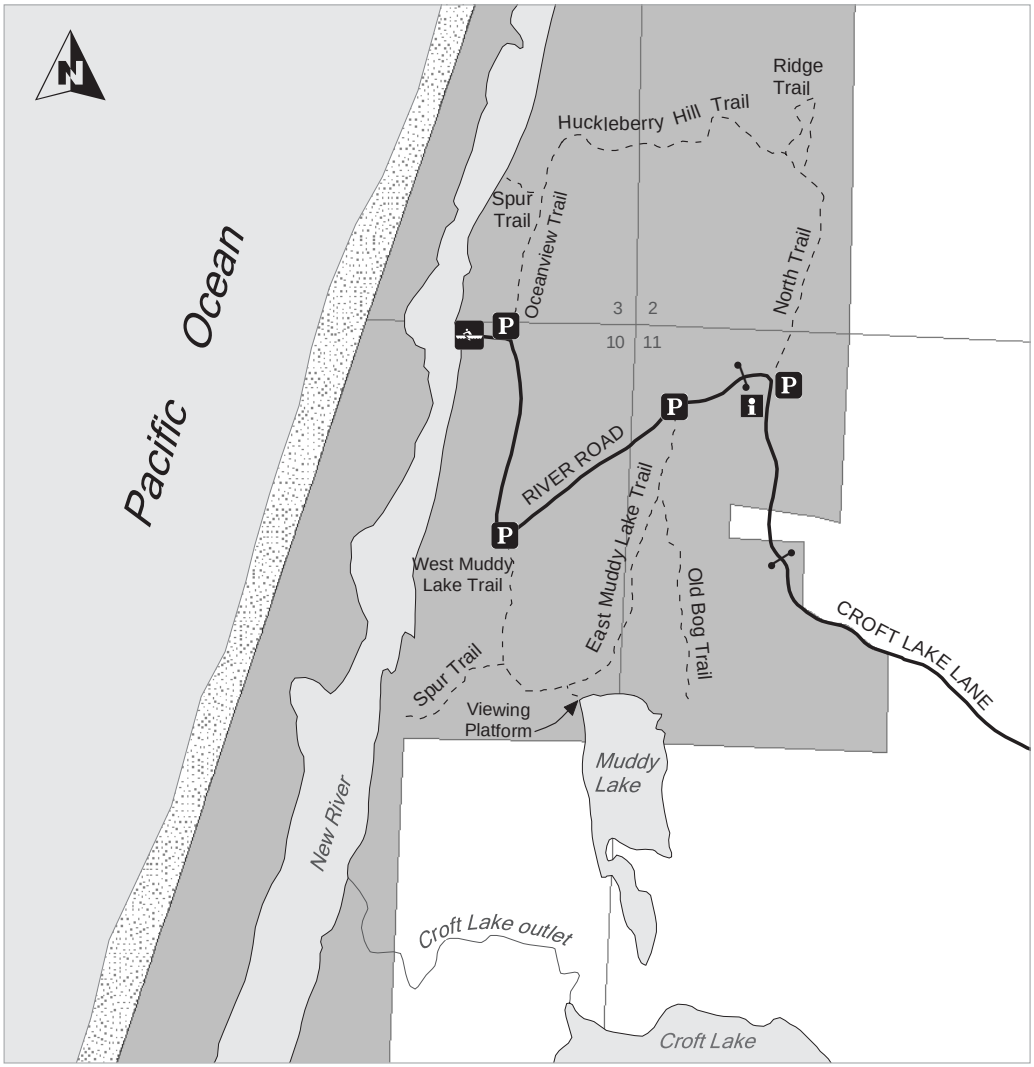
Name	Description	Designed For	Difficulty	Length
New River	This non-motorized float trip along New River begins at Boice-Cope County Park at the outlet of Floras Lake and ends at either the Storm Ranch boat launch or at the Fourmile Creek take-out point, distances of eight and ten miles respectively. During the winter, most boaters travel from south to north taking advantage of the current and the winds. During the summer, low-water conditions, strong north winds, dry-sand closures along the foredune, and vehicular access restrictions at Storm Ranch make use more difficult.	Non-motorized boats	Moderately Difficult	8 or 10 miles

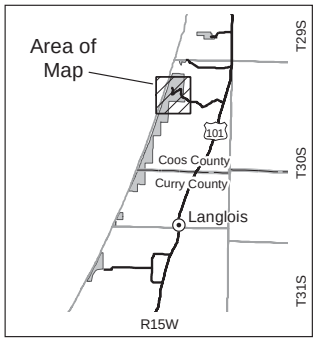
Directional and Regulatory Signs

- Maintain directional signs on Highway 101 to the Storm Ranch portion of the ACEC. These quarter-mile turn-off signs have a hiking symbol located below the words, "New River." The hiking symbol replaced the original binoculars logo since a majority of visitors to New River were expecting a roadside overlook. This change is expected to reduce turn-around vehicular traffic to the area. See Appendix H for more information about this logo change.
- Maintain the entrance sign to the Storm Ranch portion of the ACEC.
- Maintain informational and regulatory signs at key public use areas throughout the ACEC (i.e., entrance areas, trailheads, boat launches, seasonally-closed snowy plover nesting areas, etc.)
- Maintain trail markers/directional signs along designated trails.
- Maintain signs along the ACEC boundaries that state the area is closed to off-road vehicles.

Management Personnel and Site Host

- Continue to have a BLM staff person whose primary duty is to coordinate management of the ACEC.
- Continue to have a volunteer site host stationed at Storm Ranch to provide information to the public, encourage visitors to comply with regulations, perform minor care-taking responsibilities, and monitor visitor use.
- Continue to have a person perform routine maintenance duties within the ACEC.
- Continue to have a seasonal interpreter lead guided walks and assist with education programs during peak summer visitation.





Location Map

Legend

- Parking Area
- Learning Center
- Boat Launch
- Gated Road
- Section Line
- Stream
- Trail
- Primary Road
- Water Body
- State-owned Beach Zone 'Wet Sand'
- New River ACEC BLM Administered Land

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Coos Bay District Office
Myrtlewood Resource Area

New River ACEC

0 600 1,200 1,800
Feet

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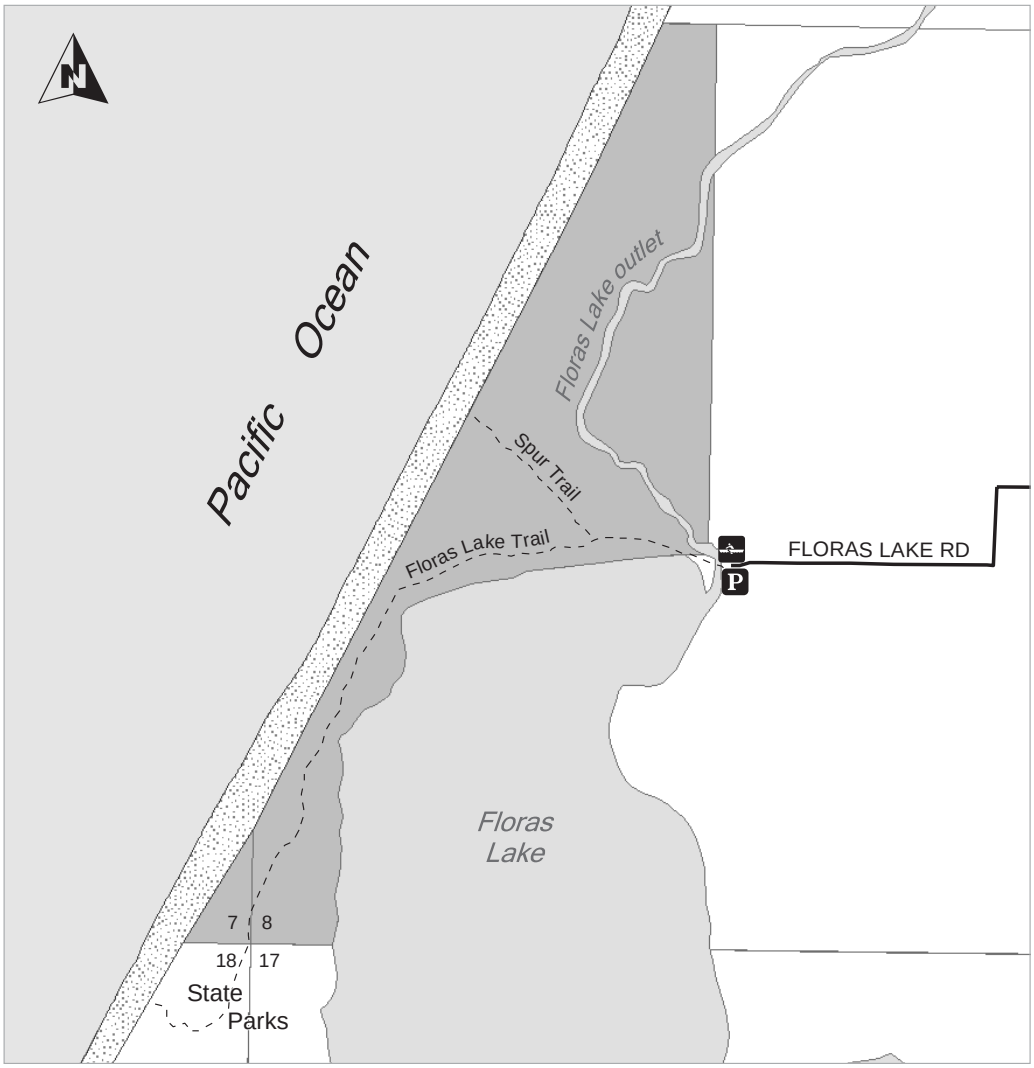
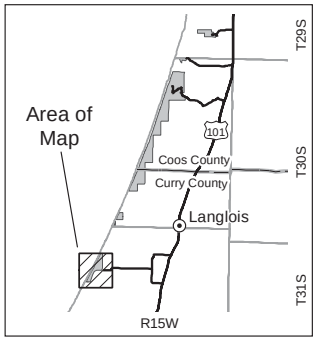
Map 6: Storm Ranch Trails





Location Map

Legend

- Parking Area
- Boat Launch
- Section Line
- Stream
- Trail
- Primary Road
- Water Body
- State-owned Beach Zone 'Wet Sand'
- New River ACEC BLM Administered Land

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Coos Bay District Office
Myrtlewood Resource Area

New River ACEC

0 600 1,200 1,800
Feet

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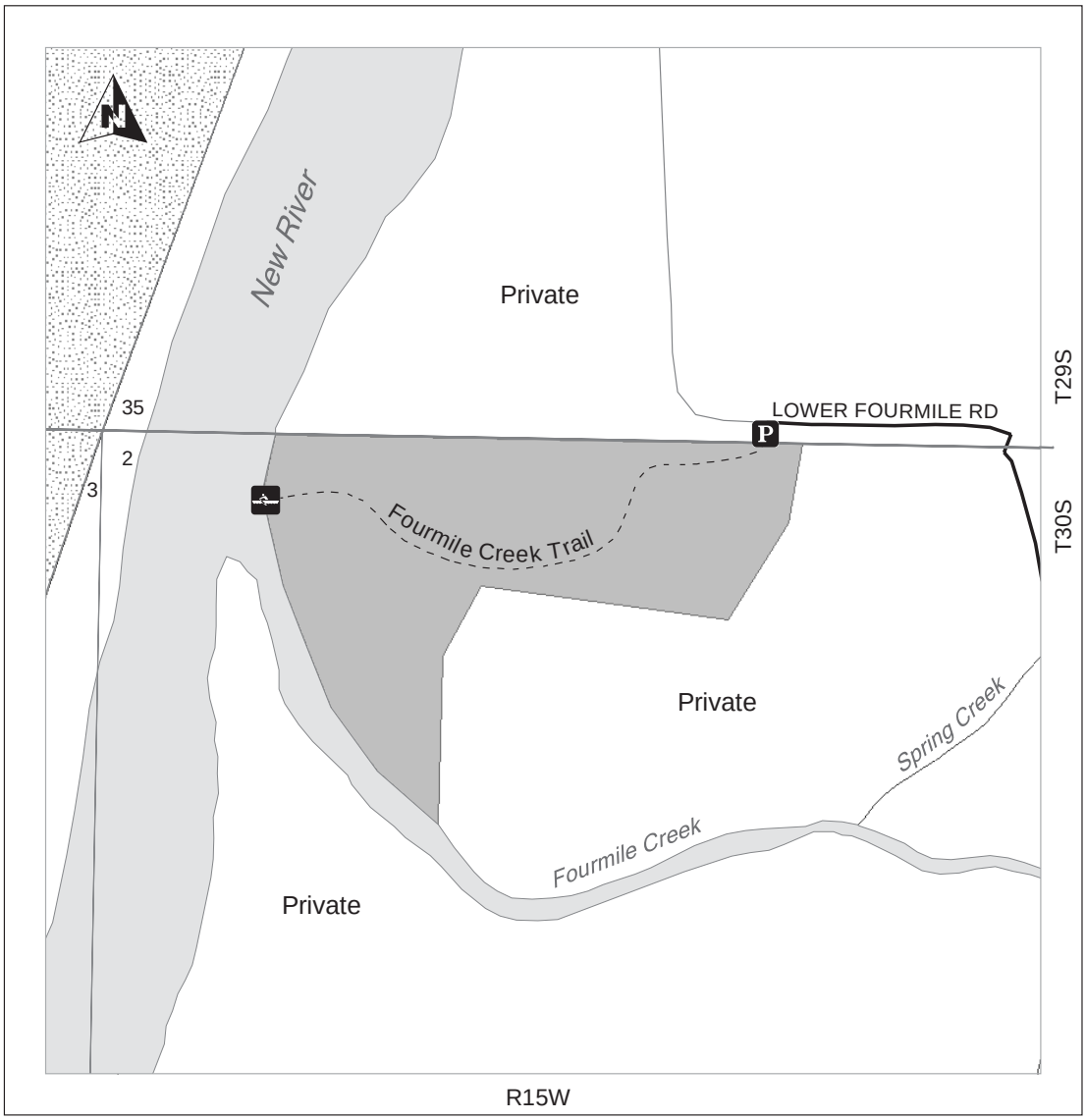
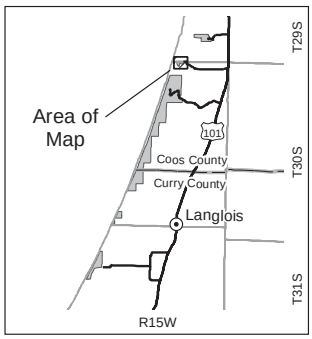
Map 7: Floras Lake Trails





Location Map

Legend

- Parking Area
- Boat Launch
- Section Line
- Stream
- Trail
- Secondary Road
- Primary Road
- Water Body
- State-owned Beach Zone 'Wet Sand'
- New River ACEC BLM Administered Land

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Coos Bay District Office
Myrtlewood Resource Area
New River ACEC

0 400 800
Feet

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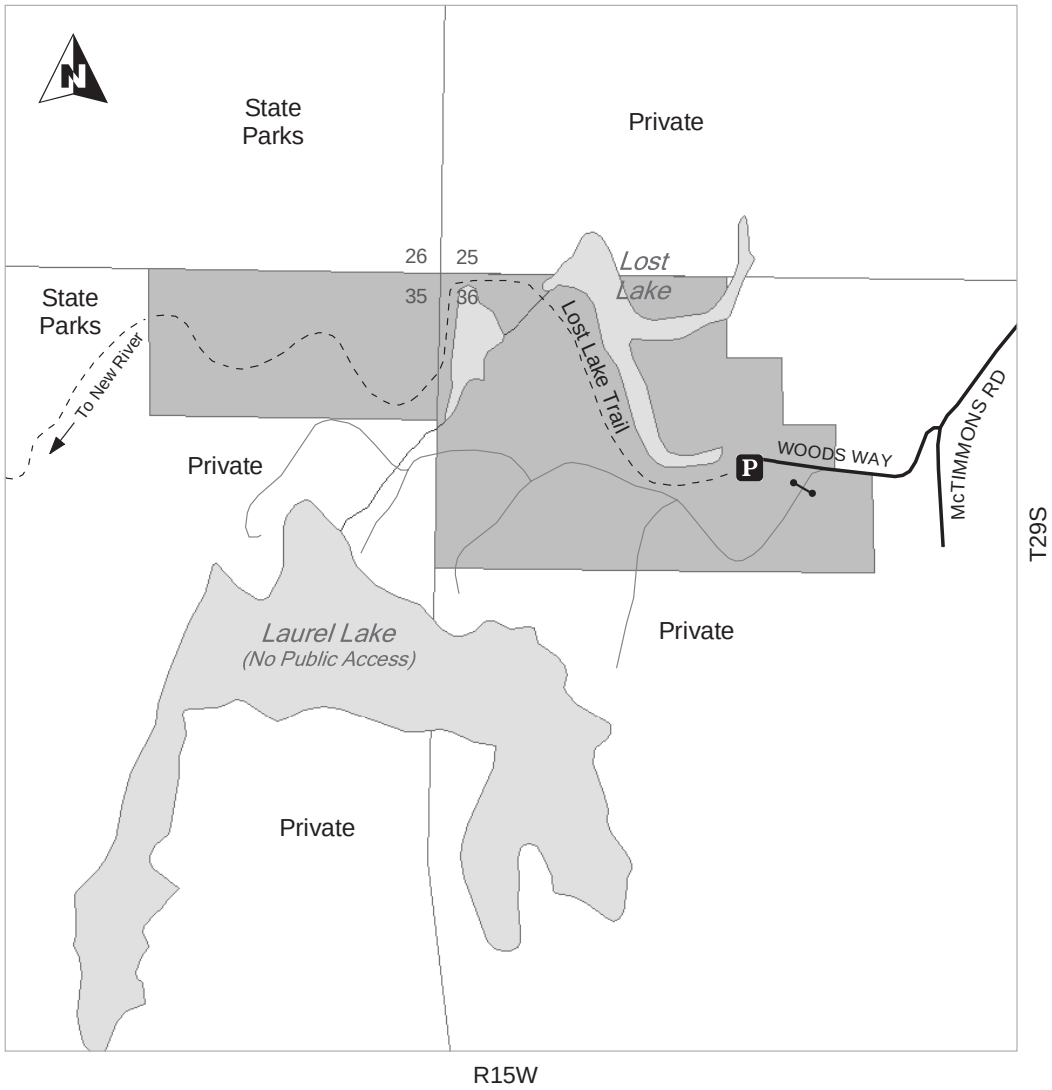
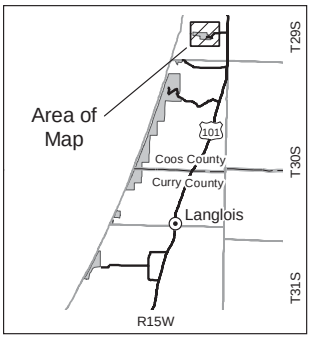
Map 8: Fourmile Creek Trail





Location Map

Legend

- Parking Area
- Gated Road
- Section Line
- Stream
- Trail
- Primary Road
- Authorized Vehicles Only
- Water Body
- New River ACEC BLM Administered Land

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Coos Bay District Office
Myrtlewood Resource Area
New River ACEC

0 500 1,000 1,500
Feet

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Map 9: Lost Lake Trail

Enforcement

- Law enforcement (i.e., patrols and response to problems) is primarily provided by a BLM Ranger and sheriff deputies according to joint Law Enforcement Agreements (LEAs) with Coos and Curry County Sheriff Departments. Additional law enforcement is provided by the Oregon State Police.

- Maintain an updated contact list to be used by the site host and enforcement personnel in case of emergencies or conflict situations.

Access

Objective 7 – Provide reasonable access to visitor use areas and the river with minimal impact on natural and cultural resources and visitor experiences.

Reasons for Action

- Access to New River was historically controlled by a few private landowners, and public access is needed.

- Unmanaged visitation to the New River area could result in degrading the area's natural and cultural resources.

- Off-highway vehicle use negatively impacts the success of the Western Snowy Plover, a federally threatened species, migratory shorebirds, and other coastal dune species.

- Mining access could degrade the scenic and unique resource qualities found at New River.

Planned Actions

General

- Allow public vehicular access to the Storm Ranch boat launch area via River Road from September 16 through March 14. Close the road to public vehicular access during the snowy plover nesting season from March 15 through September 15. The road will remain open to non-motorized use during this time.

- BLM may restrict use of the ACEC by limiting the number of vehicles or visitors to the area if resource damage becomes evident and no other management actions have resolved the problem. Appendix H describes other management actions that would be considered to resolve visitor impacts.

- Access to future acquired lands that qualify for ACEC designation, will be managed under the same goals and objectives unless more stringent protection measures are needed for specific areas designated as Research Natural Areas or Botanical Special Interest Areas.

Actions Accomplished or On-going

- Maintain gates and posts to prevent vehicular access to the following areas:

  a) Entrance gate to Storm Ranch, open daily from sunrise to sunset.

  b) Seasonal gate to the Storm Ranch boat launch area via River Road. This gate is open to vehicular access from September 16 to March 14, but closed to motorized vehicles the remainder of the year. This gate is located at the beginning of River Road adjacent to the learning center.

  c) Permanent posts at the Storm Ranch boat launch to prevent people from driving vehicles to the water's edge or along the banks of New River. These posts are designed to allow visitors easy access to the river by foot. The posts are removable for administrative access for maintenance and emergency purposes only.

  d) Permanent posts at the West Muddy Lake Trailhead. These two posts are designed to allow easy trail access for hikers, bikers, horseback riders, and wheelchair users, but restrict vehicles from accessing the trail. The posts are removable for administrative motorized access for trail maintenance and emergency purposes only.

  e) Permanent gate at the entrance to the old bog at Storm Ranch via Croft Lake Lane. This gate is used primarily by Coos-Curry Electric Cooperative to maintain their powerline easement.

  f) Permanent post at the foot-bridge across Floras Lake outlet. The post is designed to allow easy trail access for hikers, but restricts vehicles from accessing the trails and beach. The post is removable for administrative motorized access for maintenance or emergency purposes.

  g) Permanent gate at the Fourmile Creek parcel to block vehicle access to the wetland meadow. A pedestrian bypass around the gate will be installed for easier trail access.

  h) Permanent gate at the Lost Lake parcel to prevent non-authorized vehicles from accessing Woods Way beyond the public parking area.

OHV Designation

- Continue to enforce the off-highway vehicle limitation on all lands within the ACEC (including future acquisitions). Exceptions include: access on designated roads and parking lots; administrative access; and special permits for scientific research, monitoring, resource protection, and/or restoration projects (per Federal Register Notice Vol. 61, No. 71 dated April 11, 1996).

Mineral Withdrawal

- All BLM administered New River lands are closed to locatable (mining claims) and salable (construction sand and gravel) mining; approved April 1993. Future acquired lands will also be closed to these forms of mining.

Monitoring and Research

Objective 8 – Facilitate improved management of the New River area through monitoring and research to learn more about the natural and cultural resources of the area.

Reasons for Action

- Monitoring offers a means of ensuring compliance with federal and state laws and regulations.
- Filling existing information gaps enables the BLM to better manage the area in the future.
- Evaluating existing management strategies provides feedback to determine the success in meeting established objectives.
- Broaden human understanding of the area.
- Recovery needs for threatened and endangered species in the New River area must be identified.
- Conflicts between recreation activities and natural functions at New River need to be identified.
- Hydrologic functions at New River should be better defined.
- The dynamics of coastal ecosystems are not fully understood.
- Fisheries information could define Chinook salmon in New River as a unique population (that would ensure protection under the ESA should the need arise).

Planned Actions

A number of project-specific monitoring actions are incorporated with the objectives listed previously in this chapter. The reason for organizing the document in this way is to consolidate corresponding information together, rather than have it spread throughout the plan. However, some monitoring actions do not correspond to any specific objective or are too general. These actions are listed below along with all of the research actions.

Research actions are not incorporated with the other objectives, since they are not a requirement of the management plan. BLM fully supports research at New River and is willing to provide opportunities for other agencies and organizations interested in conducting research programs, as long as they are consistent with the goals and objectives of the ACEC. Research actions are ideas for projects that would broaden our understanding of the area.

General

- Develop a comprehensive New River ACEC Monitoring Plan that identifies priorities, objectives, methodologies, guidelines, data administration, management, and schedule of activities.
- Establish New River research priorities and sponsor research through an organized program.

- Seek funding for research projects by preparing grant proposals, in coordination with a “friends” group, other local groups, state and federal agencies, academic institutions, and private consultation firms.

- Provide opportunities for outside research projects consistent with the goals and objectives of the ACEC.

- Coordinate with private neighboring landowners regarding research projects that are adjacent or associated with their lands.

Archaeology

- Determine dates of occupation and the use and importance of sites by instituting a program for gathering and analyzing material from sites, possibly using carbon-14 testing and hydration of obsidian samples.

- Determine past environmental conditions by analyzing sediments, possibly including pollen and macrofossils.

- Monitor known cultural resources for evidence of degradation and continue to pursue locating unknown cultural resources that exist within the ACEC.

Botany

- Determine the plant associations and prepare a vegetation map at New River using the National Vegetation Classification System (NVCS) in order to obtain a complete picture of the diversity of plant associations both naturally-occurring and that originated from human activity. The NVCS is a hierarchical classification system that standardizes vegetation classification in the United States. Data may be collected from sample plots along permanent transects as well as larger reconnaissance plots scattered throughout the ACEC.

- Monitor long-term changes to vegetation due to plant succession and disturbance processes.

- Determine biomass production of matsutake (*Tricholoma magnivelare*) mushrooms and quantify its importance to wildlife. Examine the fungus’ response to environmental conditions such as temperature, moisture, soil type, and duff thickness. Assess the impact of illegal collection by humans on the mushroom’s productivity and persistence.

- The Final Recovery Plan for the endangered western lily (Guerrant et al. 1998) recommends that research be conducted to: determine patterns of genetic diversity, vegetation control methods, genetic studies, the effects of small and large mammal grazing, insect herbivory, and microbial rot control measures, and demography studies.

- The Final Conservation Strategy for the pink sand-verbena (USDI et al. 2004) recommends that research be conducted on: pathogens and herbivores, plant taxonomy, European beach grass control, population augmentation and reintroduction of additional species native to Oregon beaches and dunes, and population modeling.

Fisheries

- Conduct a comprehensive study of Chinook and coho salmon life history in the New River basin, including out-migration timing, size and growth, and limiting habitat factors.

- Examine the thermal tolerance of New River Chinook salmon. Healthy Chinook salmon smolts have been seined in water that exceeded their theoretical critical thermal maximum.

- Collect genetic (electrophoresis) data on New River Chinook salmon in conjunction with the thermal tolerance study.

- Determine the abundance and distribution of benthic and aquatic invertebrate species in New River, and assess their relative importance to the aquatic food web (minimum two-year study).

- Determine the status and extent of exotic fish in New River and its tributary streams and lakes.

- Compile historical accounts of the activities, fish runs, usage, etc., from long-time local residents and documents available through local libraries and courthouses.

Geology

- Develop a sand movement monitoring plan to determine the effects of the on-going coastal dune restoration project on the foredune and New River. The goal of this restoration project is to remove invasive European beach grass to bring back the historic open sand dune ecosystem.

- Determine if the 50-foot wide buffer of European beach grass established along the east side of the foredune is adequate to maintain a balance between restored open sand habitat and the stability of the New River system. This can be initiated by monitoring of current conditions, as well as establishing varied buffer widths at key locations using European beach grass and/or native plant species with concurrent monitoring.

Hydrology

- Study concurrent adjustments of New River base level, sediment supply, flow, width and depth and other variables in an effort to determine how far north the river mouth will continue to move.

- Define aquatic habitat requirements and identify the stream flows needed to maintain this aquatic habitat. Data will be used to obtain an in-stream flow water right for New River.

- Study the effects that the drawdown rate of near-surface freshwater aquifers for agricultural uses has on surface flow in New River, and the risks of diminishing flow in New River during the summer/fall.

- Evaluate ground water distribution in the New River area relative to coastal dune aquifers.

- Determine what flow levels and duration, in balance with other interrelated hydrologic variables, are necessary to maintain the New River channel.

- Study the effect that a closed mouth with a rapid fall/early winter breakout has on stream function.

- Study the effects of mechanical breaching on New River's width and depth, stability of a continuous river system, and on the estuarine zone.

- Estimate the amount of water storage that can be achieved by improving/developing side-channel riparian/wetland areas.

Wildlife

- Identify limiting factors (i.e., nesting locations, clean water, foraging areas, etc.) and what levels of these limiting factors affect species use of habitats within the ACEC. This may be used to identify hazards or overuse conflicts.

- Research a variety of factors pertaining to Western Snowy Plover biology to better understand recovery needs. Evaluate management strategies to provide the most effective measures to meet recovery goals. Better understand and document human and natural disturbance effects on breeding plovers in the New River area.

- Survey migratory shorebirds and waterfowl in both the spring and fall to better understand the importance of the area and establish baseline information to monitor trend.

Coordination and Cooperation

Objective 9 – Facilitate cooperative management of the New River area to better protect resource values through coordination and collaboration with others.

Reasons for Action

Supporters of BLM's efforts at New River include a variety of state and federal agencies, federally-recognized Native American tribes, county governments, non-profit organizations, institutions, local residents, and adjacent landowners. Without such allies, BLM would have a difficult time garnering support to protect an ecosystem that extends across such a complex pattern of ownerships and jurisdictions. Because of this, it is critical that BLM continues to strengthen existing relationships while pursuing new opportunities for collaboration.

Planned Actions

- Promote ongoing coordination efforts by encouraging establishment of a "Friends of New River" volunteer citizen group.

- Ensure communication by maintaining an updated mailing list of adjacent landowners and people interested in New River management.

- Consult with ODFW pertaining to hunting and fishing regulations. Communicate evidence of overuse to ODFW for them to consider adjustments in current regulations. Coordinate with ODFW on general wildlife management, share information, and partner on habitat restoration work when feasible.

- Coordinate with OPRD, the state agency responsible for managing the ocean shore, regarding issues such as the recovery of threatened species, the Oregon Coast Trail, and illegal OHV use.

- Cooperate with the Snowy Plover Working Team to provide management consistency, share workloads, and leverage funds.

Actions Accomplished or On-going

General

The BLM will continue to coordinate with the following agencies, groups, institutions, and individuals (listed alphabetically with a short description of their involvement at New River):

- *Adjacent landowners* – Collaborate with BLM on land management issues in a way that ensures protection of resource values while maintaining private property rights. See Cooperative Management Agreements below.

- *Berry Botanic Garden* – Monitors an *ex situ* population of the western lily, and carries out seed and bulb collection for the seed bank.

- *Citizens* – Engage citizens who express an interest in New River to assist with projects and other opportunities within the ACEC.

- *Coos and Curry County* – Provide the connection and support between county programs and the BLM. See Cooperative Management Agreements below.

- *Coos and Curry County Sheriff Departments*. – Provide law enforcement support.

- *Coquille Indian Tribe and the Confederated Tribes of Siletz Indians of Oregon* – Protect the cultural heritage of the Native American groups with interests in the New River area.

- *Coquille and South Coast Watershed Associations* – Assist with the development and implementation of restoration projects on BLM and adjacent private lands.

- *Department of Land Conservation and Development (DLCD)* – Coordinates coastal programs and monitors for federal consistency in plans.

- *Institute of Applied Ecology* – Monitors, collects, and distributes pink sand-verbena seeds at New River as part of a Challenge Cost Share project with the BLM.

- *National Marine Fisheries Service (NMFS*) – Coordinates marine mammal protection and ocean fisheries management.

- *National Fish & Wildlife Foundation* – Provides funding for outreach efforts. Recently funded an audiovisual presentation about the coastal sand dune ecosystem.

- *Oregon Coast Wetlands Joint Venture* – Lobbies and raises funds for federal wetland acquisition.

- *Oregon Department of Agriculture* – In charge of plant species listed under the Oregon Endangered Species Act and controlling noxious weeds. Involved with study of Wolf's evening-primrose and seaside gilia at New River.

- *Oregon Department of Environmental Quality (DEQ*) – Monitors water quality and pollution control.
- *Oregon Department of Fish and Wildlife (ODFW)* – Manages and regulates animal populations.
- *Oregon Department of Geology and Mineral Industries (DOGAMI)* – Monitors changes in beach morphology.
- *Oregon Department of Transportation (ODOT*) – Responsible for highway safety and directional signs to New River.
- *Oregon Division of State Lands (ODSL)* – Manages the state-owned seabed (up to three miles offshore) and regulates fill and removal up to the ordinary high tide line.
- *Oregon State Marine Board (OSMB*) – Regulates recreational water use and safety and the licensing of guides and outfitters for the State of Oregon.
- *Oregon Parks and Recreation Department (OPRD)* – Manages the "wet sand" area up to the ordinary high tide line with ODSL, and has jurisdiction of the "dry sand" up to the statutory vegetation line on state, county, and private lands. Manages the Oregon Coast Beach Trail.
- *Oregon State Police* – Provides enforcement of fish and wildlife laws and all other laws for the State of Oregon.
- *Oregon State University* – Conducts research on the Wolf's evening-primrose and seaside gilia at New River.
- *Oregon/Washington Snowy Plover Working Team* – A consortium of agencies involved in the recovery of the Western Snowy Plover, established by the draft Western Snowy Plover Recovery Plan. Involved agencies include: BLM, USFS, USFWS, APHIS, ODFW, OPRD, and the Oregon Natural Heritage Information Center.
- *Point Reyes Bird Observatory* – Monitors and evaluates shorebird populations in Western U.S.
- *Queen's University, Canada* – Conducts research on the pink sand-verbena.
- *Shoreline Education for Awareness* (SEA) – Assists with interpretive and educational opportunities with the help of their volunteer docents.
- *The Audubon Society, Defenders of Wildlife, Ducks Unlimited, and other environmental groups* – Encourage the protection of habitats and species.
- *The Nature Conservancy (TNC)* – Assists with establishing conservation easements and executing acquisitions from willing sellers.
- *U.S. Army Corps of Engineers* – Regulates fill and sand removal (from the foredune).
- *U.S. Fish and Wildlife Service (USFWS)* – Provides mandatory consultation on Endangered Species Act compliance.

Cooperative Management Agreements

BLM has entered into four cooperative agreements with adjacent private landowners and Curry County to better protect riparian, wetland, and coastal dune habitats adjacent to New River.

Cooperative Management Agreements between the BLM and Adjacent Ranchers

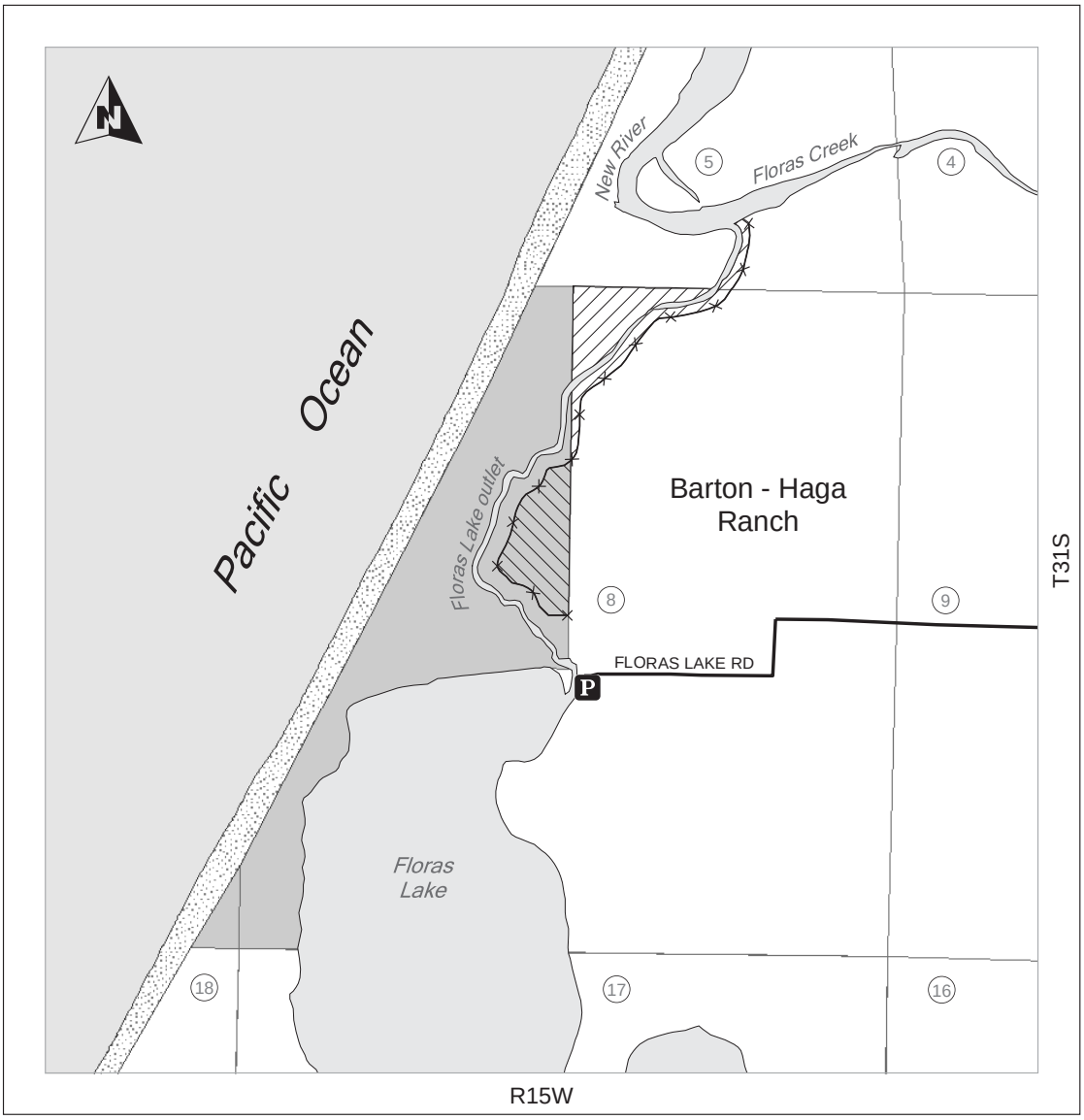
Three cooperative agreements were entered into by the BLM and ranchers adjacent to the New River ACEC. The purpose of these agreements is to adjust livestock grazing practices in order to better protect sensitive riparian and wetland habitats along New River and Floras Lake outlet.

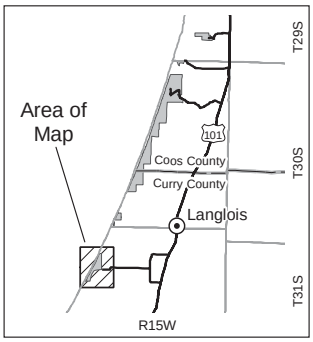
Private ranchers and the BLM own portions of land on both the east and west sides of New River and Floras Lake outlet. Over the years, livestock grazing has occurred regularly along the riparian zone of these waterways on the private ranches. As well, BLM authorized a limited amount of livestock grazing in the ACEC along the river through seasonal grazing leases.

Due to the increasing need to better protect habitats along New River for threatened species, cooperative agreements were established in place of grazing leases to exclude livestock from grazing the riparian zone of the river on portions of private ranch lands and within the ACEC. In exchange for limiting livestock grazing along the river on private lands, the BLM is allowing grazing to occur within the ACEC on designated portions located away from the river corridor. To accomplish this goal, approximately four and a half miles of riparian fence has been constructed across BLM and private property under these new cooperative agreements.

The following maps show the location of these agreements with Barton/Haga, Knapp, and Kamph. McKenzie's grazing lease (allotment 367207) with the BLM near New Lake outlet was cancelled; however, a cooperative management agreement was not developed in its place. Instead, a cooperative rangeland improvement agreement was established to maintain fence lines between the BLM and McKenzie's property to ensure that livestock do not trespass within the ACEC.

Newly installed riparian fence along New River to exclude livestock from grazing along the river banks.





Location Map

Legend

- # Section Number
- P Parking Area
- Fence Line
- Primary Road
- Water Body
- State-owned Beach Zone 'Wet Sand'
- Grazing Not Allowed on Private Land
- Grazing Allowed on BLM Land Within ACEC
- New River ACEC BLM Administered Land

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Coos Bay District Office
Myrtlewood Resource Area

New River ACEC

0 800 1,600 2,400
Feet

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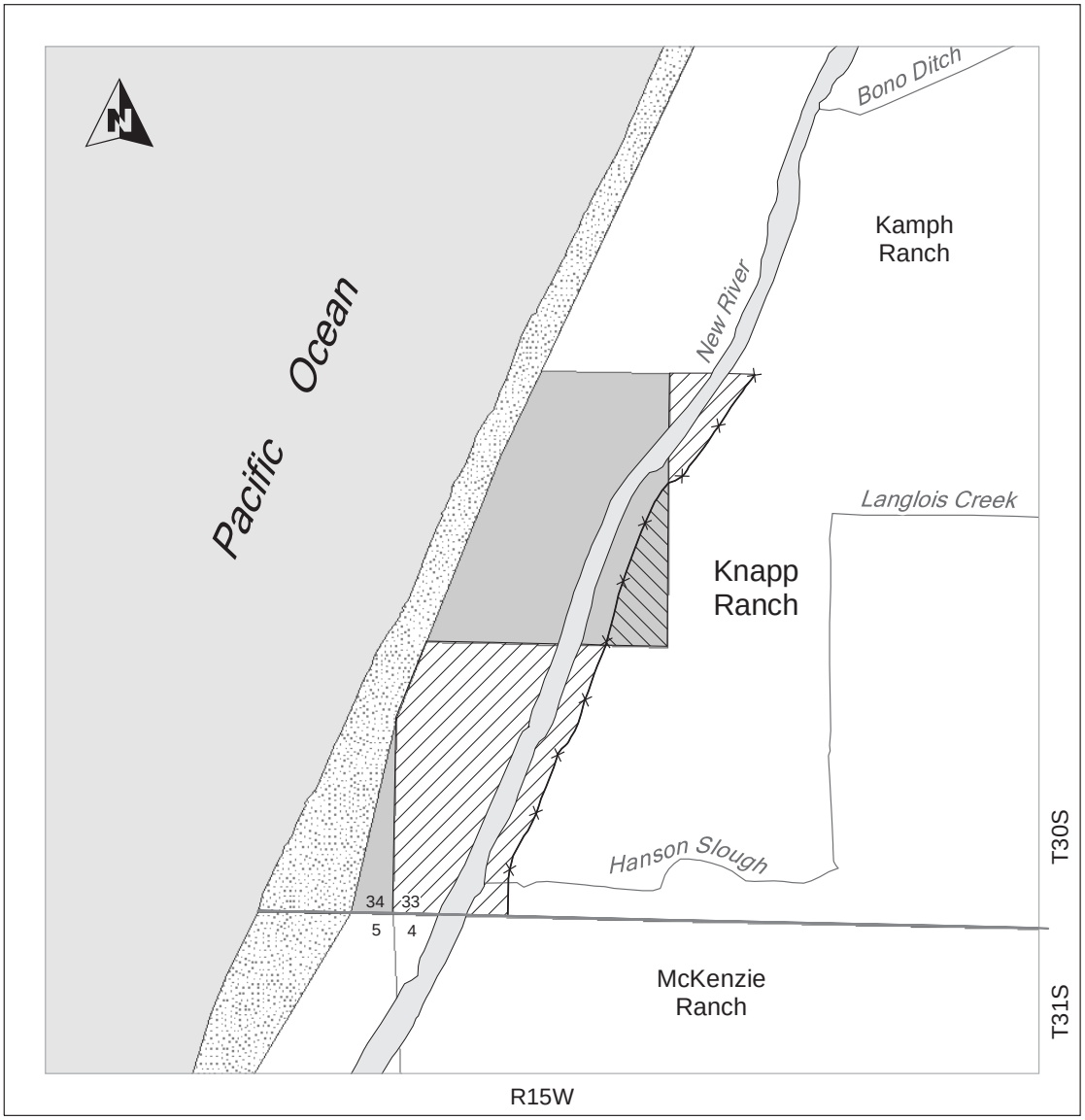
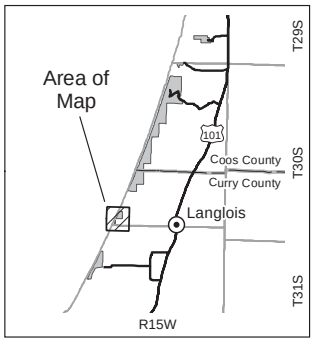
Map 10: BLM-Barton-Haga Cooperative Management Area





Location Map

Legend

- Stream
- Fence Line
- Water Body
- State-owned Beach Zone 'Wet Sand'
- Grazing Not Allowed on Private Land
- Grazing Allowed on BLM Land Within ACEC
- New River ACEC BLM Administered Land

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Coos Bay District Office
Myrtlewood Resource Area
New River ACEC

0 500 1,000 1,500
Feet

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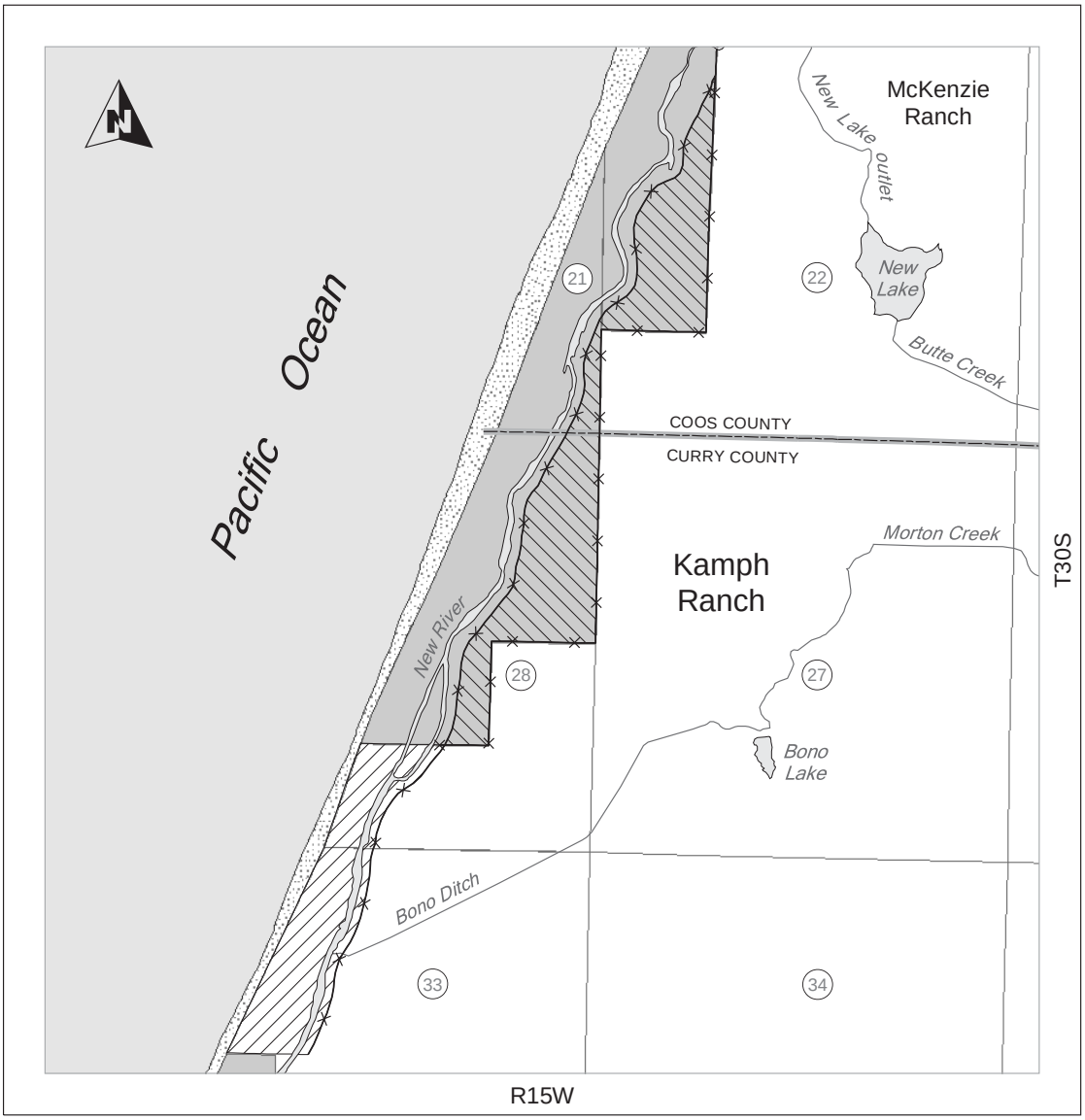
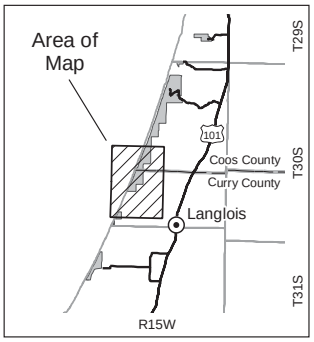
Map 11: BLM-Knapp Cooperative Management Area





Location Map

Legend

- # Section Number
- Fence Line
- Water Body
- State-owned Beach Zone 'Wet Sand'
- Grazing Not Allowed on Private Land
- Grazing Allowed on BLM Land Within ACEC
- New River ACEC BLM Administered Land

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Coos Bay District Office
Myrtlewood Resource Area

New River ACEC

0 0.25 0.5 0.75
Miles

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Map 12: BLM-Kamph Cooperative Management Area

Cooperative Management Agreement between the BLM and Curry County

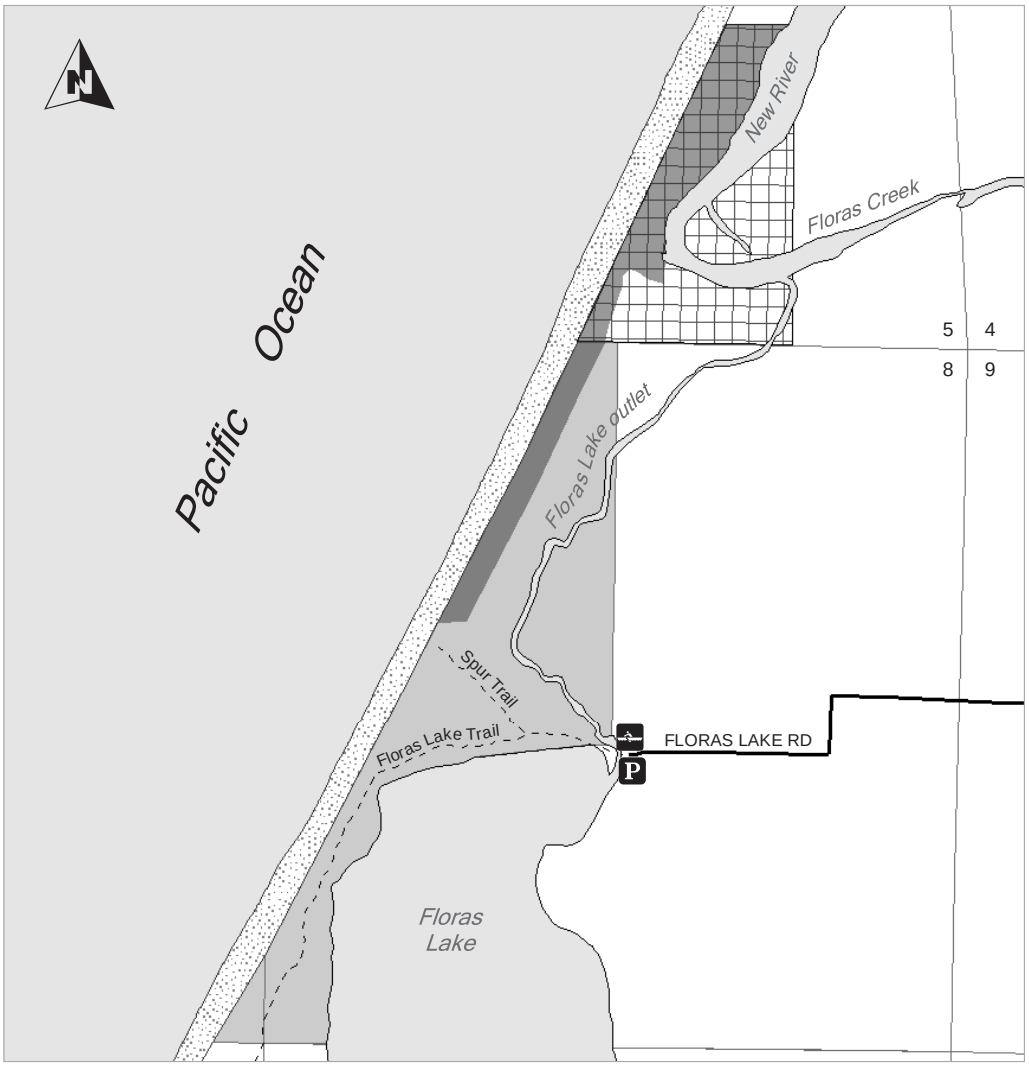
A cooperative management agreement was entered into by the BLM and Curry County to collaborate on management of Western Snowy Plover habitat and public use at Floras Lake. This agreement allows the BLM to open beach restrictions west of Floras Lake during the snowy plover nesting season (March 15 through September 15), in exchange for Curry County to implement a dry sand seasonal restriction on county land located north of Floras Lake.

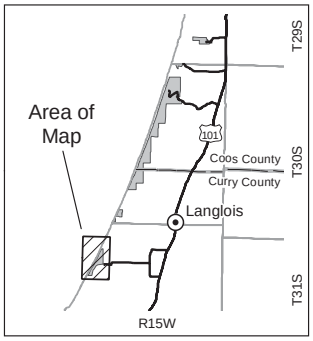
Since the mid to late 1990s, snowy plover use of the Floras Lake beach has declined due to change in beach morphology which has resulted in poor nesting habitat. A dramatic increase in recreational use on and around the lake has also contributed to this situation. No snowy plovers have successfully fledged young on this beach since 1998.

Currently, county lands north of Floras Lake contain higher quality plover habitat. Ocean over-washing, located at the bend in New River on county property, keeps the area relatively free of vegetation, providing ideal nesting habitat for plovers. This area has significantly less recreational use than BLM lands adjacent to the lake, and it is likely that plover nesting success will be greater with the added dry-sand restrictions during the nesting season.

The success of this agreement will be measured in large part by the cooperation of the visiting public to the Floras Lake area. Visitors are asked to observe posted signs during their visit to comply with the new restrictions.

This cooperative management agreement remains flexible in case plovers do choose to nest on BLM lands adjacent to Floras Lake or if habitat conditions change. An adaptive management approach will ensure that plovers are protects for the long-term at this site.





Location Map

Legend

- Parking Area
- Boat Launch
- Trail
- Primary Road
- Water Body
- State-owned Beach Zone 'Wet Sand'
- Snowy Plover Seasonal 'Dry Sand' Restricted Area
- Curry County Administered Land
- New River ACEC BLM Administered Land

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Coos Bay District Office
Myrtlewood Resource Area
New River ACEC

0 800 1,600 2,400
Feet

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Map 13: BLM-Curry County Cooperative Management Area

Acquisition Strategy

Objective 10 – Develop an effective acquisition strategy in collaboration with willing landowners to improve overall protection and public benefit of the New River area.

Reasons for Action

The greater New River ecosystem extends across a complex pattern of federal, state, county, and private ownership. To insure protection of ACEC values that extend beyond the ACEC boundary, an acquisition strategy is needed. A successful strategy needs to include: exchanges, direct purchases, and conservation easements. With a variety of options, the acquisition strategy should be able to adapt to market changes, shifts in public attitudes, funding opportunities, and policy changes.

Planned Actions

- Maintain habitat and enhance recovery efforts for special status species through land tenure adjustments, including: exchanges, direct purchase, and conservation easements.

- Update the acquisition zone to include only those lands that complement the existing public land base and public interest associated with the New River ACEC. The acquisition zone is only designed to identify potential lands that may become available from willing sellers.

- All lands acquired within the acquisition zone will be designated as part of the New River ACEC and managed consistent with its goals and objectives.

- Establish property lines for newly acquired lands through legal surveys to determine the true boundary between private and public lands. Once ownership lines are established, place boundary monuments to identify public lands. When necessary, ensure that private landowners maintain fences to keep livestock from trespassing into the ACEC.

- Develop and implement a conservation easement program that provides resource protection and public benefits.

- Provide written criteria for establishing easements. Written criteria that is based on resource protection and public benefit will assure that BLM is developing easements that serve the public good and can be enforced over the long term.

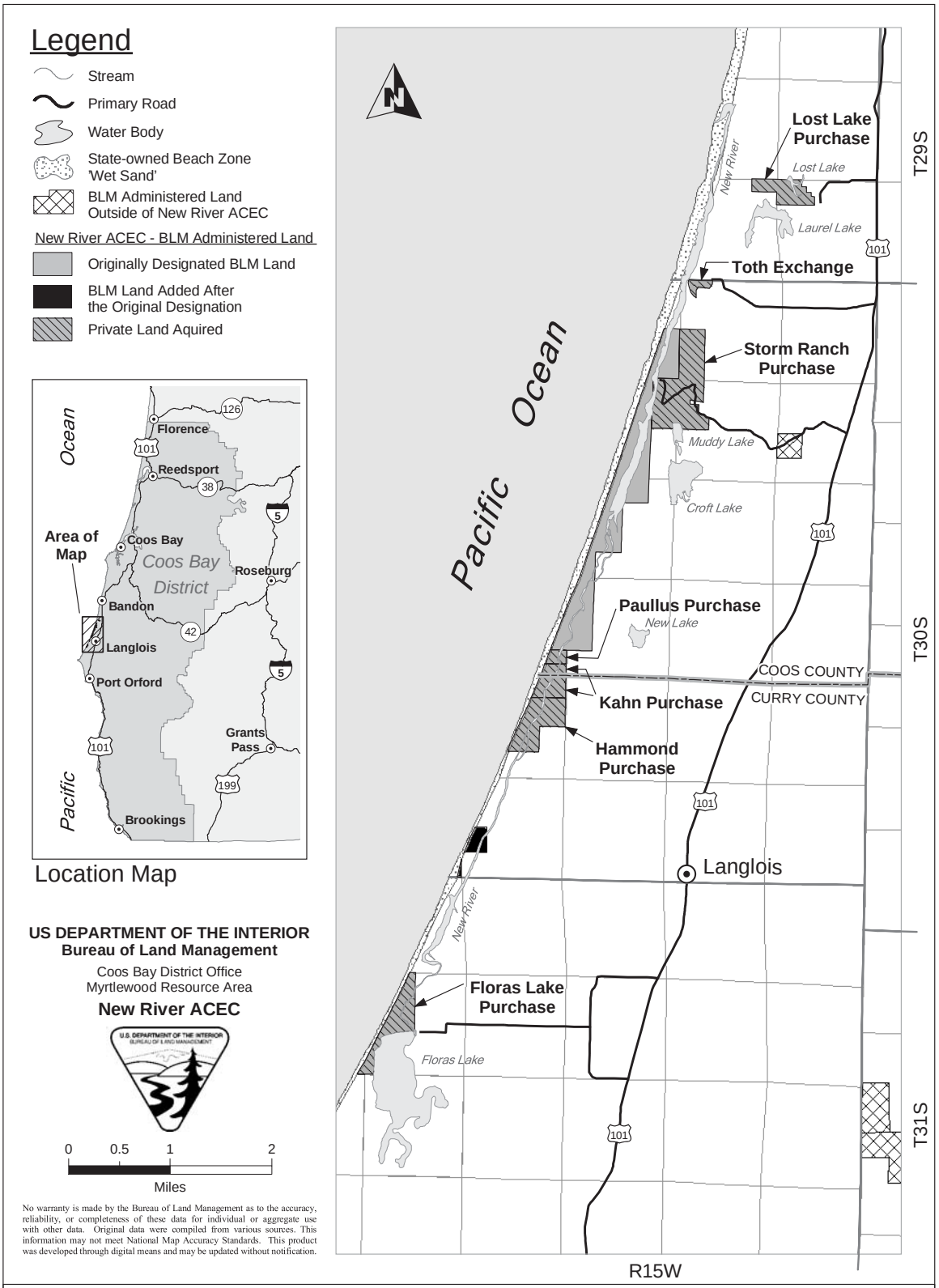
Actions Accomplished or On-going

General

- The original New River ACEC Acquisition Plan, completed in 1989, identified a strip of land along New River which was considered important for the conservation and management of the area's unique natural resources. A coalition of 20 national conservation groups recommended that Congress fund the purchase of private lands within this zone from the Land and Water

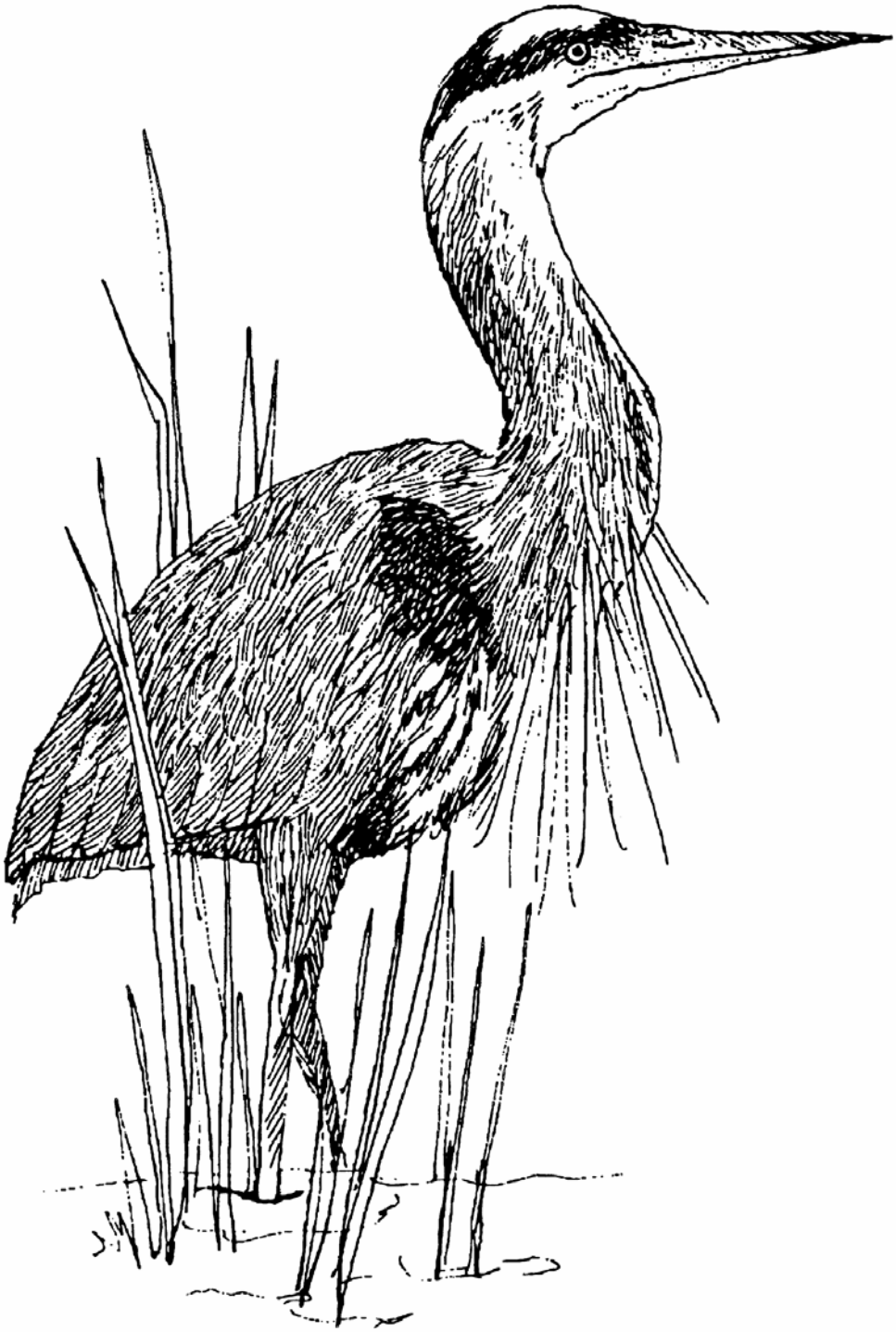
Conservation Fund. These funds were appropriated by Congress and to date seven properties have been acquired, six through purchase and one by land exchange.

- The New River ACEC Acquisition Plan was updated in 1993, to reflect changing market conditions and opportunities. The Coos Bay District, BLM, currently prefers to purchase lands identified in the acquisition zone, but will also consider exchanges, partial title acquisition (conservation easements), and cooperative agreements. Current opportunities for fee acquisitions within the acquisition zone are limited due to unwilling landowners, a deficiency of federal purchase funds, lands suitable for exchange (lands with the same character), and current acquisition policy.



Map 14: Acquisition History

APPENDICES



Appendix A
Chronology of Events at New River

The following information has been gathered from historical documents and journals, newspapers, personal interviews, and BLM record and correspondence files. Some dates are approximations. Prehistoric Native Americans events have not been included in this chronology as sufficient information is not yet available to understand the environmental and cultural changes which have occurred during the last 10,000 years. Native Americans believe they have resided in the area since the beginning of time.

1826 – Alexander McLeod a trapper for the Hudson's Bay Company and his men head south on a journey to explore from the Umpqua to the Rogue River. When he reaches Floras Creek, he writes, "[We] passed a small river named by the natives 'Chiste Etudi.' [We] formed our camp near where our people were lately trapping, on the border of an extensive marsh or swamp." Because of the presence of a considerable outlet from the lake, he was forced to hire Indian canoes to reach the main Indian village on the northeast end of Floras Lake.

1828 – Jedediah Smith and 18 men travel up the beach in front of the deflation plain which would later become New River, on their journey up the Oregon coast as they searched for beaver pelts.

1851, June – John Kirkpatrick and eight men cross the New River country during their escape from an Indian siege at Battle Rock near Port Orford. Kirkpatrick, in describing the area around New Lake, writes "about three o'clock the next day, we came to the edge of what seemed to us a large plain. It looked to be miles in extent, and was covered with a heavy growth of high grass, and proved to be an immense swamp. We now determined to try and cross this swamp and reach the sea after dark and travel all night. We floundered around in this swamp all night, sometimes in water up to our armpits, until after dark we found a little island of about an acre of dry land and covered with a thick growth of small fir bushes. Here we lay down and tried to rest and sleep but encountered a new enemy in the shape of clouds of mosquitoes."

1852 – The U.S. Army establishes a post at Port Orford and begins patrols into the surrounding countryside to control Indian activities. They graze their considerable horse herd on the lush prairies along lower Floras Creek.

1856, Spring – All of the Indian tribes from the Coquille to the Chetco River rebel against the invasion of white settlers and miners into their territory. The settlers stay at a fort in Port Orford until the Indians are defeated by the U.S. Army and deported to a reservation in northern Oregon.

1856 – At the end of the Rogue Indian War, settlers begin taking out donation land claims between Floras Creek and Bandon. The discovery of gold in California creates a tremendous market for farm produce, including cheese and butter, salted beef, and mutton. Farmers haul their goods by wagon to Port Orford or Bandon, where they are loaded on schooners and shipped to San Francisco. Among the earliest settlers were Isham Cox, Chris Long, William Langlois, A.H. Thrift, and Shipman Crouch. Ditching and draining of wetlands begins.

1857 – Daniel and Mathew Murphy, General Land Office surveyors, surveyed portions of the New River area.

1865 – The McClellens establish a ranch at New Lake.

1868 – A tremendous forest fire burns between Port Orford and Bandon, destroying most of the settlers' homes and livestock. The extensive elk herds that once grazed on the Floras Creek river bottoms are almost wiped out.

1873 – William Gallier establishes the New Lake Dairy on the east side of the lake.

1876 – Settlers on lower Floras Creek include the Brocks, Chris Long, William Langlois, William Burris, Jonathan Scott, Edward Burroughs, Al Thrift, and the Burnaps.

1880 – Frank Langlois and A.H. Thrift form a partnership for the establishment of a store on the Langlois farm a mile west of the present town of Langlois.

1880 – The mail route between Bandon and Langlois follows the beach from to near Croft Lake, where it turns inland and follows the ridge bordering the north side of Conner Creek. From this point, it turns south and follows the present course of Highway 101.

1880 – William Wright, a General Land Office surveyor, completed surveys for the New River area.

1881 – A post office is established at Langlois.

1889 – The town of Dairyville (present day Langlois) is platted in 1889 by A.H. Thrift. Thrift's farm is located on the north side of Floras Creek and west of the present town of Langlois. Historian Orville Dodge writes in 1898, "We refer to A.H. Thrift, whose broad acres of rich bottomlands join the town plat and support a hundred cows of improved blood."

1890 – A tremendous flood wipes out some farms along Floras Creek, and the floodwaters flow through the deflation plain north of Floras Lake outlet, prompting local rancher, Louis Knapp Sr., to say that it looks like a new river.

1893 – Starr Dairy, the largest dairy ranch in Curry County, milks up to 150 cows daily. This ranch is located north of Willow Creek.

1897 – Floras Creek and the outlet of Floras Lake join to form a short river that runs north for about one mile and enters the ocean southwest of New Lake. New Lake and surrounding marshes are drained by a short river that enters the ocean northwest of New Lake. Fourmile Creek is the third outlet shown entering the ocean northwest of Croft Lake. Croft Lake is drained by a narrow channel that flows south into New Lake. These streams are connected by a deflation plain extending from north of Floras Lake to Laurel Lake that fills with water each winter. The beach in front of this deflation plain is very flat and is constantly breached in different locations.

1900 – Several families of Native Americans obtain allotments in the hills east of New River, along Fourmile and Floras Creeks. They work part-time for local ranchers.

1900 to 1935 – Each fall, New River is artificially breached by farmers who supplement their income by gillnetting salmon for sale to local canneries. The location of the breach changes often as adjacent landowners compete to see who can get to the salmon first.

1903 – Maps drawn in 1903, 1913, 1932, and 1936, all show New River as a contiguous stream running from Floras Lake to the outlet west of Croft Lake. These maps also show that New River has a second mouth located southwest of New Lake. Through most of the year, Floras Creek and the outlet of Floras Lake flow

through the southern breach, while New Lake drains into the northern breach. The two systems are connected only during periods of high winter runoff. Local residents refer to the outlet of New Lake as New River.

1903 – Wallace Pomeroy homesteads on the southeast side of New Lake.

1911 – Edith Gallier and her family move to the New Lake Dairy. Edith attends school in a one-room schoolhouse at New Lake, where the first eight grades are taught.

1915 – One of the earliest cranberry bogs in the Bandon area is built on the east side of Muddy Lake by Henry Eden and Dr. Roland Leep. The spruce swamp is cleared by hand, and a steam donkey is connected to a haulback to obtain sand from dunes east of New River. These bogs are hand picked by local women who are hired each fall and paid in vouchers that can be redeemed at several Bandon businesses.

1915 – Hans Hansen leases the Starr Ranch, and milks 150 to 175 cows daily. He soon establishes the Langlois Cheese Factory and begins producing blue cheese in 1931. By 1941, the Langlois plant is producing half a million pounds a year.

1917 – Joseph Stankevich, a pioneer cranberry grower in the Croft Lake area, crosses the McFarlin cranberry vine with wild vines from a marsh at New Lake to create the *Stankevich* variety. This variety produces well and is planted in several of the bogs built by Eden and Leep northeast of Muddy Lake.

1930 – European beach grass, first introduced to the Oregon Coast in the 1891, becomes established in the New River area, and a beach ridge begins to form along the coast from Floras Lake to Fourmile Creek.

1920 to 1940 – Farmers attempt to gain new grazing land by draining the marshes south of New Lake. A. H. Thrift is the first rancher to construct a ditch using a steam donkey on a sled. Bono Ditch is created, and Hansen Slough and Langlois Creek are straightened and deepened to drain excess water from shallow lakes and marshes, and to provide additional grazing for the large dairy herds of Joseph Bono and Hans Hansen.

1939 – Shirley Brown acquires a 220-acre ranch at the mouth of Fourmile Creek, which at this time runs due west into the ocean. He operates a dairy and grazes cows in the area from Croft Lake to Twomile Creek.

1939 – The Croft and Muddy Lake property is purchased from Isaac Storm by George Taylor, and the Croft Lake Club is founded.

1940 – Although the beach ridge continues to grow, there are still separate outlets for Floras Creek, New Lake, and Fourmile Creek. A 1939 aerial photograph shows the outlet of Floras Creek to the west of Bono Ditch. The photograph also shows some foredune development near the outlet of New Lake.

1943 – Louis Knapp, Jr., purchases the historic 840-acre Thrift Ranch and begins farming it in 1947.

1945 to 1955 – A popular sport fishery develops in Bono Ditch with trolling for coho salmon. Most of the New River salmon run migrates through New Lake and Bono Ditch into lower Floras Creek. The section of New River west of New Lake carries water only during mid-winter.

1947 – Gerald Kamph purchases the Joseph Bono property south of New Lake and begins ranching.

1950 – The New Lake Gun Club builds a clubhouse on the east side of New Lake. Duck and goose hunting is excellent and is enhanced by planting of grain in fields near the lake.

1950 – Extensive plantings of shore pines are made on the Storm Ranch in an attempt to control shifting sand dunes. The trees begin to spread and cover much of the terrace bordering the east side of New River.

1951 – Lloyd Collins, University of Oregon archaeologist, records a prehistoric site at the ocean entrance of New Lake. He further notes that the shell midden has been "wave-washed and largely destroyed," indicating the site's proximity to the mouth of the river.

1954 – A pronounced foredune covered with driftwood and clumps of beachgrass has developed along New River; and Floras Creek, New River, and Fourmile Creek are combined to form one system, with the outlet northwest of Croft Lake. The river is very shallow with a sandy bottom and supports little vegetation.

1955 to 1976 – Jack and Ruth Storm attempt to wrest a living from the Storm Ranch, which is mostly comprised of shifting sand dunes and swampland. They feed 50 to 100 head of beef cattle, harvest cranberries from the old Westmoor bogs, charge fishermen an access fee, and sell Indian artifacts excavated from several of the village sites located on their property.

1955 to 1976 – An intensive sport fishery develops at the mouth of New River. Local landowner Jack Storm controls access to the fishing, and charges a one to two dollar entrance fee. Several thousand fishermen visit his property each year, and catch large numbers of coho and Chinook salmon and steelhead. He artificially breaches the river each fall in front of his property to control the fishery and to maintain a deep lagoon (10 to 15 feet deep) at the river's mouth. In 1970, the Oregon Fish Commission begins stocking Floras Lake with coho smolts, which greatly enhances the New River fishery.

1960 – The McKenzie family purchases the New Lake Ranch from Fraser and Graham. They continue to maintain Bono ditch south of New Lake. Public access is allowed for hunting and fishing.

1960 – The Croft Lake Club becomes the Croft Lake Association, and is incorporated with Don Farr of Coquille as trustee. Members are encouraged to preserve the natural condition of the area as much as possible.

1961 – The Brown Brothers raise beef cattle on a 500-acre ranch at the mouth of Fourmile Creek. Their cattle range as far north as Twomile Creek. They sell out to the Bussmann family in 1979.

1963 – A major flood occurs at Christmas, inundating much of the farmland around New Lake and lower Floras Creek. New River is artificially breached near Floras Lake to help alleviate the flooding. This was an emergency measure that was not carried out again for several subsequent years, probably because of the influence of Jack Storm.

1964 – The State of Oregon establishes a minimum stream flow of 10 cfs for July and 5 cfs for August and September on lower Floras Creek to protect fishery values. This validates the state's water right and gives them priority over any other rights filed after 1964, but 18 permits established before 1964 are not subject to shutdown regardless of stream flow.

1968 – After renting for several years, Rod McKenzie purchases the Starr Ranch from Buffington and Crook. He receives permission from the state to straighten portions of Floras Creek to clarify property boundaries and decrease flooding problems. Hunters and fishermen are granted access to the Starr Ranch, providing some of the best waterfowl hunting along the coast.

1969 – The Oregon Beach Bill undergoes final revisions and is implemented. This establishes the state's right to a recreational easement west of the vegetation line. Along New River, the easement is determined to be along the east bank of the river.

1970, Winter – Bono Ditch becomes clogged with debris after a flood, and New River begins to increase in size and depth as a result of the increased flow that is diverted away from the ditch.

1973 – BLM District Wildlife Biologist/Recreation Planner, Dick King, prepares a report on New River identifying the outstanding recreational potential of this area. He proposes that the BLM obtain a right-of-way to New River and develop a campground along Croft Lake Lane. Also identified in this report are concerns for the Snowy Plover, which is rapidly declining in number.

1973 – BLM cadastral crews survey New River and set property corners for the fist time. Some of the federal holdings here are accreted lands that have built up after beachgrass stabilized the foredune west of New River.

1973, November – New River is artificially breached at the bend in Floras Creek for the first time since the Christmas flood of 1964. This breaching is unauthorized and provokes a great deal of opposition from local sportsmen and Jack Storm. BLM representatives attend a hearing at Langlois to help resolve the differences between Storm and the newly-organized Floras Creek Water Control District, which is comprised of local ranchers. The BLM adopts a position supporting artificial breaching of the seawall near Hansen Slough between November and December of each year to help alleviate flooding, yet not interfere with the popular fall sport fishery. This artificial breaching continues periodically into the late 1990s.

1977, Spring – Alan Haga and other local landowners construct a "check dam" at the outlet of Floras Lake to maintain the lake level during a severe drought.

1977, July – Jack Storm sells his ranch to Arthur Allen. Allen closes the only access road to New River and discourages any public use of the area.

1977, November – Rod McKenzie offers to grant the BLM an easement across his ranch north of New Lake. Several potential problems are identified during an initial survey of this route, including the high cost of building a road through the New Lake marsh, the potential for disturbing populations of sensitive plants, and the fact that this road would provide access too far south of the desired fishing on the northern part of New River.

1977, December – Federal and state law enforcement personnel arrest Arthur Allen and several accomplices for smuggling 17 million dollars worth of marijuana through the Storm Ranch from a ship anchored offshore.

1978 – The Storm Ranch is purchased by the Wilson sisters, who are members of a popular rock group called Heart. They hire Mike Rainwater as ranch manager and use the ranch to train thoroughbred horses. Several riding trails are developed and used by the Rainwaters and other local residents.

1980 – The BLM adopts a ten-year Management Framework Plan that calls for the designation of New River as an Area of Critical Environmental Concern (ACEC). The plan includes: protection of outstanding wildlife and visual resources, acquisition of an easement to provide access for management and recreational purposes, and protection of sensitive plants from grazing and off-highway vehicle use.

1980, October – BLM lands at New River are closed to off-highway vehicle use to prevent damage to fragile ecosystems, special status and/or sensitive plants and animals, and archaeological sites.

1981, June – Recognizing that enforcement of the OHV closure on BLM lands is impossible when adjacent state lands are open to OHVs, the BLM asks the state to close their lands to the north and south of New River to OHVs. The state begins to study this request.

1981, June – John Christy of The Nature Conservancy completes a botanical survey of New River and the Storm Ranch. He concludes that most of the native plant communities have been badly disturbed by grazing and that the only plant of concern on BLM lands is the silvery phacelia. Other botanical surveys reveal that the river corridor supports an increasing cover of vegetation as it becomes more stabilized.

1981, July – Judith Wickham completes a bird inventory of the New River area for the BLM. She discovers 13 Western Snowy Plover nests, none of which have a successful hatch. Subsequent inventories by the Oregon Department of Fish and Wildlife reveal that New River has either the largest (or second largest behind the North Spit at Coos Bay) breeding population of snowy plovers on the entire Oregon Coast.

1981, Winter – Heavy flooding and high winds precipitate a major move northward by New River. The mouth of New River moves from Storm Ranch to the north of Fourmile Creek. This move is consistent with a gradual northward movement of the river since 1950, when the foredune became more established with European beach grass. The location of the mouth was somewhat consistent during the 1960s and early 1970s when Jack Storm artificially breached the river each fall near the Storm Ranch boat launch. Since Storm sold his ranch, the river is allowed to breach naturally most years, and has slowly carved its way north through the foredune.

1982 – The U.S. Fish and Wildlife Service becomes alarmed at the number of Aleutian Geese that are being killed by hunters each fall near New Lake. They close the New River area to goose hunting and begin monitoring goose migrations each spring and fall.

1982, January – Pan Aero Corporation applies for a permit to construct a wind energy farm on BLM lands at New River. Their application is eventually rejected based on conflicts with special status species and visual resources.

1983, June – BLM lands at New River are designated an ACEC, and development of a management plan is begun.

1983, December – A BLM management plan addressing the need for acquiring access to New River is completed. The preferred route is across a private parcel between Lower Fourmile Road and New River.

1983, November – The State Parks Department informs the BLM of their plans to improve vehicle access to the beach at Bandon State Park, This plan is opposed by the BLM due to its potential to increase unauthorized vehicle use at New River. The plan is subsequently modified to eliminate any improved access.

1984, August – The Oregon Natural Resources Council (ONRC) sends a petition to the Division of State Lands and Department of Transportation asking for a hearing to close all coastal estuaries to OHV use, as well as several specified beaches including New River. This hearing is held at Coos Bay in November. After taking public testimony, the Division of State Lands and State Department of Transportation set up task forces in each coastal county to develop an OHV use plan.

1985, April – A meeting is held with local ranchers Gerald Kamph and Rick McKenzie to address the need for fencing the ACEC. An agreement is reached with Kamph, who finishes fencing the southern boundary of the ACEC by August.

1985, August – While helping Gerald Kamph build the fence at the southern boundary of the ACEC, BLM employees discover that the river has dried up between Hansen Slough and New Lake, causing a

considerable loss of salmon and steelhead smolts. The Kamphs complain that several of their cows have died after drinking brackish water, indicating a possible saltwater incursion into the water table.

1985, August – The Oregon Department of Transportation meets in Coos Bay and considers a recommendation to close the beach from Twomile Creek to New River. Strong opposition from the Coos County Commissioners defers a decision on this matter. The commissioners contend the beach closure would infringe upon the public's right to use the beach.

1985, September – County Watermaster John Drolet is contacted regarding the lack of water in New River and shuts down several irrigators who do not have valid water rights. Early September rains help to alleviate the water shortages.

1986, June – Rick McKenzie signs a cooperative agreement to build a fence along the east side of New River to keep his livestock out of the ACEC. In return for fencing out 26 acres of his own land, McKenzie is allowed to use the ACEC for grazing during the month of August.

1986, September – BLM fishery biologists complete a two-month inventory of New River. They observe that surface flow in portions of New River between Bono ditch and New Lake outlet was often greatly reduced or interrupted for several weeks during late July/August. Reduction in flow can lead to isolation of fish, warming of water temperature, and high fish mortality due to suffocation, stress and predation.

1986, Fall – BLM successfully completes a land exchange for the 14-acre Toth property located on Lower Fourmile Road, which provides public access to New River.

1987, January – Oregon conservation groups make the acquisition of available private lands along New River a top priority, and ask for Land, Water, and Conservation Fund (LWCF) appropriations from Congress.

1987, September – BLM completes the first New River ACEC management plan. The overriding goal of the plan is to provide protection and enhancement of the unique biological and cultural resources that exist on public lands.

1988 – The Division of State Lands and the Army Corps of Engineers become increasingly concerned about draining and ditching of wetlands in the New Lake area. Several warnings are issued to local ranchers regarding the filling of wetlands with ditch spoils.

1989 – BLM completes an Acquisition Plan for the New River ACEC. The plan identifies almost 3,700 acres of private and county lands for potential acquisition.

1989, December – BLM and The Nature Conservancy (TNC) enter into a Memorandum of Understanding in which TNC would assist in the acquisition of private lands and BLM would reimburse TNC at the approved appraised value as the BLM receives LWCF appropriations.

1990 – BLM receives $500,000 from LWCF for acquisitions at New River.

1991 – BLM receives an additional $1,000,000 from LWCF for acquisitions at New River.

1991, June – The Nature Conservancy acquires the 240-acre Storm Ranch and the 105-acre Hammond property along New River.

1991, June – BLM acquires the Storm Ranch and the Hammond property from TNC with appropriated LWCF.

1993 – A sharp increase in cranberry bog development is evident along Highway 101. Development increases in northern Curry and southern Coos counties near New River.

1993, March – The Snowy Plover, a species of concern to the US. Fish and Wildlife Service for the last ten years, is formally declared a threatened species. The beach north from Floras Lake to the mouth of New River, is one of the most important nesting sites for the species on the Oregon Coast.

1993, December – The acquisition plan for the New River ACEC is updated to reflect new market opportunities, changes in property value, and land exchange potentials.

1994 – The first western lily population is discovered at New River. The same year the western lily is listed as endangered under the federal Endangered Species Act.

1994, August – BLM acquires 111 acres at Floras Lake from the Scofield Corporation.

1994 – BLM begins scrutinizing water right applications in the New River basin due to concerns for water quality and quantity in New River. Approximately 70 new water right applications had been filed within the last four years in the New River area.

1994, December – BLM acquires the Lost Lake property from Helen Buck Russell. This property is the northeast most land to be acquired for the New River ACEC project.

1994, December – BLM is invited to participate in the State Water Resources Alternative Dispute Resolution process regarding water right applications in the New River basin.

1995, January – Rancher Mike Knapp receives an emergency permit for flood control from the Oregon Department of Lands to breach New River. This mechanical breach occurs at the southern-most part of New River at the sharp bend in Floras Creek.

1995, April – BLM acquires 25 acres along New River from Norman J. Paullus.

1995, May – BLM acquires 25 acres in Coos County and 54 acres in Curry County along New River from Stephan B. Kahn.

1997, Fall – Berry Botanic Garden plants 760 bulbs and seeds of western lily in an experimental plot at the New River ACEC as part of a recovery effort for this endangered species.

1998, Fall – BLM begins a coastal dune restoration project to remove European beach grass on the foredune west of New River. This project continues each fall, and by 2004, over 200 acres have been restored.

1999, January – The College of Oceanic & Atmospheric Sciences, Oregon State University, and Shoreland Solutions complete as study entitled, "A Study of the New River Spit, Oregon, to Acquire Information Relevant to an Adjustment of the Statutory Vegetation Line." The study addresses the spit's geomorphologic stability and that stability's relevance to encroaching vegetation.

2001, May – BLM dedicates the Learning Center at Storm Ranch in honor of Ellen Warring, a local resident who advocated for the protection of New River.

2002 – BLM completes an environmental assessment regarding livestock management issues along New River. As a result, BLM negotiates the canceling of all grazing allotments within the ACEC and establishes cooperative management agreements in their place. The result of the agreements is the exclusion of livestock grazing along the riparian zone of New River and Floras Lake outlet on both private and public lands. Four and a half miles of riparian fence is installed.

2003, July – A second, naturally occurring western lily population is discovered within the New River ACEC.

2003, September – Pacific Wind Power, LLC, proposes to build a large wind energy farm on the Knapp, Kamph, and Haga Ranches adjacent to New River. Curry County approves a permit to install three 180-foot high meteorological transmission towers to gather one year of data to determine if the area is feasible for such a facility.

2003 to 2004 – BLM completes an environmental assessment regarding the artificial breaching of New River and its impacts on the health of the ecosystem. The assessment determines that mechanical breaching on the southern end of New River leads to excessive sedimentation and drying of the river channel to the north. An alternative breach site is selected north of New Lake outlet on BLM land to provide adequate flood alleviation for the adjacent ranchers while improving the health of the river system. This breach site is mechanically opened in January 2004.

Appendix B
Hydrology of New River

A short description of the current river morphology and processes for New River follows by stream reach from south to north:

Reach 1. Floras Creek to Hanson Slough (river mile 8.5 to 9.5)

The river bed is up to 200 feet wide, straight, and very flat. There is very little riparian vegetation on the bed or banks. Repeated mechanical breaches in this reach have occurred over the years resulting in a low foredune height and loose sand banks. Winter overwashing is common. During 1964 and 1998, the river occasionally breached at the bend in Floras Creek from high runoff. Floodwaters bulk in this reach of river and are temporarily stored in the channel or out-of-bank. The landward side of the river is subject to wave erosion during the winter. A lack of riparian protection in this area has resulted in severe bank erosion.

Reach 2. Hanson Slough to clay island (river mile 7.3 to 8.5)

The river is shallow and narrower, ranging from 50 to 100 feet in width. New River is straight, on a very flat slope, and has some bank stabilization with riparian vegetation (mainly sedge species). The area north of Bono Ditch appears to have an underlying clay material that resists fluvial erosion resulting in a ridge or "high spot" in the river. This material is visible above ground at the northern end of this reach at a point where the river forks around a clay island. Channel drying may occur in this location in the summer. The foredune is higher along this reach of river and cannot be easily overtopped by sea conditions.

Reach 3. Clay island to New Lake outlet (river mile 5.3 to 7.3)

New River along this reach is narrower and meandering with deeper pools and undercut banks. Prolific riparian vegetation composed mainly of sedge species constrains the channel and provides some bank undercutting. The river is trending towards a C5/E5 river (Rosgen 1994). The foredune is relatively high.

Reach 4. New Lake outlet to Storm Ranch boat launch (river mile 3.4 to 5.3)

This reach is meandering with braided channels that lead to a wide, shallow area. Riparian vegetation is common on island braids. Salt and freshwater mix and is classified as inter-tidal. River banks are dominated with European beachgrass and shore pine on the east bank. European beach grass eradication has occurred on the foredune to restore the open sand dune community. This restoration work has created some shifting sands and overwash areas. Foredune height is relatively low.

Reach 5. Storm Ranch boat launch to ocean confluence (river mile 3.4 to 0.0)

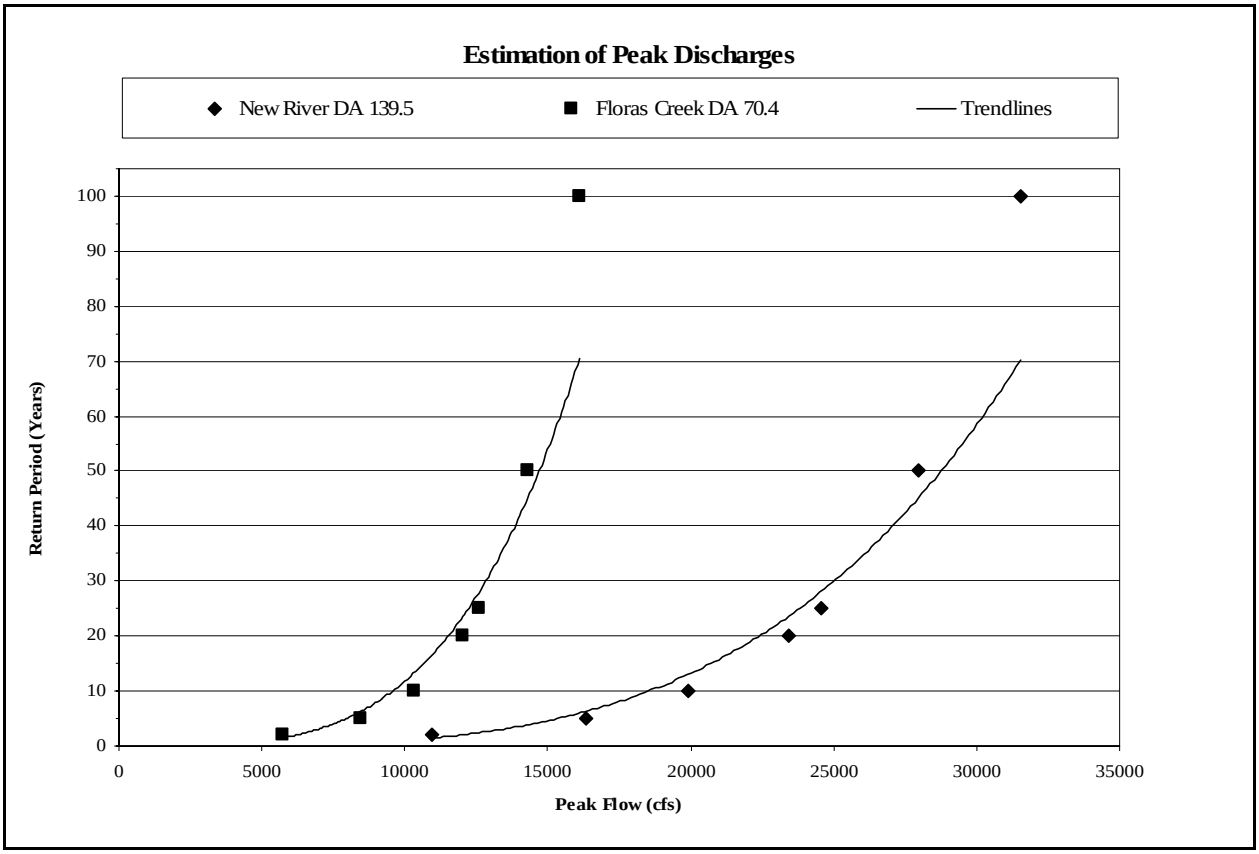
This reach is somewhat narrower. It is constrained by a clay formation along the east bank. There is free tidal exchange from the Pacific Ocean and the water is salty or estuarine, especially near the river mouth. To the north, New River meets south-flowing Twomile Creek and exits on a wide gently sloping dissipative beach. The mouth seems to be relatively stable between years, although it is slowly moving north. In the late summer when flows drop, movement of sand by constant winds (aeolian processes) closes the mouth. Freshwater then backs up in the river until a natural breach re-occurs, usually during an early winter storm.

Hydrodynamics

Winter precipitation patterns and watershed characteristics in this coastal area often result in flashy stream flows. Flows in New River vary according to the winter storm season and the point of flow accumulation (entering tributaries). Peak flow estimates in New River vary from 10,950 cubic feet per second (cfs) for a two year flood event (near bankfull flow) to 31,530 cfs for a 100-year flood event. These flow estimates do not account for losses to floodplain storage or losses through the river bed to the ocean.

Floras Creek provides the major contribution to the southern part of New River. Peak flow estimates range from 5,720 cfs for a two year flood event (near bankfull) to 16,100 cfs for a 100-year flood event. Figure 6 shows the difference in peak discharges between Floras Creek and New River based on the frequency of flood events (return period).

Figure 6. Estimation of Peak Discharges



When New River breaches in the northern portion of the river opposed to the southern end, a great deal of water can be detained in the system over time. A hydrologic analysis along the river in the area of Croft Lake, using channel geometry methods, suggests bankfull river flows are lower than predicted by other regional hydrologic flow estimation techniques (47 cfs per mi^2 compared with 78 cfs per mi^2). This supports the premise that a large amount of water is going into near-surface groundwater storage during high-flow periods.

Figure 7 illustrates stream flow durations for New River and Floras Creek. A stream flow that is equaled or exceeded 50% of the time is referred to as a '50% exceedance stream flow.' This ranges from 27 to 880 cfs for New River and 17 to 351 cfs for Floras Creek. These estimates do not account for groundwater storage or losses.

Figure 7. Stream Flow Duration

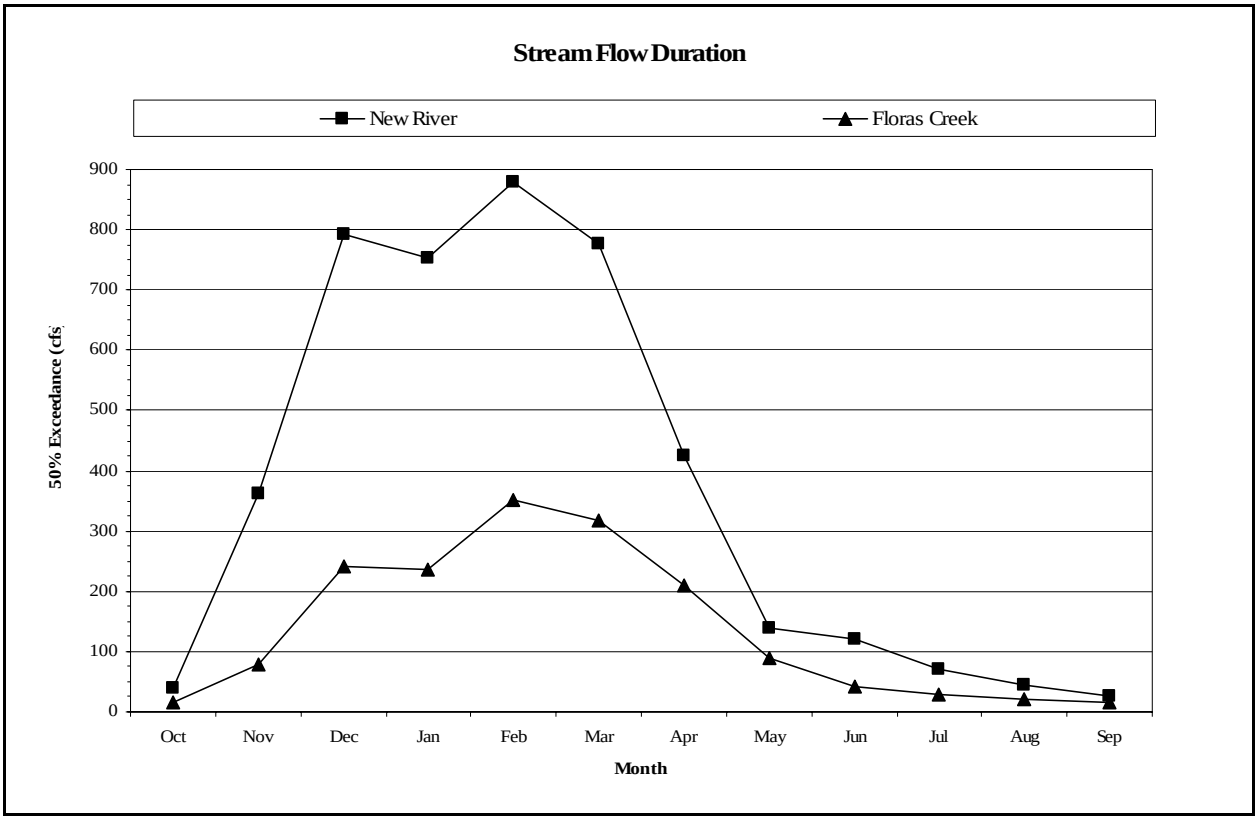
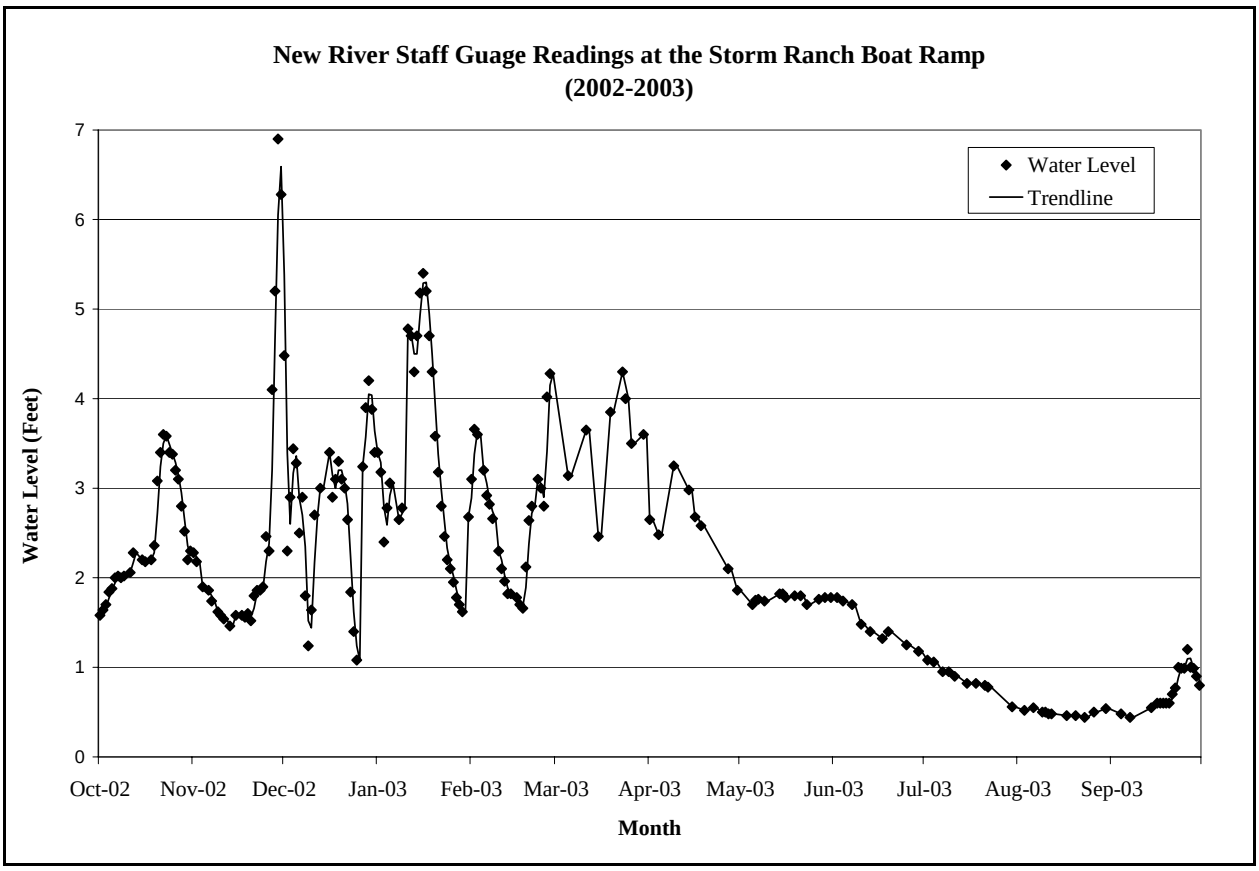


Figure 8 shows New River water levels from October 2002 through September 2003, based on staff gauge readings at the Storm Ranch boat launch. Although not correlated to discharge, the variability in water level and volume is apparent. Late summer to early fall rises in water level indicate the river mouth has closed off from the ocean due to wind-blown sands, which allows for greater storage of water in the system. A rapid decrease in water level in the late fall indicates that the river has breached across the closed mouth to the ocean.

Figure 8. New River Gauge Height Readings



Appendix C
Plant Communities and Species

Plant Communities in the New River Area

The following 22 plant communities of the New River Area were described by Christy (1981). Recent taxonomic changes to scientific names and have been made. Common names follow that of Kartesz (2003) and USDA, NRCS (2003).

1. *Ruppia maritima* (widgeongrass) stands. Aquatic, New River.
2. *Schoenoplectus americanus* (chairmaker's bulrush) mudflats. Edges of New River.
3. *Juncus* sp./*Deschampsia caespitosa/Orthocarpus ambigua* (rush/tufted hairgrass/Johnny-nip) stands. Low herb meadows.
4. *Nuphar polysepalum/Potomogeton natans* (yellow pond lily/floating pondweed) ponds. Aquatic.
5. *Darlingtonia california/Ledum glandulosum/Sphagnum subnitens* or *S. mendocinum* (California pitcherplant/glandular Labrador-tea/sphagnum moss). Mire.
6. *Carex obnupta/Argentina egedii ssp. egedii/Juncus leseuerii* (slough sedge/Pacific silverweed/salt rush). Dune slacks.
7. *Spiraea douglasii/Vaccinium uliginosum/Sphagnum mendocinum* (Douglas' meadow sweet/alpine blueberry/sphagnum moss). Dune slacks, seasonally wet.
8. *Deschampsia caespitosa* (tufted hairgrass) meadow. Seasonally wet.
9. *Alnus rhombifolia/Salix hookeriana/Spiraea douglasii/Carex obnupta* (white alder/coastal willow/Douglas' meadow sweet/slough sedge). Riparian woods.
10. *Pinus contorta/Gaultheria shallon/Carex obnupta* (shore pine/salal/slough sedge). Wet dune swales.
11. *Picea sitchensis* (Sitka spruce) forest. Successional climax.
12. Herb meadow, moist to dry.
13. *Juncus 1eseuerii/Eurhynchium oreganum* (salt rush/ Oregon eurhynchium moss). Dunes swales, early successional, wet phase.
14. *Abronia latifolia/Glehnia littoralis* ssp. *leiocarpa/Cakile edentula* (yellow sand-verbena/American silvertop/American searocket). Primary dune succession.
15. *Ammophila arenaria* (European beach grass) and scant forbs, on stabilizing sand. Early successional.
16. *Juncus leseuerii* (salt rush)/weeds on disturbed sand flats.
17. *Ammophila arenaria/Pinus contorta/Baccharis pilularis* (European beach grass/shore pine/coyotebrush) stabilized sand dunes, early-mid successional.
18. *Pinus contorta/Gaultheria shallon/Vaccinium ovatum* (shore pine/salal/evergreen blueberry) woodland. Canopy moderately open to closed.
19. Dry weedy meadow.
20. *Arctostaphylos uva-ursi* (red barberry) heath.
21. *Pinus contorta* (shore pine) scrub, sometimes cutover, on stabilized sand dunes. Probably a fire climax.
22. Cultivated *Vaccinium macrocarpon* (large cranberry) bogs (presently abandoned).

Plant Species in the New River Area

The plant species list for the New River Area was drawn from many sources (Christy 1981, Zika et al. 1998, BLM 1995b, Coos Bay District Nonvascular Herbarium database, and botany staff survey lists on file at the Coos Bay District). This list includes those documented as well as those suspected to occur. Common names follow that of Kartesz (2003) and the National Plants Database (USDA, NRCS 2003).

Note: * = special status plant species, E = exotic plant, and ncn = no common name.

NON-VASCULAR PLANTS

(lichens, sac fungi, club fungi, liverworts, hornworts, and mosses)

KINGDOM FUNGI

CLASS ASCOMYCETES & DISCOMYCETES (Lichens)
Alectoria imshaugii (Imshaug's witch's hair lichen)
Baeomyces rufus (brown-beret lichen)
Bryoria fuscescens (horsehair lichen)
**Bryoria pseudocapillaris* (horsehair lichen)
**Bryoria spiralifera* (horsehair lichen)
Cavernularia hultenii (Hulten's pitted lichen)
Cavernularia lophyrea (pitted lichen)
Cladina portentosa (reindeer lichen)
Cladina protentosa ssp. *pacifica* (reindeer lichen)
Cladonia cervicornis (cup lichen)
Cladonia chlorophaea (cup lichen)
Cladonia cornuta (cup lichen)
Cladonia furcata (cup lichen)
Cladonia ochrochlora (cup lichen)
Cladonia scabriuscula (cup lichen)
Cladonia subsquamosa (cup lichen)
Cladonia trascendens (transcend cup lichen)
Cladonia umbricola (cup lichen)
Cliostomum griffithii (ncn)
Erioderma sorediatum (ncn)
Graphis sp. (script lichen)
**Heterodermia leucomelos* (shield lichen)
Hypogymnia apinnata (tube lichen)
Hypogymnia enteromorpha (tube lichen)
Hypogymnia heterophylla (tube lichen)
Hypogymnia physodes (tube lichen)
Kaernefeltia californica (=*Centraria californica*, ncn)
**Leioderma sorediatum* (ncn)
Leptogium corniculatum (skin lichen)
Lobaria pulmonaria (lung lichen)
Menegazzia terebrata (honeycomb lichen)
Myloblastus sanguinarius (ncn)
Nephroma laevigatum (kidney lichen)
Nephroma resupinatum (kidney lichen)

**Niebla cephalota* (=*Vermilacinia cephalota*, ncn)
Ochrolechia subpallescens (crabseye lichen)
Parmelia squarrosa (shield lichen)
Parmelia sulcata (shield lichen)
Parmotrema arnoldii (ncn)
Parmotrema chinense (ncn)
Parmotrema crinitum (ncn)
Peltigera aphthosa (felt lichen)
Peltigera brittanica (British felt lichen)
Peltigera cf *polydactylon* (felt lichen)
Peltigera collina (felt lichen)
Peltigera membranacea (membranous felt lichen)
Peltigera ponojensis (felt lichen)
Platismatia herrei (Herre's ragged lichen)
Platismatia norvegica (Norwegian ragged lichen)
Pseudocyphellaria anthrapsis (ncn)
Pyrrhospora quernea (ncn)
Ramalina farinacea (farinose cartilage lichen)
Ramalina menziesii (Menzies' cartilage lichen)
Sphaerophorus globosus (globe ball lichen)
Sticta limbata (spotted felt lichen)
**Sulcaria badia* (ncn)
**Teloschistes flavicans* (ncn)
Tuckermannopsis chlorophylla (=*Cetraria chlorophylla*, ncn)
Tuckermannopsis orbata (=*Cetraria orbata*, ncn)
Usnea diplotypus (beard lichen)
Usnea filipendula (beard lichen)
Usnea substerilis (beard lichen)
Usnea wirthii (Wirth's beard lichen)

CLASS ASCOMYCOTINA (Sac Fungi)
Bisporella citrina (ncn)
Otidea leporina (rabbit's ears)

CLASS HYMENOMYCETES & GASTEROMYCETES (Club Fungi)
Agaricus sequoiae (ncn)
Amanita franchetii (yellow-veiled amanita)
Amanita gemmata (gemmed amanita)
Amanita muscaria (fly agaric, fly amanita)
Boletopsis subsquamosus group
Boletus edulis (king bolete, cep, steinpilz, porcini)
Calocera cornea (staghorn jelly fungus)
Cantharellus cibarius (chanterelle)
Chroogomphus vinicolor (pine spike)
Clavulina cinerea (ashy coral mushroom)
Clavulina cristata (ncn)
Clitopilius prunulus (sweatbread mushroom)
Coprinus comatus (shaggy mane)
Coprinus micaceus group (mica cap)
Cortinarius cotoneus (scaly cortinatius)
Cortinarius mucosus (ncn)

Cortinarius phoeniceus var. *occidentalis* (ncn)
Craterellus tubaeformis (yellow foot)
Cystoderma fallax (ncn)
Dermocybe cinnamonea group (ncn)
Dermocybe sanguineus (ncn)
Hydnellum scrobiculatum var. *zonatum* (bleeding tooth fungus)
Hygrocybe conica (witches' hat)
Hygrophoropsis aurantiaca (false chanterelle)
Hypholoma fasciculare (sulphur tuft)
Laccaria laccata (lackluster laccaria)
Lactarius deliciosus (milky cap)
Leccinum manzanitae (manzanita cap)
Leucoagaricus rubrotinctus (smooth parasol mushroom)
Lycoperdon perlatum (puffball)
Lyophyllum smitale group (ncn)
Mycena aurantiiomarsinata (ncn)
Mycena murina (yet another mycena)
Mycena pura (ncn)
Nolanea sp. (orange unicorn mushroom)
Phaeoleus schweinitzii (dyers polypore)
Phellodon melaleucus (ncn)
Rhizopogon occidentalis (ncn)
Rhodocollybia butyracea (buttery collybia)
Russula cremoricolor (creamy russula)
Russula fragilis (fragile russula)
Russula sanguinea (rosy russula)
Russula sororia (= *R. amoenolens*, comb russula)
Stereum sp. (false turkey tail)
Strobilurus trulisatus (ncn)
Strobilurus trullisatus (ncn)
Suillus brevipes (ncn)
Suillus granulatus (ncn)
Suillus occidentalis (ncn)
Suillus tomentosus (blue-staining slippery jack)
Suillus umbonatus (ncn)
Tricaptum abietinus (ncn)
Tricholoma flavovirens (man on horseback)
Tricholoma focale (armillaria focale)
Tricholoma magnivelare (matsutake)
Tricholoma sejunctum (ncn)
Tricholoma virgatum (ncn)
Xerocomus subtomentosus (boring brown bolete)

DIVISION BRYOPHYTA

CLASS HEPATICOPSIDE (Liverworts)
Calypogeia muelleriana (ncn)
**Calypogeia sphangnicola* (ncn)
Cephalozia bicuspidata ssp. *otaruensis* (ncn)
Cephalozia lunulifolia (ncn)
Cephaloziella divaricata (ncn)

Cephaloziella hampeana (ncn)
Fossombronia foveolata (ncn)
Frullania franciscana (ncn)
Frullania nisquallensis (ncn)
**Kurzia makinoana* (ncn)
Kurzia pauciflora (ncn)
Pellia epiphylla (ncn)
Porella navicularis (ncn)
Radula bolanderi (ncn)
Riccardia chamedryfolia (ncn)
Riccardia latifrons (ncn)

CLASS ANTHOCEROTOPSIDA (Hornworts)
None known at this time.

CLASS MUSCOPSIDA (Mosses)
Drepanocladus oxanolatus (drepanocladus moss)
Eurhynchium oreganum (Oregon eurhynchium moss)
Isothecium stoloniferum (isothecium moss)
Rhizomnium glabrescens (rhizomnium moss)
Sphagnum henryense (Henry's sphagnum moss)
Sphagnum mendocinum (Mendocino sphagnum moss)
Sphagnum subnitens (sphagnum moss)
**Triquetrella californica* (California triquetrella moss)

VASCULAR PLANTS

FERNS AND FERN ALLIES

DENNSTAEDTIACEAE (Bracken Family)
Pteridium aquilinum (northern bracken fern)

DRYOPTERIDACEAE (Wood Fern Family)
Athryium felix-femina (subacrctic lady fern)
Polystichum munitum (pinland sword fern)

BLECHNACEAE (Deer Fern Family)
Blechnum spicant (deer fern)

EQUISETACEAE (Horsetail Family)
Equisetum arvense (field horsetail)
Equisetum telmateia var. *braunii* (giant horsetail)
Equisetum fluviatile (water horsetail)

ISOETACEAE (Quillwort Family)
Isotes tenella (spiny-spore quillwort)

LYCOPODIACEAE (Club Moss Family)
**Lycopodiella inundata* (northern bog clubmoss)

OPHIGLOSSACEAE (Adder's-tongue Family)
Botrychium multifidum (leathery grapefern)

POLYPODIACEAE (Fern Family)
Polypodium glycyrrhiza (licorice fern)
Polypodium scouleri (leather polypody)

GYMNOPERMS

CUPRESSACEAE (Cypress Family)
Chamaecyparirts lawsoniana (Port-Orford-cedar)
Juniperus communis (common juniper)
Thuja plicata (western red cedar)

PINACEAE (Pine Family)
Abies grandis (grand fir)
Picea sitchensis (Sitka spruce)
Pinus contorta var. *contorta* (shore pine)
Pseudotsuga menziesii (Douglas-fir)
Tsuga heterophylla (western hemlock)

DICOTYLEDONS

APIACEAE (Parsley Family)
Angelica hendersonii (Henderson's angelica)
Cicuta douglasii (western water hemlock)
Daucus carota (Queen Anne's-lace) E
Daucus pusillus (American wild carrot)
Glehnia littoralis ssp. *leiocarpa* (American silvertop)
Heracleum maximum (American cow-parsnip)
Hydrocotyle ranunculoides (floating marsh-pennywort)
Hydrocotyle umbellata (many-flower marsh-pennywort)
**Hydrocotyle verticillata* (whorled marsh-pennywort)
Lilaeopsis occidentalis (western grasswort)
Oenanthe sarmentosa (Pacific water-dropwort)
Osmorhiza berteroi (sweetcicely)
Sanicula crassicaulis (Pacific blacksnakeroot)
Sanicula arctopoides (footsteps-of-spring)

AQUIFOLIACEAE (Holly Family)
Ilex aquifolium (English holly) E

ARACEAE (Arum Family)
Lysichiton americanus (yellow-skunk-cabbage)

ARALIACEAE (Ginseng Family)
Hedera helix (English ivy) E

ASTERACEAE (Sunflower Family)
Achillea millefolium (common yarrow)

Ambrosia chamissonis (silver burr ragweed) E
Anaphalis margaritacea (pearly-everlasting)
Anthemis cotula (stinking chamomile) E
Artemisia pycnocephala (beach wormwood)
Baccharis pilularis (coyotebrush)
Bellis perennis (lawndaisy) E
Cirsium arvense (Canadian thistle) E
Cirsium remotifolium ssp. *remotifolium* (fewleaf thistle)
Cirsium vulgare (bull thistle) E
Conzya canadensis (Canadian horseweed)
Corethrogyne filaginifolia var. *californica* (common sand aster)
Cotula coronopifolia (common brassbuttons) E
Crepis capillaries (smooth hawksbeard) E
Erechtites minima (coastal burweed) E
Erigeron glaucus (seaside fleabane)
Gamochaeta purpurea (spoon-leaf purple everlasting)
Gnaphalium uliginosum (marsh cudweed)
Grindelia stricta (Oregon gumweed)
Helenium bolanderi (coastal sneezeweed)
Hesperevax sparsiflora var. *brevifolia* (shortleaf dwarf-cudweed)
Hieracium albiflorum (white-flowered hawkweed)
Hypochaeris radicata (hairy cat's-ear) E
Leontodon taraxacoides ssp. *taraxacoides* (lesser hawkbit) E
Leucanthemm vulgare (oxeye daisy) E
Matricaria discoidea (pineapple-weed)
Micropus californicus (q tips)
Senecio jacobea (tansy ragwort) E
Senecio sylvaticus (woodland ragwort) E
Solidago canadensis var. *salebrosa* (Canada goldenrod)
Sonchus oleraceus (common sow thistle) E
Symphyotrichum chilense (Pacific American-aster)
Symphyotrichum subspicatum (Douglas aster)
Tanacetum camphoratum (camphor tansy) E
Taraxacum officinale (common dandelion) E

BERBERIDACEAE (Barberry Family)
Mahonia aquifolium (holly-leaf Oregon-grape)
Mahonia nervosa (Cascade Oregon-grape)

BETULACEAE (Birch Family)
Alnus rhombifolia (white alder)
Alnus rubra (red alder)
Corylus cornuta (beaked hazelnut)

BORAGINACEAE (Borage Family)
**Cryptantha leiocarpa* (seaside cryptantha)
Myosotis discolor (yellow scorpion-grass)
Myosotis laxa (bay forget-me-not)
Symphytum asperum (prickly comfrey) E

BRASSICACEAE (Mustard Family)

Brassica rapa var. *rapa* (rape) E
Cakile edentula (American searocket) E
Cakile maritima (European searocket) E
Capsella bursa-pastoris (shepherd's-purse) E
Cardamine occidentalis (big western bittercress)
Raphanus sativus (radish) E
Sisymbrium officinale (hedge-mustard)

CABOMBACEAE (Water-shield Family)
Brasenia schreberi (watershield)

CALLITRICHEACEAE (Water-starwort Family)
Callitriche hermaphroditica (autumn water-starwort)
Callitriche stagnalis (pond water-starwort)

CAPRIFOLIACEAE (Honeysuckle Family)
Lonicera hispidula (pink honeysuckle)
Lonicera involucrata (four-line honeysuckle or twinberry)

CARYOPHYLLACEAE (Pink Family)
Cardionema ramosissimum (sand carpet)
Cerastium arvense (field mouse-ear chickweed) E
Cerastium glomeratum (sticky chickweed) E
Lychnis coronaria (rose campion) E
Sagina decumbens ssp. *occidentalis* (western pearlwort)
Silene gallica (windmill-pink) E
Silene scouleri (simple catchfly)
Spergularia rubra (red sand spurry) E
Stellaria calycantha (northern starwort)

CERATOPHYLLACEAE (Hornwort Family)
Ceratophyllum demersum (coon's tail)

CHENOPODIACEAE (Goosefoot Family)
**Atriplex leucophylla* (beach saltbush)
Atriplex patula (halberd-leaf orache)
Chenopodum ambroisioides (Mexican-tea) E

CLUSIACEAE (Mangosteen Family)
Hypericum anagalioides (tinker's penny)
Hypericum boreale (northern St. John's wort)
Hypericum X *moserianum* (gold flower)

CONVOLVULACEAE (Morning-glory Family)
Calystegia soldanella (seashore false bindweed)

CUSCUTACEAE (Dodder Family)
Cuscuta salina var. *major* (goldenthread)

DROSERACEAE (Sundew Family)
Drosera rotundifolia (round-leaf sundew)

EMPETRACEAE (Crowberry Family)
Empetrum nigrum (black crowberry)

ERICACEAE (Heath Family)
Arbutus menziesii (Pacific madrone)
Arctostaphylos columbiana (bristly manzanita)
Arctostaphylos glandulosa (Eastwood's manzanita)
Arctostaphylos patula (green-leaf manzanita)
Arctostaphylos uva-ursi (red barberry)
Arctostaphylos X *parviflora* (pro sp.)
Gaultheria shallon (salal)
Ledum glandulosum (glandular Labrador-tea)
Rhododendron macrophyllum (California rhododendron)
Rhododendron occidentale (western azalea)
Vaccinim uliginosum (alpine blueberry)
Vaccinium macrocarpon (large cranberry)
Vaccinium ovatum (evergreen blueberry)
Vaccinium parvifolium (red blueberry)

FABACEAE (Pea Family)
Acacia dealbata (silver wattle) E
Cytisus scoparius (Scotch broom) E
Genista monspessulana (French broom) E
Lathryus latifolius (everlasting pea) E
Lathyrus japonicus (sea vetchling)
Lotus corniculatus (garden bird's-foot-trefoil)
Lotus formosissimus (seaside bird's-foot-trefoil)
Lotus unifoliolatus var. *unifoliolatus* (American bird's-foot-trefoil)
Lupinus littorallis (Chinook lupine)
Melilotus officinalis (yellow sweet-clover)
Trifolium dubium (suckling clover) E
Trifolium repens (white clover) E
Trifolium wormskjoldii (cows clover)
Ulex europaeus (common gorse) E
Vicia nigricans ssp. *gigantea* (black vetch)
Vicia sativa (garden vetch)

FUMARIACEAE (Fumitory Family)
Dicentra formosa (Pacific bleeding heart)

GARRYACEAE (Silk-tassel Family)
Garrya elliptica (wavy-leaf sikltassel)

GENTIANACEAE (Gentian Family)
Centaurium erythraea (European centaury) E
**Cicendia quadrangularis* (Oregon timwort)
Gentiana sceptrum (king's-scepter gentian)

GERANIACEAE (Geranium Family)
Erodium cicutarium (red-stem stork's-bill) E

Geranium dissectum (cut-leaf crane's-bill) E

GROSSULARIACEAE (Currant Family)
Ribes sanguineum (blood currant)

HYDROPHYLLACEAE (Waterleaf Family)
**Phacelia argentea* (silvery phacelia, sand-dune scorpion weed)

LAMIACEAE (Mint Family)
Clinopodium douglasii (yerba buena)
Lamium purpureum (red henbit)
Mentha arvensis (wild mind)
Mentha pulegium (pennyroyal) E
Prunella vulgaris (common selfheal)

LAURACEAE (Laurel Family)
Umbellularia californica (California-laurel or myrtlewood)

LENTIBULARIACEAE (Bladder-wort Family)
**Utricularia gibba* (humped bladderwort)
Utricularia macrorhiza (greater bladderwort)

LINACEAE (Flax Family)
Linum bienne (pale flax) E

MENYANTHACEAE (Buckbean Family)
Menyanthes trifoliata (buck-bean)

MYRICACEAE (Sweet Gale Family)
Morella californica (Pacific bayberry)

NYCTAGINACEAE (Four-O'clock Family)
**Abronia latifolia* (yellow sand-verbena)
**Abronia umbellata var. breviflora* (pink sand-verbena)

NYMPHAEACEAE (Water-lily Family)
Nuphar lutea ssp. *polysepala* (yellow pond-lily)

ONAGRACEAE (Evening-primrose Family)
Camissonia cheiranthifolia (beach suncup)
Epilobium ciliatum ssp. *watsonii* (fringed willowherb)
Oenothera glazioviana (red-sepal evening-primrose) E

OROBANCHEACEAE (Broom-rape Family)
Boschniakia strobilacea (California groundcone)
Boschniakia hookeri (Vancouver groundcone)

PAPAVERACEAE (Poppy Family)
Platystemon californicus (California creamcups)

PLANTAGINACEAE (Plantain Family)

Plantago coronopus (buckhorn plantain) E
Plantago erecta (dotseed plantain)
Plantago lanceolata (English plantain) E
Plantago major (great plantain) E
Plantago maritima var. *juncoides* (goosetongue)
Plantago subnuda (tall coastal plantain)

PLUMBAGINACEAE (Leadwort Family)
Armeria maritima ssp. *californica* (sea thrift)

POLEMONIACEAE (Phlox Family)
Gilia capitata (blue-head gily-flower)
**Gilia millefoliata* (seaside gilia)
Linanthus bicolor (desert-trumpets)
Navarretia squarrosa (skunk weed)

POLYGONACEAE (Buckwheat Family)
Polygonum hydropiperoides (swamp smartweed)
Polygonum paronchyia (beach knotweed)
Rumex acetosella (common sheep sorrel) E
Rumex aquaticus var. *fenustratus* (western dock)
Rumex conglomeratus (clustered dock) E
Rumex crispus (curly dock) E
Rumex maritimus (golden dock) E
Rumex salicifolius (willow dock)

PORTULACEAE (Purslane Family)
Calandrinia ciliata (fringed redmaids)
Claytonia exigua ssp. *exigua* (serpentine springbeauty)
Claytonia sibirica var. *sibirica* (Siberian springbeauty)

POTOMOGETONACEAE (Pondweed Family)
Potamogeton epihydrus (ribbonleaf pondweed)
Potamogeton pusillus ssp. *tenuissimus* (small pondweed)
Potomogeton natans (floating pondweed)
Potomogeton richardsonii (red-head pondweed)
Stuckenia pectinatus (sago pondweed)

PRIMULACEAE (Primrose Family)
Anagallis minima (chaffweed)
Lysimachia terrestris (swamp candles)
Trientalis borealis ssp. *latifolia* (maystar)
Trientalis europea ssp. *arctica* (Arctic starflower)

RANUNCULACEAE (Buttercup Family)
Ranunculus flammula (greater creeping spearwort)
Ranunculus repens (creeping buttercup) E
Ranunculus uncinatus (woodland buttercup)

RHAMNACEAE (Buckthom Family)
Frangula purshiana (Cascara false buckthorn)

ROSACEAE (Rose Family)
Amelanchier alnifolia (Saskatoon service-berry)
Argentina anserina (silverweed cinquefoil)
Argentina egedii ssp. egedii (Pacific silverweed)
Chaenomeles speciosa (flowering quince, horticultural introduction)
Comarum palustre (purple marshlocks)
Frageria chiloensis (beach strawberry)
Holodiscus discolor (hillside oceanspray)
Malus fusca (Oregon crabapple)
Malus sp. (apple, horticultural introduction)
Rubus armeniacus (Himalayan blackberry) E
Rubus leucodermis (whitebark raspberry)
Rubus parviflorus (western thimble-berry)
Rubus spectabilis (salmon raspberry)
Rubus ursinus (California dewberry)
Sanguisorba officinalis (great burnet)
Spiraea douglasii (Douglas' meadow sweet)

RUBIACEAE (Madder Family)
Galium aparine (sticky-willy)
Galium trifidum ssp. *pacificum* (three-petal bedstraw)
Galium triflorum (fragrant bedstraw)

RUPPIACEAE (Ditch-grass Family)
Ruppia maritima (widgeongrass)

SALICACEAE (Willow Family)
Salix hookeriana (coastal willow)
Salix lucida ssp. *lasiandra* (shining willow)
Salix sitchensis (Sitka willow)

SARRACENIACEAE (Pitcher-plant Family)
**Darlingtonia californica* (cobraplant, California pitcher-plant)

SCROPHULARIACEAE (Figwort Family)
Castilleja affinis ssp. *litoralis* (coast Indian paintbrush)
Digitalis purpurea (purple foxglove) E
Gratiola ebracteata (bractless hedgehyssop)
Orthocarpus ambigua ssp. *ambigua* (Johnny-nip)
Parentucellia viscosa (yellow glandweed) E
Synthris reniformis (snowqueen)
Triphysaria eriantha ssp. *eriantha* (Johnny-tuck)
Veronica scutellata (grass-leaf speedwell)

TAXODIACEAE (Bald Cypress Family)
Sequoia sempervirens (coast redwood) [horticultural introduction]

VIOLACEAE (Violet Family)
Viola lanceolata ssp. *lanceolata* (bog white violet)
Viola macloskeyi ssp. *pallens* (smooth white violet)

Viola sempervirens (redwood violet)

MONOCOTYLEDONS

CYPERACEAE (Sedge Family)
Carex aquatilis var. *dives* (Sitka sedge)
Carex brevicaulis (shortstem sedge)
Carex cusickii (Cusick's sedge)
Carex echinata ssp. *phyllomanica* (starsedge)
Carex leptopoda (taperfruit short scale sedge)
Carex lyngbyei (Lyngbye's sedge)
Carex macrocephala (big-head sedge)
Carex obnupta (slough sedge)
Carex pachystachya (chamisso sedge)
Carex pansa (sand-dune sedge)
Carex viridula (little green sedge)
Dulichium arundinaceum (three-way sedge)
Eleocharis acicularis (needle spike-rush)
Eleocharis macrostachya (pale spike-rush)
**Eriophorum chamissonis* (russet cotton-grass)
Isolepis cernua (low bulrush)
Schoenoplectus acutus var. acutus (hardstem bulrush)
Schoenoplectus americanus (chairmaker's bulrush)
**Schoenoplectus subterminalis* (=*Scirpus subterminalis*, water clubrush)
Schoenoplectus tabermaemontani (sofstem bulrush)

HYDROCHARITACEAE (Tape-grass Family)
Egeria densa (Brazilian waterweed) E

IRIDACEAE (Iris Family)
Crocosmia X *crocosmiiflora* (montbretia) E
Iris douglasiana (Mountain iris)
Sisyrinchium bellum (California blue-eyed-grass)
Sisyrinchium californicum (golden blue-eyed-grass)

JUNCACEAE (Rush Family)
Juncus articulatus (jointleaf rush)
Juncus bufonis (toad rush)
Juncus canadensis (Canadian rush)
Juncus effuses (lamp rush)
Juncus ensifolius (swordleaf rush)
Juncus falcatus (sickle-leaf rush)
Juncus leseuerii (salt rush)
Juncus nevadensis (Sierra rush)
Juncus orthophyllus (straightleaf rush)
Juncus planifolius (broadleaf rush)
Juncus supiniformis (hairlyleaf rush)
Luzula comosa (Pacific wood-rush)
Luzula parviflora (small-flower wood-rush)

LEMNACEAE (Duckweed Family)

Lemna minor (common duckweed)

LILIACEAE (Lily Family)
**Brodia terrestris* (dwarf brodiaea)
Calochortus tolmiei (cat's-ears)
Disporum hookeri var. *hookeri* (drops of gold)
Lilium columbianum (Columbian lily)
**Lilium occidentale* (Eureka lily, western lily)
Maianthemum dilatatum (two-leaf false Solomon's seal)
Maianthemum stellatum (starry false lily of the valley)
Tofieldia glutinosa ssp. *glutinosa* (sticky tofieldia)
Trillium ovatum (western wakerobin)
Zigadenus fremontii (Fremont's deathcamus)

ORCHIDACEAE (Orchid Family)
Goodyera oblongifolia (green-leaf rattlesnake-plantain)
Piperia elegans ssp. *elegans* (elegant piperia)
Spiranthes romanzofiana (hooded ladies'-tresses)

POACEAE (Grass Family)
Agrostis capillaris (colonial bent)
Agrostis exarata (spiked bent)
Agrostis stolonifera (spreading bent) E
Aira caryophylla (common silver-hair grass) E
Aira praecox (early silver-hair grass)
Alopecurus geniciulatus (water foxtail)
Ammophila arenaria (European beach grass) E
Anthoxanthum odoratum (sweet vernal grass) E
Briza maxima (greater quaking grass) E
Briza minor (little quakinggrass) E
Bromus carinatus (California brome)
Bromus diandrus (great brome) E
Bromus hordeaceus (soft brome) E
Bromus vulgaris (Columbia brome)
Calamagrostis nutkaensis (Nootka reed grass)
Cortaderia jubata (purple pampas grass) E
Cynosurus cristatus (crested dogstail grass) E
Cynosurus echinatus (bristly dog's-tail grass) E
Danthonia californica (California wild oat grass)
Danthonia decumbens (common heathgrass) E
Deschampsis caespitosa (tufted hairgrass)
Dichanthelium acuminatum var. *fasciculatum* (western panicgrass)
Distichilis spicata (coastal salt grass)
Echinochloa crus-galli (barnyardgrass) E
Festuca occidentalis (western fescue)
Festuca rubra ssp. *mediana* (red fescue)
Festuca subuliflora (crinkle-awn fescue)
Glyceria striata (fowl manna-grass)
Hierochloe occidentalis (California sweetgrass)
Holcus lanatus (common velvet grass) E
Koeleria macrantha (prairie Koeler's grass)

Leymus mollis (American lyme grass)
Lolium arundinaceum (tall fescue) E
Lolium perenne ssp. *multiflorum* (Italian ryegrass) E
Melica geyeri var. *aristulata* (Geyer's oniongrass)
Melica subulata (Alaska oniongrass)
Phalaris arundinacea (reed canary grass) E
Poa annua (annual bluegrass)
Poa confinis (coastline bluegrass)
Poa macrantha (sand-dune blue grass)
Trisetum canescens (tall trisetum)
Vulpia bromoides (brome fescue) E

SPARGANIACEAE (Bur-reed Family)
Sparganium emersum (European burr-reed)

TYPHACEAE (Cat-tail Family)
Typha latifolia (broad-leaf cat-tail)

Appendix D
Wildlife Species

Wildlife inventories are incomplete for the New River area, except for the bird list. Bird observations were compiled by Tim Rodenkirk, BLM Natural Resource Specialist. See Contreras (1998) for more information on the status and distribution of birds in Coos County, Oregon.

Birds

Status:
B – breeding species
M – migrant (usually May-June and August-October)
MS – spring migrant only (usually present May-June)
MF – fall migrant only (usually present August-October)
PB – post breeding migrant (typically present summer-fall)
W – wintering species (normally present in Oct/Nov-April/May)
Y – Year-round resident
O – offshore species occasionally seen from land

Abundance:
C – common to abundant, easily observed in appropriate habitat
FC – fairly common, usually observed in appropriate habitat
U – uncommon, not always observed in appropriate habitat
R – rare, not seen every year
V – vagrant, very rare species with few records
I – irregular, numbers fluctuate year-to-year

Note: * = Probable breeders, (?) = Status is probable, but undocumented

SWANS/GEESE/DUCKS (Family Anatidae)
Tundra Swan (*Cygnus columbianus)* W-U
Greater White-fronted Goose (*Anser albifrons)* MF-U, MS-R
Snow Goose (*Chen caerulescens*) M-R
*Canada Goose (*Branta Canadensis)* Y-C
Aleutian Canada Goose (*Branta canadensis leucopareia)* M-C
Brant *(Branta bernicula*) M-U
*Wood Duck *(Aix sponsa)* B-U, W-R (?)
American Wigeon *(Anas americana)* W-C
Eurasian Wigeon (*Anas penelope)* W-R
Green-winged Teal *(Anas crecca)* W-C
*Mallard *(Anas platyrhynchos*) Y-C
Gadwall *(Anas strepera*) W-FC
Northern Shoveler (*Anas clypeata)* W-FC
Northern Pintail *(Anas acuta*) W-C
Cinnamon Teal *(Anas cyanoptera)* M-U
Blue-winged Teal (*Anas discors)* M-U
Canvasback (*Aythya valisineria)* W-FC
Redhead *(Aythya Americana)* M-U

Ring-necked Duck (*Aythya collaris)* W-C
Greater Scaup *(Aythya marila)* W-C
Lesser Scaup *(Aythya affinis*) W-FC
Long-tailed Duck (*Clangula hyemalis)* W-R
Black Scoter *(Melanitta nigra)* W-U
Surf Scoter *(Melanitta perspicillata)* W-C
White-winged Scoter *(Melanitta fusca)* W-U
Bufflehead *(Bucephala albeola)* W-C
Red-breasted Merganser *(Mergus serrator)* W-FC
Common Merganser *(Mergus merganser)* Y-U
Hooded Merganser *(Lophodytes cucullatus)* W-U
Ruddy Duck *(Oxyura jamaicensis)* W-U

PHEASANT (Family Phasianidae)
*Ring-necked Pheasant *(Phasianus colchicus)* Y-R, B-R (?)

QUAIL (Family Odontophoridae)
*Mountain Quail *(Oreortyx pictus)* B-R (?)
*California Quail *(Callipepla californica)* Y-U

LOONS (Family Gaviidae)
Common Loon *(Gavia immer)* W-C
Pacific Loon *(Gavia pacifica)* O, M-C, W-U
Red-throated Loon *(Gavia stellata)* O, M-FC, W-U

GREBES (Family Podicipedidae)
*Pied-billed Grebe *(Podilymbus podiceps)* Y-FC
Red-necked Grebe *(Podiceps grisegena)* W-U
Horned Grebe *(Podiceps auritus)* W-FC
Eared Grebe *(Podiceps nigricollis)* W-R
Western Grebe *(Aechmophorus occidentalis)* W-C
Clark's Grebe *(Aechmophorus clarkii)* W-R

SHEARWATERS (Family Procellariidae)
Northern Fulmar *(Fulmarus glacialis)* O, MF-U, W-U
Sooty Shearwater (*Puffinus griseus)* O, MF-C, W-R

PELICANS (Family Pelecanidae)
Brown Pelican (*Pelecanus occidentalis)* PB-FC
American White Pelican *(Pelecanus erythrorhynchos)* V

CORMORANTS (Family Phalacrocoracidae)
*Double-crested Cormorant *(Phalacrocorax auritus)* Y-FC
Pelagic Cormorant (*Phalacrocorax pelagicus)* O, Y-U
Brandt’s Cormorant (*Phalacrocorax penicillatus)* O, Y-U

HERONS (Family Ardeidae)
*American Bittern *(Botaurus lentiginosus)* B-R
*Great Blue Heron *(Ardea herodias)* Y-FC
Great Egret *(Casmerodius albus)* M-U, W-U

VULTURES (Family Cathartidae)
*Turkey Vulture *(Cathartes aura)* B-FC

KITES/HAWKS/EAGLES (Family Accipitridae)
*White-tailed Kite *(Elanus caeruleus)* W-U, B-R (?)
Bald Eagle *(Haliaeetus leucocephalus*) Y-U
Golden Eagle *(Aquilia chrysaetos)* Y-R
*Northern Harrier *(Circus cyaneus*) W-C, B-R (?)
*Sharp-shinned Hawk *(Accipiter striatus*) Y-U
*Cooper's Hawk *(Accipiter cooperii*) Y-U
*Red-tailed Hawk *(Buteo jamaicensis*) Y-U
*Red-shouldered Hawk *(Buteo lineatus)* Y-U
*Osprey *(Pandion haliaetus)* B-FC, W-R

FALCONS (Family Falconidae)
American Kestrel *(Falco sparverius)* M-U
Merlin *(Falco columbarius)* W-U
Peregrine Falcon *(Falco peregrinus)* Y-U
Gyrfalcon *(Falco rusticolus)* V

RAIL/COOT (Family Rallidae)
*Virginia Rail *(Rallus limicola)* B-U
*Sora *(Porzana carolina)* B-R (?)
American Coot *(Fulica americana)* W-FC

PLOVERS (Family Charadriidae)
Black-bellied Plover *(Pluvialis squatarola)* M-C, W-R
Pacific Golden-plover *(Pluvialis fulva)* MF-U, MS-R
American Golden-plover *(Pluvialis dominica)* MF-U, MS-R
Semipalmated Plover *(Charadrius semipalmatus*) M-C, W-R
*Western Snowy Plover *(Charadrius alexandrinus nivosus)* Y-U
*Killdeer *(Charadrius vociferus)* Y-FC

OYSTERCATCHER (Family Haematopodidae)
Black Oystercatcher *(Haematopus bachmani)* M-R

STILTS/AVOCETS (Family Recurvirostridae)
Black-necked Stilt *(Himantopus mexicanus)* V
American Avocet *(Recurvirostra americana)* V

SANDPIPERS (Family Scolopacidae)
Greater Yellowlegs *(Tringa melanoleuca)* M-C
Lesser Yellowlegs *(Tringa flavipes)* M-U
*Spotted Sandpiper *(Actitus macularia*) B-FC
Willet (*Catoptrophorus semipalmatus)* M-U
Whimbrel *(Numenius phaeopus)* M-C
Bristle-thighed Curlew *(Numenius tahitiensis)* V
Long-billed Curlew *(Numenius americanus)* M-U
Marbled Godwit *(Limosa fedoa)* M-U
Ruddy Turnstone *(Arenaria inter)* M-U
Black Turnstone *(Arenaria interpres)* M-U

Sanderling *(Calidris alba)* W-C
Surfbird *(Aphriza virgata)* M-U
Red Knot (*Calidris canutus)* M-U
Semipalmated Sandpiper *(Calidris pusilla)* M-R
Western Sandpiper *(Calidris mauri)* M-C, W-R
Least Sandpiper *(Calidris minutilla)* M-C, W-U
Long-toed Stint *(Calidris subminuta)* V
White-rumped Sandpiper *(Calidris fuscicollis)* V
Baird's Sandpiper *(Calidris bairdii)* M-U
Pectoral Sandpiper *(Calidris melanotos)* M-FC
Sharp-tailed Sandpiper *(Calidris acuminata)* V
Dunlin *(Calidris alpina)* M-C, W-U
Stilt Sandpiper *(Calidris himantopus)* M-R
Buff-breasted Sandpiper *(Tryngites subruficollis)* M-R
Ruff *(Philomachus pugnax)* M-R
Upland Sandpiper *(Bartramia longicauda)* V
Short-billed Dowitcher *(Limnodromus griseus)* M-C
Long-billed Dowitcher *(Limnodromus scolopaceus)* M-C, W-R
Wilson's Snipe *(Gallinago delicata)* W-FC
Red-necked Phalarope *(Phalaropus lobatus)* M-U
Red Phalarope *(Phalaropus fulicaria)* O, M-U, W-R

GULLS/TERNS (Family Laridae)
California Gull *(Larus californicus)* PB-C, W-U
*Western Gull *(Larus occidentalis)* Y-C
Glaucous-winged Gull *(Larus glaucescens)* W-C
Glaucous Gull *(Larus hyperboreus)* W-R
Herring Gull *(Larus argentatus*) M-FC, W-U
Thayer's Gull *(Larus thayeri)* W-U
Bonaparte's Gull *(Larus philadelphia)* M-FC, W-I
Franklin's Gull *(Larus pipixcan)* V
Heermann's Gull *(Larus heermanni*) PB-FC
Mew Gull *(Larus canus)* W-C
Ring-billed Gull *(Larus delawarensis)* W-U
Black-legged Kittiwake *(Rissa tridactyla)* O, W-U
Elegant Tern *(Sterna elegans)* PB-R
Caspian Tern *(Sterna caspia)* M-C

AUKS (Family Alcidae)
Pigeon Guillemot *(Cepphus columba)* O, M-U
Common Murre *(Uria aalge)* O: Y-FC, W-U
Marbled Murrelet *(Brachyramphus marmoratus)* O, Y-R
Rhinoceros Auklet *(Cerorhinca monocerata)* O, M-U

PIGEONS/DOVES (Family Columbidae)
Rock Pigeon *(Columba livia)* Y-R
Band-tailed Pigeon *(Columba fasciata)* M-U
*Mourning Dove *(Zenaida macroura)* B-C

OWLS (Family Tytonidae)
Barn Owl *(Tyto alba)* Y-R

OWLS (Family Strigidae)
*Great-horned Owl *(Bubo virginianus)* Y-U
*Northern Pygmy Owl *(Glaucidium gnoma)* B-R (?)
*Western Screech-Owl (*Otus kennicottii)* Y-R (?)
Burrowing Owl (*Athene cunicularia*) M-R, W-R

NIGHTJARS (Family Caprimulgidae)
*Common Nighthawk *(Chordeiles minor)* B-U
Common Poorwill *(Phalaenoptilus nuttalli*) V

SWIFTS (Family Apodidae)
Black Swift *(Cypseloides niger)* M-U
*Vaux's Swift *(Chaetura vauxi)* M-C, B-U

HUMMINGBIRDS (Family Trochilidae)
*Anna's Hummingbird *(Calypte anna)* Y-FC
*Allen's Hummingbird *(Selasphorus sasin)* B-FC
*Rufous Hummingbird *(Selasphorus rufus)* M-C, B-U

KINGFISHER (Family Alcedinidae)
*Belted Kingfisher *(Ceryle alcyon)* Y-FC

WOODPECKERS (Family Picidae)
*Northern Flicker *(Colaptes auratus)* Y-C
*Downy Woodpecker *(Picoides pubescens)* Y-U
*Hairy Woodpecker *(Picoides villosus)* Y-U
*Pileated Woodpecker *(Dryocopus pileatus)* Y-U
Red-breasted Sapsucker *(*Sphyrapicus ruber*)* Y-R

FLYCATCHERS (Family Trannidae)
*Olive-sided Flycatcher *(Contopus borealis)* B-U
*Western Wood-Pewee *(Contopus sordidulus)* B-U
*Pacific Slope Flycatcher *(Empidonax difficilis)* B-FC
*Black Phoebe *(Sayornis nigricans)* W-U, B-R
Hammond's Flycatcher *(Empidonax hammondii)* M-R
Eastern Kingbird (*Tyrannus tyrannus)* V

SHRIKES (Family Lannidae)
Northern Shrike *(Lanius excubitor)* W-R

VIREOS (Family Vireonidae)
*Hutton's Vireo *(Vireo huttoni)*Y-U
*Warbling Vireo *(Vireo gilvus)* M-U, B-R
Cassin's Vireo *(Vireo cassinii)* M-R

JAYS/CROWS/RAVENS (Family Corvidae)
*Steller's Jay *(Cyanocitta stelleri)* Y-FC
*American Crow *(Corvus brachyrhynchos)* Y-C
*Common Raven *(Corvus corax)* Y-C

HORNED LARKS (Family Alaudidae)
Horned Lark *(Eremophila alpestris)* M-R, W-R

SWALLOWS (Family Hirundinidae)
*Tree Swallow *(Tachycineta bicolor)* B-FC
*Violet-green Swallow *(Tachycineta thalassina)* B-FC
*Purple Martin *(Progne subis)* B-R (?)
*Northern Rough-winged Swallow *(Stelgidopteryx serripennis)* B-U
*Barn Swallow *(Hirundo rustica)* B-C
*Cliff Swallow *(Hirundo pyrrhonota)* B-U
Bank Swallow *(Riparia riparia)* M-R

CHICKADEES (Family Paridae)
*Black-capped Chickadee *(Parus atricapillus)* Y-U
*Chestnut-backed Chickadee *(Parus rufescens)* Y-FC
Mountain Chickadee *(Parus gambeli)* V

BUSHTITS (Family Aegithalidae)
*Bushtit *(Psaltriparus minimus)* Y-U

NUTHATCHES (Family Sittidae)
*Red-breasted Nuthatch *(Sitta canadensis)* B-U, W-I

CREEPERS (Family Certhiidae)
* Brown Creeper *(Certhia americana)* W-U, B-R

WRENS (Family Troglodytidae)
*Marsh Wren *(Cistothorus palustris)* Y-C
*Bewick's Wren *(Thryomanes bewickii)* Y-U
*Winter Wren (*Troglodytes troglodytes)* W-C, B-R
House Wren *(Troglodytes aedon)* M-R

KINGLETS (Family Regulidae)
Ruby-crowned Kinglet *(Regulus calendula)* W-C
*Golden-crowned Kinglet *(Regulus satrapa)* Y-FC

THRUSHES (Family Turdidae)
Western Bluebird *(*Sialia mexicana*)* M-R
Varied Thrush *(Ixoreus naevius)* W-FC
Townsend's Solitaire *(Myadestes townsendi)* V
*Swainson's Thrush *(Catharus ustulatus)* B-C
Hermit Thrush *(Catharus guttatus)* W-FC
Veery *(Catharus fuscescens*) V
*American Robin *(Turdus migratorius)* Y-C

WRENTIT (Family Timaliidae)
*Wrentit *(Chamaea fasciata)* Y-C

MIMIC THRUSHES (Family Mimidae)
Northern Mockingbird *(Mimus polyglottus)* V

STARLINGS (Family Sturnidae)
European Starling *(Sturnus vulgaris)* Y-R

PIPITS (Family Motacillidae)
American Pipit *(Anthus rubescens)* M-C, W-U

WAXWINGS (Family Bombycillidae)
*Cedar Waxwing *(Bombycilla cedrorum)* B-U

WARBLERS (Family Parulidae)
*Orange-crowned Warbler *(Vermivora celata)* B-C, W-R
Nashville Warbler *(Vermivora ruficapilla)* M-R
Yellow Warbler *(Dendroica petechia)* M-U
*Yellow-rumped Warbler *(Dendroica coronata)* Y-C
*Black-throated Gray Warbler *(Dendroica nigrescens)* B-U
MacGillivray's Warbler *(Oporornis tolmiei)* M-R
*Common Yellowthroat *(Geothlypis trichas)* B-C
*Wilson's Warbler *(Wilsonia pusilla)* B-U
Hermit Warbler *(Dendroica occidentalis)* M-R
Townsend's Warbler *(Dendroica occidentalis)* W-U
Palm Warbler *(Dendroica palmarum)* M-R, W-R

TANAGERS (Family Thraupidae)
*Western Tanager *(Piranga ludoviciana)* B-FC

SPARROWS (Family Emberizidae)
*Song Sparrow *(Melospiza melodia)* Y-C
Lincoln's Sparrow *(Melospiza lincolnii)* W-U
*White-crowned Sparrow *(Zonotrichia leucophrys)* Y-C
Golden-crowned Sparrow *(Zonotrichia atricapilla)* W-C
White-throated Sparrow *(Zonotrichia albicollis)* W-R
Fox Sparrow *(Passerella iliaca)* W-C
*Dark-eyed Junco *(Junco hyemalis)* W-FC, B-U
*Savannah Sparrow *(Passerculus sandwichensis)* B-FC, W-R
Chipping Sparrow *(Spizella passerina)* M-R
*Spotted Towhee *(Pipilo maculatus)* Y-FC
*Oregon Vesper Sparrow *(Pooecetes gramineus affinis)* B-R
Lapland Longspur *(Calcarius lapponicus)* M-U, W-R

GROSBEAKS/BUNTINGS (Family Cardinalidae)
*Black-headed Grosbeak *(Pheucticus melanocephalus)* B-U
Lazuli Bunting *(Passerina amoena)* M-R

BLACKBIRDS (Family Icteridae)
*Red-winged Blackbird *(Agelaius phoeniceus)* Y-U
*Brewer's Blackbird *(Euphagus cyanocephalus)* Y-R, B-R
*Brown-headed Cowbird *(Molothrus ater)*B-FC
Western Meadowlark *(Sturnella neglecta)* W-U
Common Grackle *(Quiscalus major)* V

FINCHES (Family Fringillidae)
*Pine Siskin *(Carduelis pinus)* B-U, W-I
*American Goldfinch *(Carduelis tristis)* B-C, W-R
*Purple Finch *(Carpodacus purpureus)* B-C, W-U
House Finch *(Carpodacus mexicanus)* Y-R
*Red Crossbill *(Loxia curvirostra)* Y-I
Evening Grosbeak *(Coccothraustes vespertinus)* M-U

WEAVERS (Family Passeridae)
*House Sparrow *(Passer domesticus)* Y-R, B-R (?)

Mammals

* indicates potential for the species to occur, as suggested by range maps and other references

OPOSSUMS (Family Didelphiidae)
Virginia Opossum (*Didelphis virginianus)*

SHREWS (Family Soricidae)
Vagrant Shrew (*Sorex vagrans)*
Trowbridge Shrew (*Sorex trowbridgii)**
Pacific Shrew (*Sorex pacificus*)*

MOLES (Talpidae)
Shrew Mole (*Neurotrichus gibbsii*)*
Townsend Mole (*Scapanus townsendii*)*
Coast Mole (*Scapanus orarius*)*

EVENING BATS (Family Vespertilionidae)
Little Brown Bat (*Myotis lucifugus*)
Long-Eared Myotis (*Myotis evotis*)*
Hoary Bay (*Lasiurus cinereus*)*
Townsend's Big-Eared Bat (*Corynorhinus townsendii*)*
Long-Legged Myotis (*Myotis volans*)*
California Myotis (*Myotis californicus*)
Big Brown Bat (*Eptesicus fuscus*)
Yuma Myotis (*Myotis yumanensis*)
Silver-Haired Bat (*Lasionycteris noctivagans*)*

RABBITS (Family Leporidae)
Brush Rabbit (*Sylvilagus bachmani*)

SQUIRRELS (Family Sciuridae)
California Ground Squirrel (*Spermophilus beecheyi*)
Western Gray Squirrel (*Sciurus griseus*)
Northern Flying Squirrel (*Glaucomys sabrinus*)
Townsend's Chipmunk (*Eutamias townsendi*)*

POCKET GOPHERS (Family Geomyidae)
Western pocket Gopher (*Thomomys mazama*)

BEAVERS (Family Castoridae)
American Beaver (*Castor Canadensis*)

MICE, VOLES, AND MUSKRATS (Family Cricetidae)
Deer Mouse (*Peromyscus maniculatus*)
Long-Tailed Vole (*Microtus longicaudus*)
Townsend's Vole (*Microtus townsendii*)*
Creeping Vole (*Microtus oregoni*)*
Bushy-Tailed Woodrat (*Neotoma cinerea*)
Muskrat (*Ondatra zibethicus*)*

RATS (Family Muridae)
Norway Rat (*Rattus norvegicus*)*
Black Rat (*Rattus rattus*)*
House Mouse (*Mus musculus*)*

JUMPING MICE (Family Zapodidae)
Pacific Jumping Mouse (*Zapus trinotatus*)*

PORCUPINE (Family Erethizontidae)
Porcupine (*Erethizon dorsatum*)

FOXES (Family Canidae)
Coyote (*Canis latrans*)
Red Fox (*Vulpes vulpes*)

BEARS (Family Ursidae)
Black Bear (*Ursus americanus*)

RACCOON (Family Procyonidae)
Raccoon (*Procyon lotor*)

WEASEL, SKUNK, OTTER, MINK, MARTEN (Family Mustelidae)
Long-tailed Weasel (*Mustela frenata*)
Striped Skunk (*Mephitis mephitis*)
River Otter (*Lutra canadensis*)
Mink (*Mustela vison*)
American Marten (*Martes Americana*)

CATS (Family Felidae)
Mountain Lion (*Felis concolor*)
Bobcat (*Lynx rufus*)

DEER (Family Cervidae)
Blacktailed Deer (*Odocoileus hemionus columbians*)
Roosevelt Elk (*Cervise elaphus roosevelti*)*

HAIR SEALS (Family Phocidae)
Harbor Seal (*Phoca vitulina*)

EARED SEALS (Family Otariidae)
Steller Sea Lion (*Eumetopias jubatus*)*
California Sea lion (*Zalophus californianus*)*

Amphibians

* indicates potential for the species to occur, as suggested by range maps and other references

MOLE SALAMANDERS (Family Ambystomatidae)
Northwestern Salamander (*Ambystoma gracile*)
Pacific Giant Salamander (*Dicamptodon ensatus*)*

LUNGLESS SALAMANDERS (Family Plethodontidae)
Clouded Salamander (*Aneides ferreus*)
Southern torrent Salamander (*Rhyacotriton olympicus*)*
Ensatina (*Ensatina eschscholtzi*)*
Dunn's Salamander (*Plethodon dunni*)*
Western Redbacked Salamander (*Plethodon vehiculum*)*

NEWTS (Family Salamandridae)
Roughskin Newt (*Taricha granulosa*)

TREE FROGS (Family Hylidae)
Pacific Treefrog (*Ascaphus regilla*)

BELL TOADS (Family Leiopelmatidae)
Tailed Frog (*Ascaphus truei*)*

TRUE FROGS (Family Ranidae)
Redlegged Frog (*Rana aurora*)
Bullfrog (*Rana catesbeiana*)

Reptiles

* indicates potential for the species to occur, as suggested by range maps and other references

SEA TURTLES (Family Cheloniidae)
Green Sea Turtle (*Chelonia mydas*)*
Logger-head Sea Turtle (*Caretta curetta*)*
Pacific Ridley Sea Turtle (*Lepidochelys olivacea*)*

SEA TURTLES (Family Dermochelyidae)
Leather-back Sea Turtle (*Dermochelys coriacea*)*

WATER AND BOX TURTLES (Family Emydidae)
Northwestern Pond Turtle (*Clemmys marmorata*)

ALLIGATOR LIZARDS (Family Anguidae)
Northern Alligator Lizard (*Elgaria coerulea*)*

IGUANIDS (Family Iguanidae)
Western Fence Lizard (*Sceloporus occidentalis*)
Sagebrush Lizard (*Sceloporus graciosus*)*

SKINKS (Family Scincidae)
Western Skink (*Eumeces skiltonianus*)*

BOAS (Family Bioidae)
Rubber Boa (*Charina bottae*)

COLUBRID SNAKES (Family Colubridae)
Northwestern Garter Snake (*Thamnophis ordinoides*)*
Common Garter Snake (Thamnophis sirtalis)*
Western Terrestrial Garter Snake (*Thamnophis elegans*)*

Appendix E
Fish Habitat Use and Life History

Coho Salmon

Coho salmon are native to the Floras Creek and New River system. Large numbers of adult coho salmon once spawned in Floras Creek, Morton Creek, Butte Creek, Bethel Creek, and Fourmile Creek. All of these creeks feed into New River or its adjacent lakes and wetlands (Oregon Fish Commission 1967). Recent spawning surveys and interviews with local anglers indicate that the coho salmon population in the New River basin is at a fraction of its historic level. Historically, coho salmon used approximately 30 miles of stream in the system for spawning. Currently, coho use approximately 18 miles (Todd Confer, personal communication). Spawning surveys conducted from 1989 to 1993 show that Fourmile, Morton, Bethel, Butte, and Willow Creeks support moderate to high spawning densities of coho salmon, whereas Davis and Floras Creek support low spawning densities (Todd Confer, personal communication).

At one time the coho salmon population in the Floras Creek and New River system was about 2,500 adults. The current population, based on a five year average, is probably less than 500 adults and 150 jacks per year (ODFW 1989; Todd Confer, personal communication). In 1993, spawning escapement of salmon was 850 adults and 160 jacks; nearly double the estimate of the previous four years. This higher escapement may be partially attributable to reductions that occurred in ocean harvest or a slight improvement in ocean conditions.

Many factors have contributed toward the decline in salmon in the New River basin. Factors include: elimination of wetlands, channel straightening, removal of riparian vegetation and large woody material, increased sediment yields from timber harvesting activities, introduction of warm-water fish species to freshwater lakes, and low summer flows and high water temperatures brought on by drought and agricultural water use. The overall reduction in wetlands and introduction of warm-water fish (i.e., largemouth bass) to Floras Lake, New Lake, and Croft Lake, may in combination, have eliminated prime year-round lake-rearing habitat for young salmon.

After hatching from eggs and emerging from the gravel, coho salmon commonly rear in freshwater for one to two winters as fingerlings before making their seaward migration as smolts. Their preferred habitat includes deep pools and off channel areas in their nursery streams, as well as lakes, ponds, and open wetlands. These lake and stream features provide coho salmon with rearing habitat throughout the year. They are especially important in providing slow moving water and abundant cover for young fish to wait out winter floods. During summer, coho have been observed in New River in the vicinity of New Lake outlet. Juvenile coho may utilize habitat in New Lake and other freshwater lakes during winter high flows, but drop down into New River during lower flows. Braided and meandering channels in New River near New Lake outlet contain abundant undercut bank and edge habitat which provide excellent cover for salmon and trout. Sample data in 1989 and 1991 indicates that juvenile rearing in New River may grow up to 20 mm in length between June and September (USDI BLM 1991).

In 1972 and 1973, Trask River stock of coho salmon juveniles were released into Floras Lake, and in 1981, several hundred thousand Rogue River stock fry were released (ODFW 1989). Since 1981, Coquille River stock fry have been released sporadically by the Salmon Trout Enhancement Program (ODFW 1989).

Chinook Salmon

Fall Chinook salmon are native to the Floras Creek and New River system. The population currently consists of naturally produced fish and a few stray hatchery fish from other systems. However, there have been a few scattered releases of Elk River stock fall Chinook salmon fingerlings (released in 1973 and 1974), and Floras Creek stock fall Chinook salmon fry (released in 1983 and 1984). (ODFW 1989)

The Floras Creek and New River stock appears to be unique in that it comprises one of the best fall runs of exclusively wild fish on the southern Oregon Coast (Westfall 1987, personal communication in USDI BLM 1987). However, little data has been collected to document characteristic life history traits, and the population has not been fully quantified. South coast stocks of fall Chinook salmon are listed as state sensitive critical and are considered at high risk of extinction (American Fisheries Society 1991).

Although data for Floras Creek and New River fall Chinook salmon is limited, their natural history appears to parallel that of stocks in the adjacent Sixes River basin (as described by Reimers 1971, Nicholas and Hankin 1988). Adult fish typically enter New River from mid-October to mid-December, with numbers peaking during late November. When the mouth is sealed by a sand bar (often into November), many fish swim over the low sand dune during high tide, or they wait until the mouth breaks open.

Most fish migrate up Floras and Willow creeks to spawn. Periodic spawning surveys since 1989 have not identified Chinook salmon in Davis, Bethel, Butte, and Morton Creeks (ODFW spawning survey data). Spawning takes place from mid-November through January, with a peak usually during mid-December (Nicholas and Hankin 1988). As with the adjacent Sixes River, the geographic location indicates that Floras Creek and New River stocks probably migrate north. Four year old fish make up the majority of female spawners (Nicholas and Hankin 1988).

Several life history types, or life cycles, of juvenile Chinook salmon were observed in the Sixes River basin. Reimers (1971) found that the most prevalent type (and most successful in surviving to return as adult spawners) reared for several months in freshwater streams, and then lived for several months in the estuary before entering the ocean in September and October. Other less successful types spent either more or less time in freshwater or entered the ocean quickly after having spent very little time in the estuary. The estuary provides a place where the fish can grow to large sizes and become conditioned to salt water, referred to as the smolt stage. This behavior seemed to improve survival at sea during some years.

Several weeks to months after emerging from the gravel in early spring, the young begin migrating down Floras Creek and New River. It is hypothesized that there are also several life history types in the Floras Creek and New River population. This variety of life history types provides the diversity needed for the population to recover from catastrophic environmental events such as flood or drought. Sampling efforts since 1985 indicate that juvenile Chinook salmon rear throughout New River and its estuary during summer (June through October). Smolts, juvenile fish that have begun their physical adaptation to saltwater, enter the ocean any time between June and October. The last of them are flushed out when the river breaches at the onset of fall and winter rain storms.

In some years, juvenile migration partially coincides with channel drying between Bono Ditch and New Lake outlet. Juveniles surviving migration through this low flow partially dry section take advantage of excellent rearing habitat down stream. Large, deep pools persist during drought periods in the braided channels near New Lake outlet. The 1992 sampling efforts showed that juvenile Chinook salmon grew about eight millimeters in length during July, but almost no growth occurred during August.

In comparison, juvenile Chinook salmon in Sixes River averaged 20 mm larger than New River fish at ocean entrance (Reimers 1971; Nicholas and Hankin 1988). Growth in New River may be limited by dwindling food resources after the mouth closes or by decreased stream flow and elevated water temperatures during late summer (USDI BLM 1992).

Even when flow is continuous throughout the summer, water temperatures in New River can reach 76°F. Acceptable water temperatures range from 45°F to 65°F. A continuous, uninterrupted surface flow in New River would allow fish to migrate through even shallow riffles, less than one-foot deep, and reduce the chance of temperature stress, mortality, and predation.

Winter Steelhead

Unlike Pacific salmon, steelhead do not always die after spawning, but may return to the ocean and spawn again in following years. Steelhead also differ from their salmonid cousins by rearing in freshwater for at least two years before migrating to the ocean. Juvenile steelhead have been observed throughout New River.

Steelhead are known to spawn in Floras, Willow, Morton, Butte, Bethel, Davis, and Fourmile Creeks, and their tributaries between February and April (Oregon Fish Commission 1967). Steelhead are known to migrate at least to the confluence of the North and South Forks of Floras Creek. From 1981 through 1986, The Salmon Trout Enhancement Program conducted annual releases of native stock winter steelhead into Floras Creek (ODFW 1989). Estimated catch of winter steelhead in the recreational fishery has ranged from 90 to 630 fish, with 250 on average, between the 1972 and 1987 seasons (ODFW 1989).

Cutthroat Trout

The population status of cutthroat trout in New River is unknown. Sea-run cutthroat trout in south coast basins are considered at moderate risk of extinction (American Fisheries Society 1991).

Cutthroat trout have been sampled throughout New River and many are caught in the recreational fishery. Sea-run cutthroat trout up to 16 inches in length use habitat in Floras Lake outlet and the braided mid-reaches of New River, where depth exceeds four feet during summer, and where undercut bank and overhanging vegetation habitat is abundant. Cutthroat trout spawn in Floras and Willow Creeks (Oregon Fish Commission 1967). An isolated population of resident cutthroat trout is known upstream from the cascades on Willow Creek.

Pacific Lamprey

In spring 2002, Pacific lamprey were sampled by a smolt trap in Floras Lake outlet. Most of those caught were ammocoetes; however, several adults were also caught. It is assumed that the ammocoetes are Pacific lamprey and not river lamprey or western brook lamprey, since ammocoetes from different species are difficult to distinguish. The distinguishing tooth patterns of the parasitic oral discs do not develop fully until the late stages of metamorphism. The ammocoetes move downstream during their development, and by the time eye and the naso-pineal glands are obvious, they would be nearly to the ocean to begin the parasitic phase of their life history. Out-migration may occur November through June; however, there are recordings of it occurring nearly year-round. The period of metamorphism may be long, or it may vary regionally (Kostow 2002).

It is unlikely that adults spawn within New River, since they select spawning gravels just upstream of riffles and often near slow-watered silty pools and banks. Adults will also spawn in areas prone to collect organic matter, which is ammocoete habitat. Pacific lamprey spawn within Floras Lake outlet and likely other places in the system where their habitat exists.

Pacific lamprey enter salt water and become parasitic, feeding on a wide variety of fish and occasionally whales. In turn, they are a preferred food for other fish and mammals as they provide more calories and nutrition than most fishes.

Lampreys are observed to spawn in the spring between March and May on the Oregon Coast. Most scientists believe that all lamprey die soon after spawning. However, the out-migration of several hundred apparently robust lampreys have been observed on the Olympic Peninsula (Kostow 2002). ODFW staff and volunteers on the south Oregon Coast believe that they have seen out-migration after spawning by some lamprey.

Pacific, western brook, and river lamprey are currently (2003) under petition with the USFWS for determination of listing under the Endangered Species Act.

Other Fishes

The total complement of fish species in the New River basin has not been completely sampled nor described. In addition to salmonids, several freshwater, estuarine, and marine fish species can be found in New River (Table 4).

Appendix F
New River ACEC Acreage

The previous version of the New River Management Plan based ACEC acreage figures on government lots, as described on the Master Title Plat. The Master Title Plat is the Bureau's record of title and is used mainly as a graphic display of township survey data. The Master Title Plat does not reflect title changes which are a result of lateral movement of rivers or other bodies of water, nor do they describe the portion of land lying between the meander line and mean high tide. County Tax Lot acreage is based on recorded private and cadastral surveys which include that portion of land lying between the meander line and mean high tide. For acquisition purposes both acreage figures are displayed in Tables 7-9.

Table 7. BLM lands originally designated as the New River ACEC located in Coos County

Township / Range	County Records	Master Title Plats
T. 30 S., R. 15 W.	Section 3 Portion of SE¼ Tax Lot Numbers (TLNs) 400,401 Encompassing 97.58 acres +/-	Section 3 Lots 3,4 Encompassing 75.58 acres +/-
	Section 10 Portion of W½ TLNs 500,501, 300,301 Encompassing 170.23 acres +/-	Section 10 SWSE,Lots1,2,3,4 Encompassing 129 acres +/-
	Section 15 NWNE,E½NW,NESW, E½SWSW TLNs 200,300 Encompassing 210.23 acres +/-	Section 15 NWNE, Lots 1,2,3,4 Encompassing 156.83 acres +/-
	Section 21 Portion of NESE,SENE TLNs 100,101 Encompassing 51.56 acres +/-	Section 21 Lot 2 Encompassing 22.36 acres +/-
	Section 22 W½NW, NWSW TLN 300 Encompassing 127.23 acres +/-	Section 22 NWSW, Lots 1,2 Encompassing 109.83 acres +/-
Total Original Acres	**656.83 acres**	**493.60 acres**

Table 8. BLM lands later added to the New River ACEC located in Curry County

Township / Range	County Records	Master Title Plats
T. 30 S., R. 15 W.	Section 32 Portion of SESE TLN 1100 Encompassing 2.18 acres +/-	Section 32 Lot 1 Encompassing 2.18 acres +/-
	Section 33 Portion of E½SWSW, NWSW. TLNs 1001, 1200 Encompassing 27.40 acres +/-	Section 33 Lot 2 Encompassing 27.40 acres +/-
Total BLM Lands Added to ACEC	**29.58 acres**	**29.58 acres**
Total BLM Lands designated as the New River ACEC	**686.41 acres**	**523.18 acres**

Table 9. Private lands acquired by BLM and added to the New River ACEC

Township / Range Name / County Acquisition Year	County Records	Master Title Plats
T. 30 S., R. 15 W. Toth Exchange Coos County 1986	Section 2 Portion of NWNW TLN 501 Encompassing 14.2 acres +/-	Section 2 Lot 2 Encompassing 14.2 acres +/-
T. 30 S., R. 15 W. Storm Ranch Purchase Coos County 1991	Section 2 W½SW TLN 700 Section 10 E½NE TLNs 100,200 Section 11 W½NW,W½SENW TLN 400 Encompassing 240.15 acres +/-	Section 2 W½SW TLN 700 Section 10 E½NE TLNs 100,200 Section 11 W½NW,W½SENW Encompassing 240.15 acres +/-
T. 30 S., R. 15 W. Hammond Purchase Coos County 1991	Section 28 S½NE,NWSE TLNs 900,901 Encompassing 111.66 acres +/-	Section 28 SENE, Lots 2,3 Encompassing 105.45 acres +/-

Township / Range Name / County Acquisition Year	County Records	Master Title Plats
T. 31 S., R. 15 W. Floras Lake Purchase Curry County 1994	Section 7 Portion of SESESE, TLNs 500,501 Section 8 Portion of E½NW,E½SWNW, N½SW,W½SWSW. Encompassing 129.51 acres +/-	Section 7 Lot 1, Section 8 Lots 3,4,5,6 Encompassing 111.48 acres +/-
T. 29 S., R. 15 W. Lost Lake Purchase Coos County 1994	Section 35 N½NENE TLN 100 Section 36 Portion of S½NWNENW,SWNENW, NWNW. Encompassing 71.08 acres +/-	Section 35 N½NENE TLN 100 Section 36 Portion of S½NWNENW,SWNENW, NWNW. Encompassing 71.08 acres +/-
T. 30 S., R. 15 W. Paullus Purchase Coos County 1995	Section 21 N½SESE TLNs 202,302 Encompassing 24.95 acres +/-	Section 21 Lot 1 Encompassing 32.78 acres +/-
T. 30 S., R. 15 W., W.M. Kahn Purchase Coos/Curry Counties 1995	Section 21 (Coos) S½SESE TLNs 201,301, Section 28 (Curry) Portion of N½NE TLNs 800,801 Encompassing 78.15 acres +/-	Section 21 (Coos) S½SESE TLNs 201,301, Section 28 (Curry) Lot 4 Encompassing 72.2 acres +/-
Total Acquired Lands Designated as ACEC	**669.70 acres**	**647.34 acres**
Total Public Lands Designated as ACEC	**686.41 acres**	**523.18 acres**
Grand Total ACEC Acreage	**1,356.11 acres**	**1,170.52 acres**

Appendix G
General Rules and Regulations

The following list includes general rules and regulations for visitors to the New River ACEC. This list summarizes key rules that have been developed from various management actions described in Part Three of this plan. These have been created to protect the unique natural, cultural, and recreation settings (i.e., roaded natural and semi-primitive non-motorized) of the area.

- **Motorized vehicles:** Motorized vehicles are limited to designated roads only. River Road is seasonally closed to vehicular traffic from March 15 through September 15 to minimize disturbance to Western Snowy Plovers nesting on the dunes west of the boat launch.

- **Pet leashing:** To minimize harassment of wildlife, pets must be leashed at all times. Exceptions are trained hunting dogs used for waterfowl hunting in designated areas during the proper season.

- **Camping:** Camping is allowed for educational, research, or work purposes. Beach camping is allowed under special circumstances for long-distance backpackers hiking the Oregon Coast Trail and requires a special permit issued by the BLM. Two-week advance notice is required.

- **Campfires:** Open campfires are prohibited except by special permit. Camp stoves are allowed without prior approval.

- **Hours of operation:** The New River ACEC is open year-round from sunrise to sunset.

- **Seasonal beach restrictions:** Designated dry sand portions of the beach above mean high tide are closed to the public from March 15 through September 15 to protect nesting Western Snowy Plovers.

- **Special forest products:** The collection of any forest product within the ACEC is prohibited. Forest products include but are not limited to: mushrooms, Christmas trees, boughs, ferns, salal, huckleberry, firewood, grass, cattail, post and poles, driftwood, wildflowers, and seed. Special permits may be authorized to collect plants and/or animals for educational or research purposes.

- **Waterfowl hunting:** Waterfowl hunting is allowed on BLM land along New River south of Croft Lake outlet pursuant to all applicable state and federal regulations. Waterfowl hunting north of Croft Lake outlet is prohibited for public safety reasons. All other forms of hunting and trapping are prohibited within the ACEC except by special permit.

- **Fishing:** Sport fishing is allowed within the New River ACEC according to all applicable state and federal regulations.

- **Weapons:** For public safety, the discharging of firearms is prohibited within the ACEC. Shotgun use for legal waterfowl hunting is permitted along New River south of the Croft Lake outlet only.

- **Boating:** Boating on New River is allowed in accordance with all applicable state regulations.

- **Minerals:** The New River ACEC is closed to locatable (mining claims) and salable (construction sand and gravel) mining.

- **Bicycles and horses:** Bicycles and horses are permitted on trails designed for their use.

Appendix H
Monitoring and Evaluation Guidelines for Managing Recreational Use

Purpose

BLM has developed an on-going monitoring and evaluation process to guide recreational use management at New River in order to avoid unacceptable impacts to the natural resources and recreation settings (i.e., roaded natural and semi-primitive non-motorized) of the area. This process is similar to the Limits of Acceptable Change (LAC) planning system developed by the U.S. Forest Service for wilderness areas (Stankey et al. 1985). However, in order to adapt the LAC process to management at New River, only certain components of the framework have been incorporated. The intent remains the same: to maintain an appropriate balance between protecting resource values and providing recreational opportunities for the visiting public.

After attempting to apply all nine steps of the LAC process at New River, we recognized the limitations of applying it to such dynamic biological systems. These complex systems are not only affected by recreational impacts, but by a wide range of variables that occur both within and outside the boundaries of the ACEC. Because of this, it is difficult to attribute impacts to these ecosystems directly with a change in recreational use. Moreover, there is a lack of data available to measure all aspects of these natural systems, which further limits our ability to understand the dynamics involved.

Process

Monitoring and evaluating recreation use at New River places emphasis on maintaining desired conditions rather than how much use the area can tolerate. The process includes: (1) identify potential issues and concerns resulting from changes in recreation use, (2) develop appropriate criteria for measuring change in resource and social conditions, (3) routinely monitor resource and social conditions relative to these concerns, (4) routinely evaluate if unacceptable changes to those conditions are occurring from recreation use, and if necessary, implement an alternative management action to quickly remedy a situation. The process is proactive and establishes a framework for accountability, enabling the BLM to more effectively manage New River for both resource protection and recreational use.

Steps 1 and 2 establish the framework for managing visitor-use-related changes, which have already been completed. Steps 3 and 4 are on-going and may trigger management actions needed to avoid unacceptable impacts before they occur. The following describes each of the four steps selected for the New River ACEC.

Please note that this process only addresses recreational activities legally sanctioned by the BLM. It does not include conflicts or impacts resulting from illegal activities (e.g., collecting forest products, using off-road vehicle, disturbance to cultural resources, non-permitted camping, etc.). Illegal activities are dealt with separately through law enforcement strategies and compliance monitoring. BLM does not tolerate any illegal activities; therefore no acceptable level of change exists.

Step 1. Potential issues and concerns resulting from recreational use

The New River ACEC contains a wide variety of outstanding ecological and recreational values that warrant special management attention. Understanding the potential issues and concerns associated with these values is an important step to maintaining a balanced approach to visitor use management of the area. Table 10 identifies potential resource impacts and social conflicts that may result from changes in recreation use. The table does not include all possible problems, but it does provide a starting point for the evaluation process.

Table 10. Potential issues and concerns that may result from changes in recreational use

Area	Activity	Potential Resource Impacts	Potential Social Conflicts
Along roads parking areas, trailheads, and boat launches	Sightseeing from or near vehicles	• Excessive noise from frequent vehicle traffic may disturb wildlife (i.e., breeding song birds) • Disturbance to migratory birds using the river near the boat launch, especially during fall migration when the lower gate to the river is open to vehicles • Riparian vegetation impacts near boat launch caused by excessive foot traffic or parking off roadway • Wildlife killed by passing vehicles	• Overcrowding (too many visitor encounters) • Increased vehicle traffic to and from boat launch area (includes speeding along narrow gravel road used by other motorists, hikers, bicyclists, and horseback riders) • Traffic congestion due to limited parking • Traffic congestion due to limited turn-around opportunities for RVs and other large vehicles • Safety concerns with increase in vehicle traffic near picnic areas, learning center, and other higher use areas
New River and other waterways with the ACEC (i.e., Floras Lake and Croft Lake outlets)	Boating	• Disturbance to wildlife (e.g., migratory birds, birds of prey, breeding plovers) caused by an increase in human presence on the river and adjacent habitats made more accessible.	• Overcrowding and conflicts between user groups (i.e., waterfowl hunters during fall hunting season)
	Fishing	• Excessive pressure on salmonid populations caused by an increase in the number of fish caught • Riparian vegetation impacts near boat launch caused by excessive foot traffic • Disturbance to migratory birds on river (especially near the boat launch where the majority of people fish) • Increase in trash along river from lures/bait containers, etc.	• Overcrowding, particularly along the river near boat launch during peak fishing season • Social conflicts between commercial guides, duck hunters, boaters, and other users
	Duck Hunting	• Disturbance/harassment to waterfowl using the river as a stop-over during fall migration • Increase in trash along river from spent shotgun shells, temporary blinds	• Overcrowding during hunting season • Conflicts between hunters and other user groups (safety concerns for boaters, fishermen, and hikers at viewpoints along river)
Trail system (i.e., trails at Storm Ranch, Floras Lake, Fourmile, and Lost Lake)	Hiking	• Disturbance to song bird populations during nesting season (March - August) caused by excessive noise, pets off leash, or human presence near nest sites • Development of side trails, multiple trails, increased trail width, and trash	• Overcrowding (excessive number of encounters with other trail users leads to loss of solitude) • Conflicts between user groups (bikers and horse riders) • Noncompliance of pet leash law (which may disturb other hikers, bikers, or horse riders)
	Horseback Riding	• Same as pedestrians, but increased potential for trail damage and off-trail use • Introduction of exotic plants from manure	• Conflicts with other user groups (hikers and bikers) • Need for additional parking for trailers (which is limited)
	Bicycling	• Same as above, especially development of side trails and off-trail use • Rutting of trails and increased erosion	• Conflicts with other user groups • Short trail loop at Storm Ranch may create a 'race track' effect for more experienced mountain bike users
Foredune and Beaches	Hiking, Camping	• Western Snowy Plover nest failures (March 15 - Sept 15), disturbance to migratory and resident shorebirds resulting from human presence • Increase in trash, fire rings, and other evidence from camping	• Overcrowding resulting in loss of solitude • Conflicts with other user groups
Other Areas	Off-trail exploration	• Development of unplanned trails • Disturbance to special status plant and animal populations • Vegetation trampling • Disturbance to song-bird nesting areas	• Conflicts with other user groups • Creation of new side trails may make it difficult for hikers to determine location of designated trails

Step 2. Criteria for Measuring Resource and Social Conditions

Criteria for measuring resource and social conditions within the ACEC have been established to help determine if unacceptable changes are occurring (Table 11). The criteria set for these conditions have specific, measurable standards associated with them that provide a basis for evaluation. For social conditions, the standards are set more to detect trends in recreation use and visitor satisfaction. An increasing trend in use does not indicate that a recreation impact is occurring; it simply highlights the need to focus more closely on the relationship between that change in use and the resource(s) associated with it.

Table 11. Criteria for Measuring Resource and Social Conditions

Resource or Social Condition	Monitoring Criteria	Standard
Song bird population abundance	Difference between the mean number of detections for eight species of song birds nesting along recreation trails and off-trail areas during the breeding season (March – August)	Two of the eight species monitored show significant change in the difference between the 'mean' over a two year period. Significant change occurs when the range of a confidence interval bar of one data set does not overlap with the range of a confidence interval bar of the previous year's data set for each species (as shown in Figure 2)
Quality of the physical environment in areas routinely used by visitors	Change in the physical condition of areas within established photo points along the roads, river, and trails	Photos show an increasing trend in degradation of areas adjacent to roads, parking lots, or along river banks; a widening or entrenchment of trails; development of new trails; and/or damage to adjacent vegetation in these areas
Level of Recreation Use	Change in the number of visitors and/or visitor use hours per recreational activity	A significant increasing trend or spike in recreation use not solely attributed to regular seasonal fluctuations in use
Level of Visitor Satisfaction	Change to the visitors' quality of experience while at New River	A significant increasing trend in the number of visitor encounters while on site, and/or the level of recreation impacts they observe; A significant decreasing trend in their ability to achieve solitude, and/or their overall quality of experience

Step 3. Monitoring Resource and Social Conditions

The routine monitoring of resource and social conditions is necessary to determine if changes are occurring. Although many natural resource-related projects within the ACEC are not directly linked to recreation use, a special monitoring component is being integrated into each project to help determine if recreational impacts are occurring. In addition to this general approach, more specific monitoring programs are in place to track changes to resource and social conditions that are directly related to visitor use.

Resource Conditions

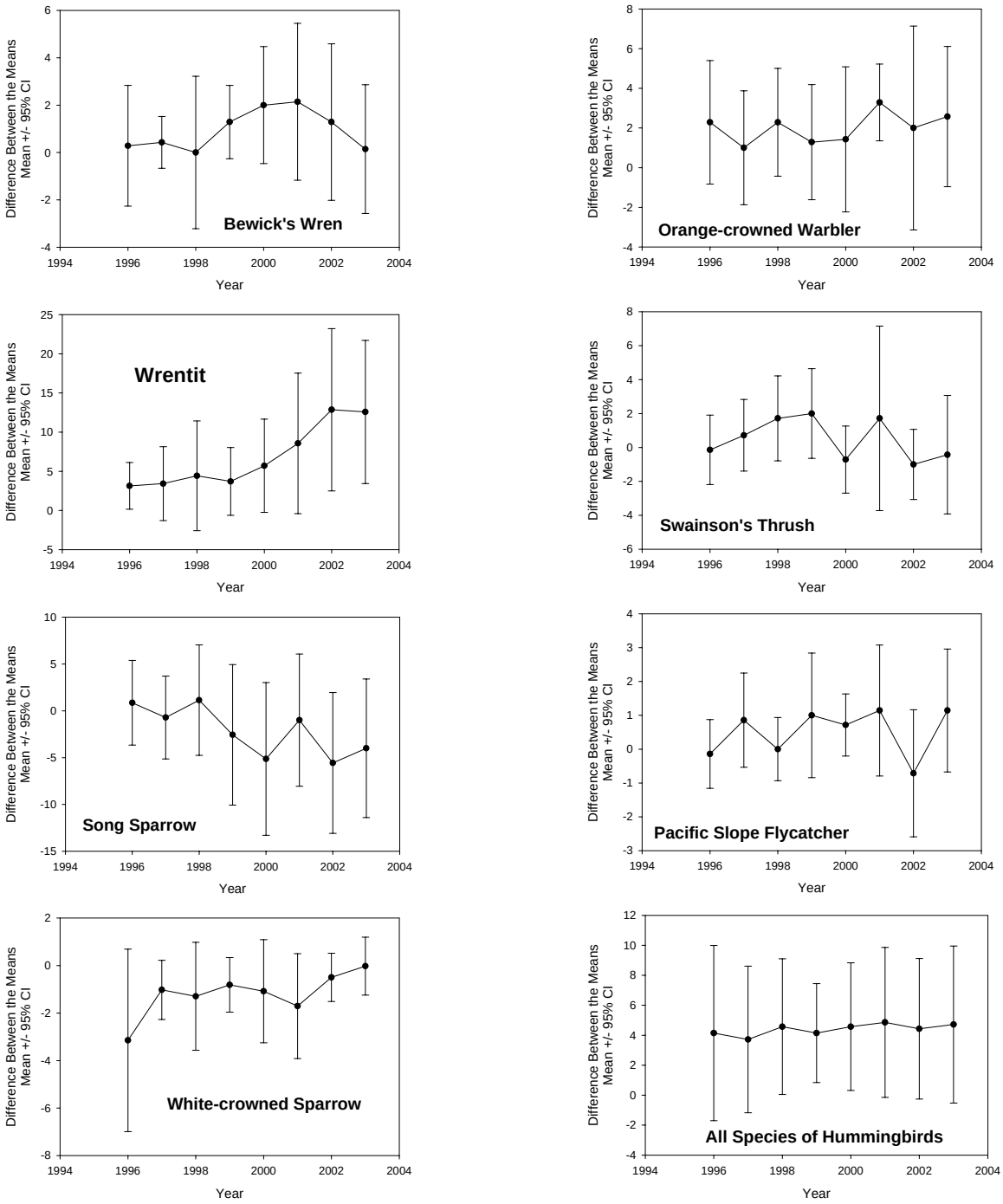
Programs currently in place to monitor the unique botanical, wildlife, and fisheries resources throughout the ACEC are primarily tied to habitat restoration and special status species recovery. These programs include: monitoring coastal dune habitat, riparian vegetation, river hydro-dynamics, the Western Snowy Plover, coho salmon, western lily, silvery phacelia, and pink sand-verbena. However, these programs are not specifically geared toward identifying the affects of visitor use activities. An exception to this is the recovery program for the snowy plover. An aspect of this program does monitor visitation, but the focus is measuring levels of noncompliance (i.e., dogs off leash, access within nesting areas, etc.).

There are two on-going programs that lend themselves well to monitoring visitor-use-related changes; the migratory song bird study and various photo point monitoring projects. The following describes these two programs that are used to gauge potential adverse impacts resulting from BLM-sanction recreation uses within the ACEC.

Since 1996, a monitoring program has been in place to monitor the conditions of eight species of breeding song birds that nest within the Storm Ranch portion of the ACEC (Rodenkirk 2003). This on-going project is used to establish a comparison between breeding bird species occurring in the vicinity of recreational trails and those occurring in off-trail areas. Since the population of each breeding bird species can vary from year-to-year due to external factors not related to conditions within the ACEC, the study is designed to show relational differences between control (off-trails) and treatment (along trails) areas. This is accomplished by comparing the difference between the mean number of detections of each species from year to year in both areas (Figure 9). For example, if the number of detections of a particular species fluctuates dramatically from one year to the next, but the relative difference in number of detections between the control and treatment areas are the same, then it is assumed that recreation use conditions have not significantly affected breeding song birds or their habitat within the ACEC.

A photo point monitoring program is in place to track changes to the condition of areas routinely used by visitors. These photo points are used to document and assess the status and trend of the physical environment. Photo points are landscape or feature photographs that are retaken from the same position at each observation. Over time, the differences between years can be compared qualitatively. These photo points assess habitat conditions in order to monitor changes in recreation impacts. Six photo points have been established along the road and parking areas of Storm Ranch, two photo points along New River, and thirteen photo points throughout the trail system. A description of the methodology used for this purpose can be found in the New River ACEC Recreation Use Photo Point Monitoring Plan (Brian 2002).

Figure 9. The following graphs compare the difference between the 'means' on control and treatment points for eight species of nesting song birds during the breeding season. The 'means' being compared are the average number of detections on all control and treatment points for one survey. These can be compared year-to-year to see if there is a significant difference. If the range of 'confidence interval' (CI) bars overlap from one year to the next, then there is no significant difference. Note that none of the individual graphs show significant differences to date.



Social Conditions

Tracking changes to the recreation settings (i.e., roaded natural and semi-primitive non-motorized) at New River is also a necessary component of the monitoring process. Within the Storm Ranch portion of the ACEC, visitor use data is collected based on the methodology described in the New River ACEC Visitor Use Monitoring Plan (Church 2001). Emphasis is placed on monitoring recreation use at Storm Ranch since it is the primary public access to the ACEC. Visitor use levels are recorded by the site host on ten randomly selected sample days each month. An estimate of monthly use by each recreational activity is then calculated based on these observations. The sampling plan began in May 2001 and is on-going.

Monitoring data is organized by both the number of visitors and the number of 'visitor use hours.' A 'visitor use hour' is a unit of measurement used to determine how long a visitor participates in a particular recreation activity. For evaluation purposes, this duration is broken down into 15-minute increments. For example if four visitors spend 15 minutes driving through the site, they have spent one visitor use hour on site. If two fishermen spend three hours on site, they have spent six visitor use hours on site. Comparing visitors with 'visitor use hours' helps determine potential issues and concerns that may result from a particular recreation use.

Figures 10 through 15 show the results of the visitor use monitoring effort thus far. This data is being used by the BLM to help focus other on-going monitoring efforts to determine if any impacts to the resource condition or social setting are occurring from changes in visitation.

Figure 10. Number of Sightseers per Month – includes sightseeing along roadway from or near vehicle, picnicking, viewing interpretive exhibits, and rest stops (May 2001 – April 2004)

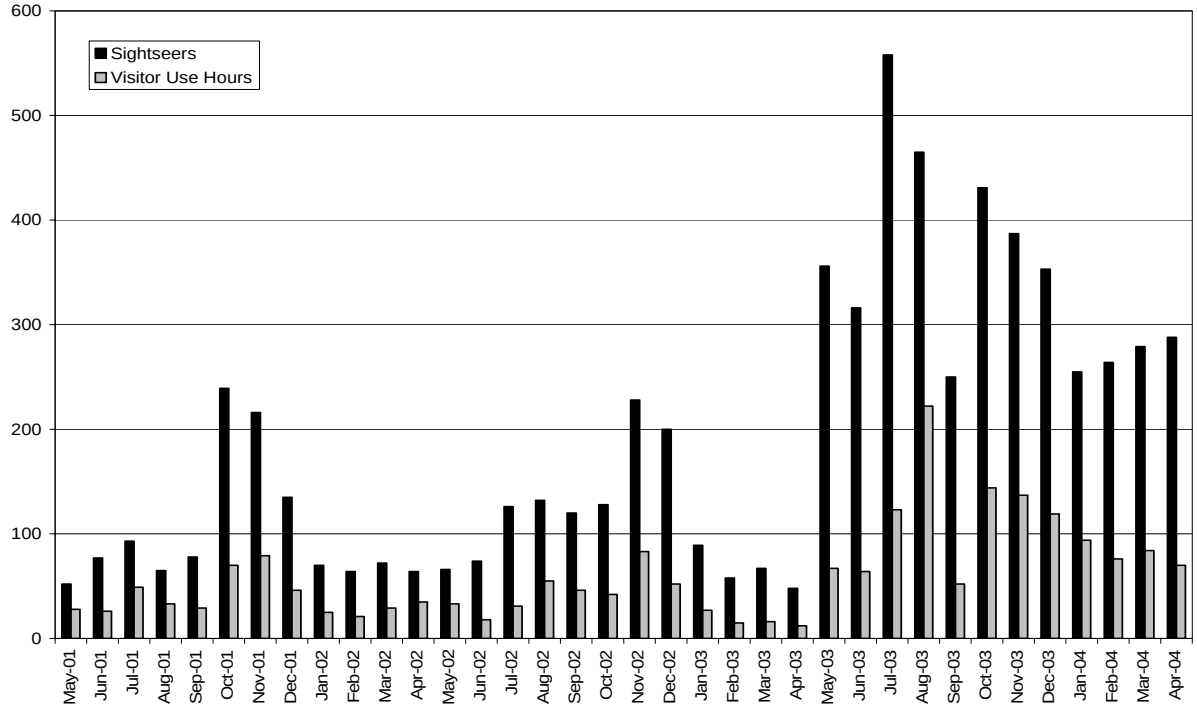


Figure 11. Number of Hikers per Month (May 2001 – April 2004)

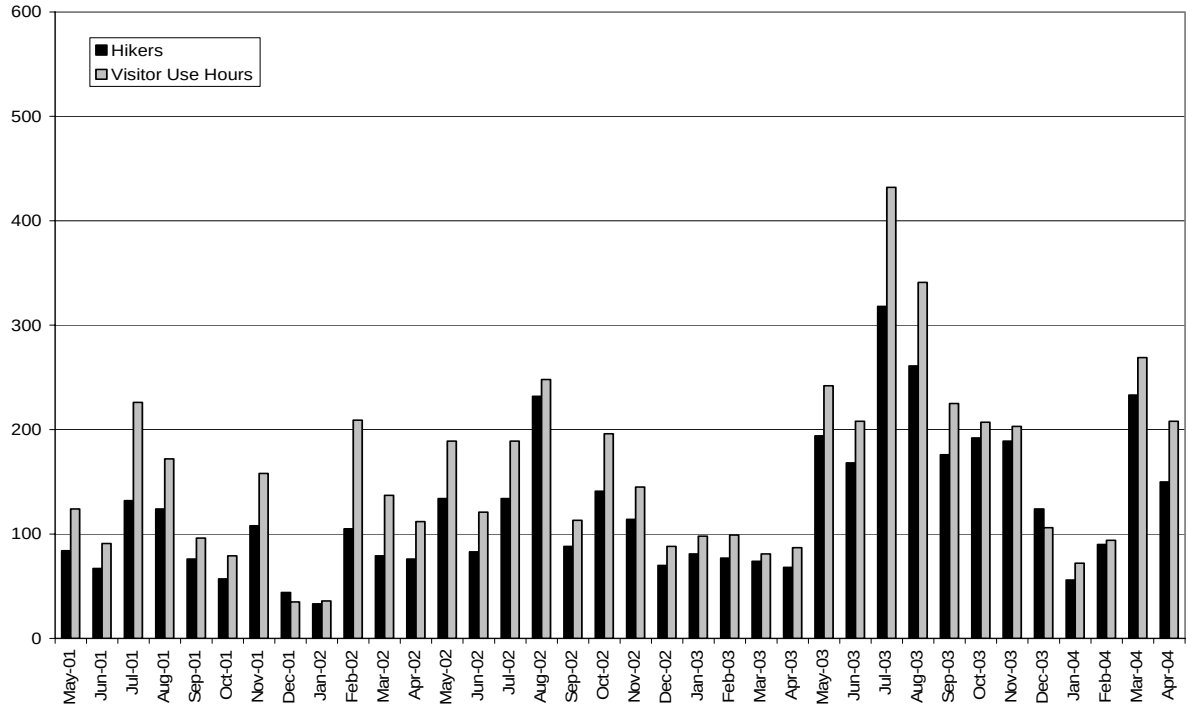


Figure 12. Number of Fishermen per Month – includes those using boats to access fishing areas along the river (May 2001 – April 2004)

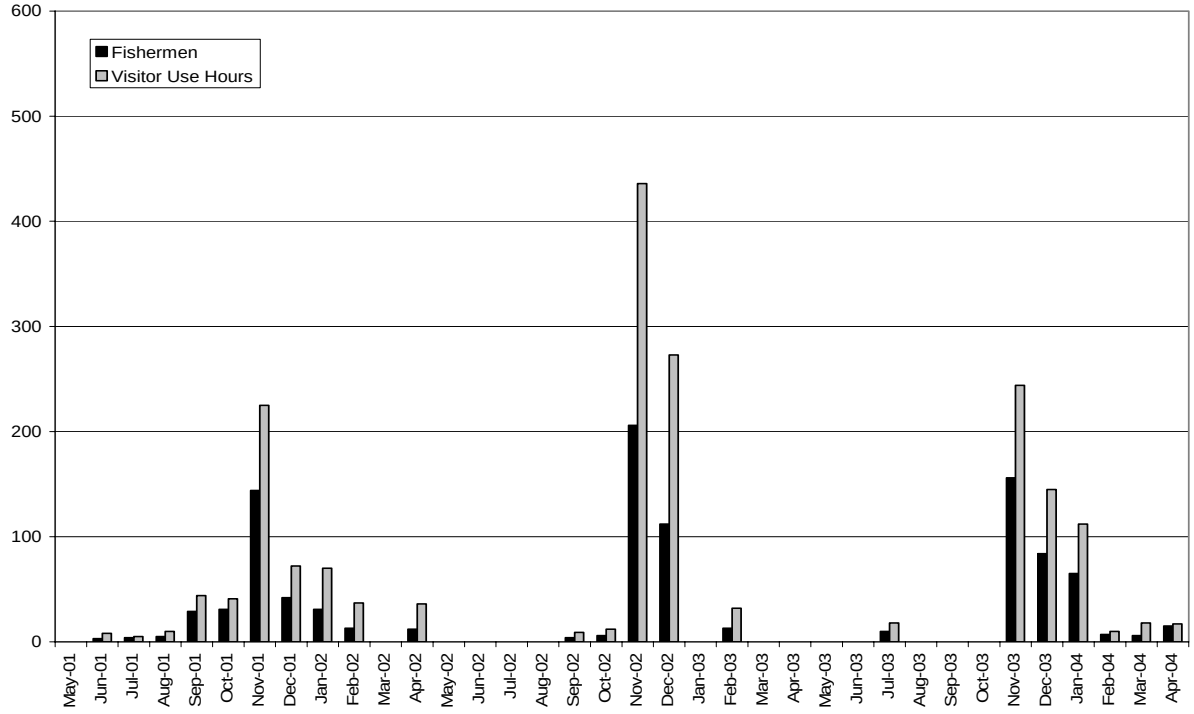


Figure 13. Number of Waterfowl Hunters per Month – includes those using boats to access hunting areas along the river (May 2001 – April 2004)

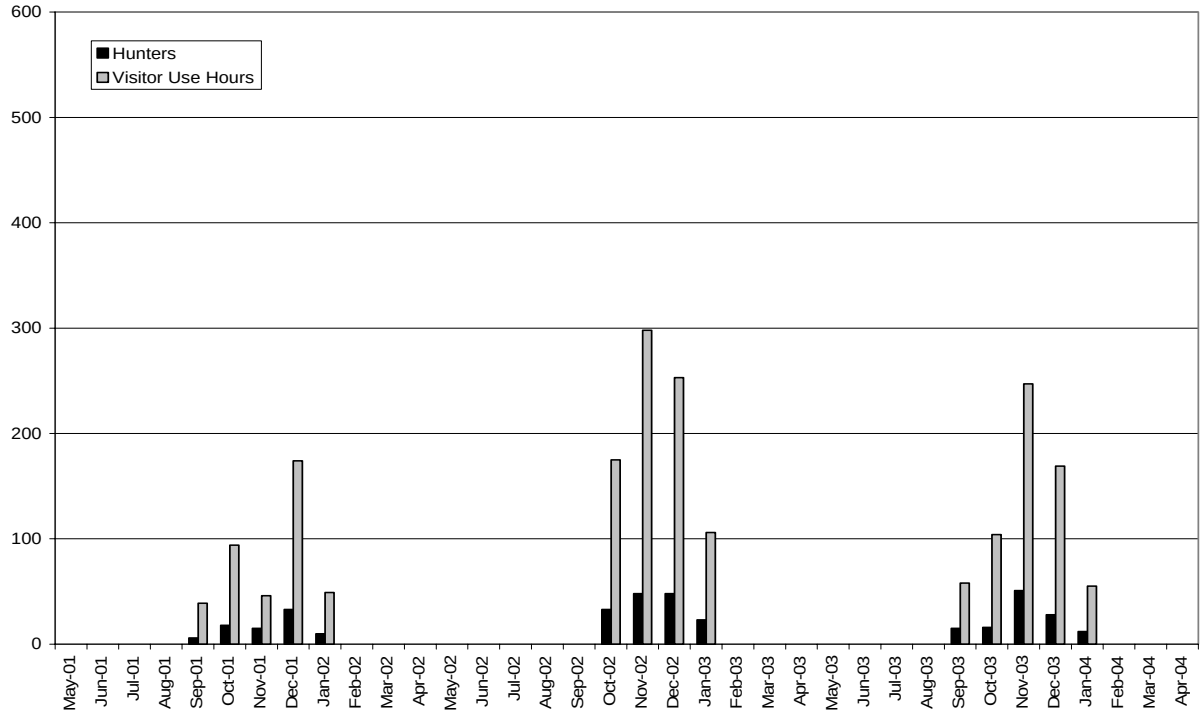


Figure 14. Number of Canoers or Kayakers per Month – excludes waterfowl hunters and fishermen with boats (May 2001 – April 2004)

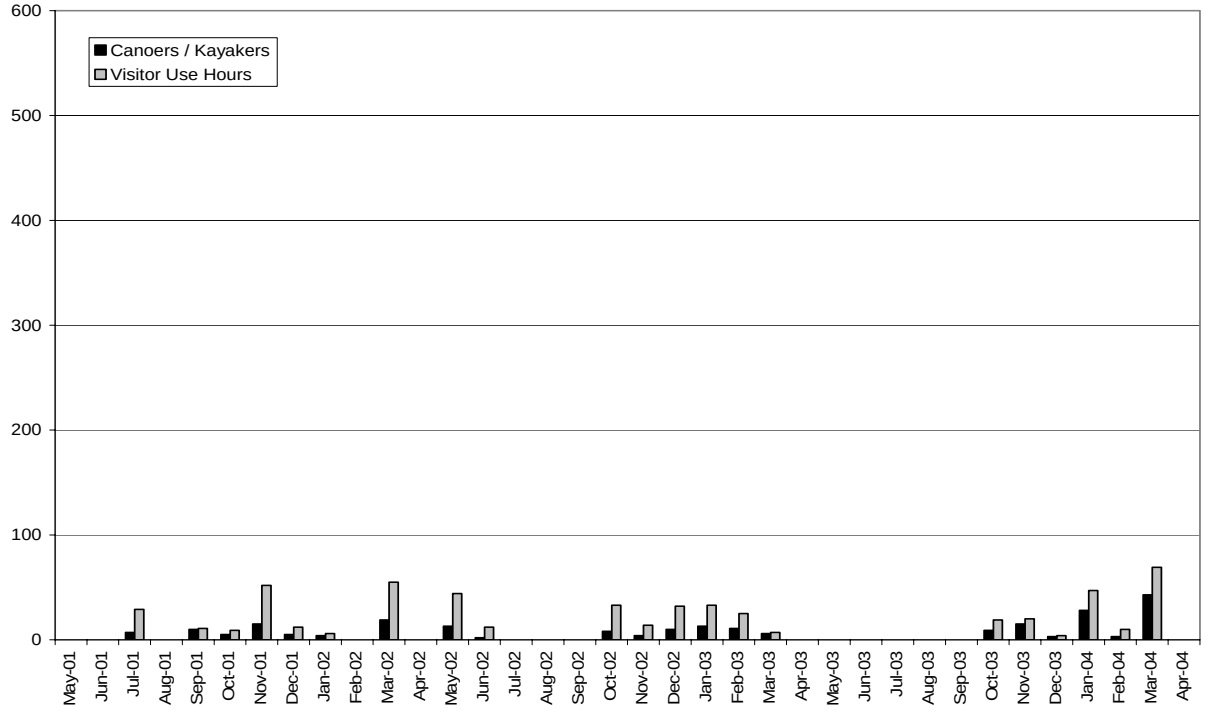
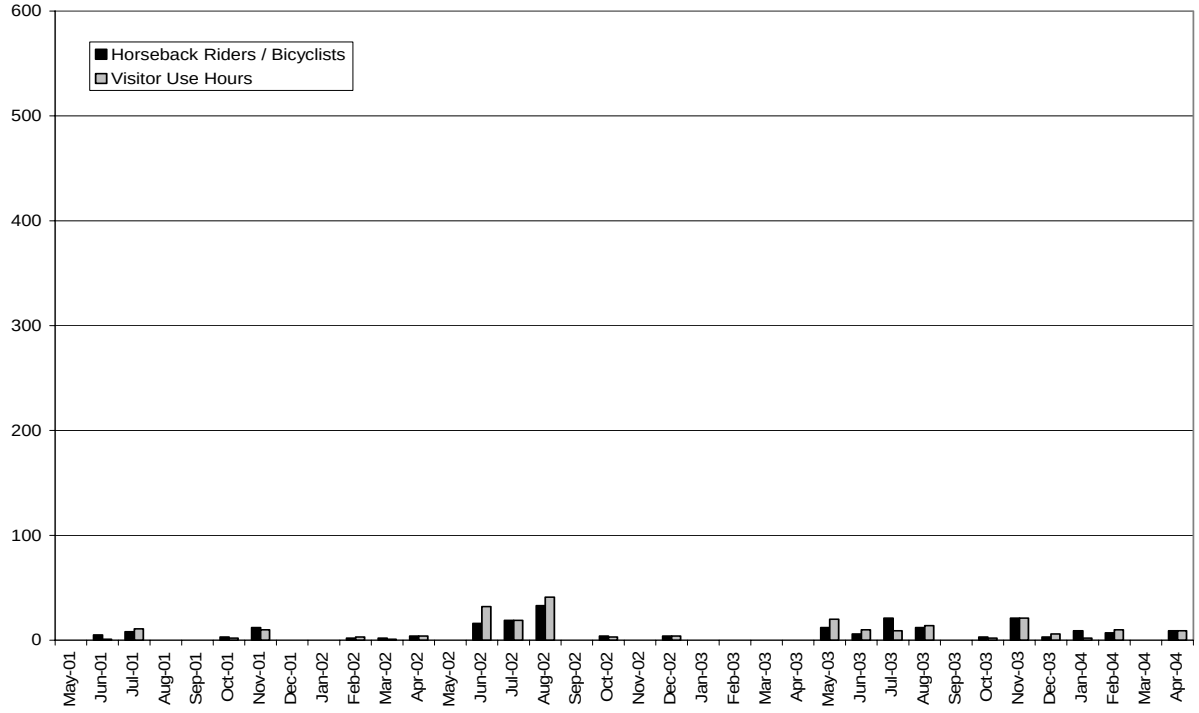


Figure 15. Number of Bicyclists and Horseback Riders per Month – these activities were combined on one graph due to their low visitor use levels (May 2001 – April 2004)



In addition to monitoring at Storm Ranch, seasonal employees collect data on visitor use levels at the Floras Lake portion of the ACEC during the summer snowy plover nesting season. Trail and road counters at this and other locations throughout the ACEC are also used to determine general visitor use levels throughout the year.

A visitor use survey is also in place to track changes to visitors' quality of experience while at New River. The survey is primarily designed to collect information about their impressions of the recreation settings (i.e., roaded natural and semi-primitive non-motorized) within Storm Ranch. It asks questions about: the number of visitor they encountered while on site; the level of solitude they achieved; concerns they have regarding resource impacts; the overall quality of their experience; and other questions relating to the types of activities they participated in, frequency of visits, distance traveled to the site, etc. The survey was first implemented in the summer of 2003 and is on-going. Key visitor responses from the 2003 survey are summarized below. (Church 2004)

Figure 16. New River Visitor Survey Results (August 2003 – April 2004, *based on 145 surveys*)

Survey Question: How many people (other than your group) did you see today in the following areas?
(Average number of people seen per visitor)

Main parking lot:	2.0
Boat launch area:	0.5
New River (away from boat launch):	0.2
Trails:	0.8

Was the number of other visitors in these areas too many for you to have a quality experience:
(Percentage of those who responded yes or no)

	Yes	No
Main parking lot:	3%	97%
Boat launch area:	1%	99%
New River (away from boat launch):	0%	100%
Trails:	0%	100%

Survey Question: Please circle the number that best reflects your opinion about New River:
(Percentage of those who responded yes per category)

Solitude is easily experienced at New River:

Strongly Disagree:	1%
Disagree:	3%
No Opinion:	8%
Agree:	13%
Strongly Agree:	75%

The level of natural resource impact from visitor use is currently low:

Strongly Disagree:	1%
Disagree:	2%
No Opinion:	14%
Agree:	21%
Strongly Agree:	62%

Survey Question: How do you rate the overall quality of your experience?
(Percentage of those who responded yes per category)

Excellent	72%
Good	25%
Fair	2%
Poor	1%

Step 4. Evaluate Changes and Selecting Alternative Management Actions

An interdisciplinary team will evaluate the results from monitoring resource and social conditions on an annual basis to determine if any significant changes are occurring. At a minimum, this team should include the ACEC manager, a recreation planner, botanist, and wildlife biologist. If necessary, other specialists may be needed to help address specific issues that may arise (e.g., fishery biologist, archaeologist, interpretive specialist, etc.). If the team determines a change is becoming unacceptable, they will recommend an alternative management action to reduce the resource impact or social conflict. Some of the management actions include gathering additional information to determine how significant a change is or how it relates to recreational use.

A list of alternative management actions has been developed to help resolve potential future issues (Table 12). These alternatives are suggestions for management and do not include all possible approaches. Alternatives were developed based on analyzing potential issues, concerns, and current conditions within the ACEC. The list of alternatives includes a progression of more stringent actions. Implementation of these actions should depend on the degree of social and/or resource impact. If less stringent actions are not effective at reducing the impact, then more rigorous management approaches should be considered. Once an alternative management action is selected, it will then be implemented and monitored to determine its effectiveness at reducing the resource and/or social concern.

Table 12. Alternative Management Actions

Setting	Alternative Management Actions
Throughout the ACEC	• Expand visitor use monitoring efforts / surveys to better define the current social conditions and the significance of any change in visitor use levels relative to social conditions (i.e., number of visitor encounters, types of social conflicts, degree of solitude, etc.). • Educate users about natural resource concerns and ways to reduce impacts while on site (i.e., hire an interpretive specialist to provide on-site programs, open learning center more regularly, provide guided hikes, etc.). • Encourage use outside peak visitation periods. • Determine if user conflicts or resource impacts are specific to a particular area, and if so, discourage use within that area (i.e., during breeding season or peak migration). • Determine if resource impacts are specific to a particular time of year or time of day, and if so, restrict or ration access during that time. • Provide additional interpretive or regulatory signs where needed to modify visitor behavior. • Increase law enforcement presence to encourage compliance with ACEC regulations. • Reduce number of visitors by establishing day-use fee, or issue permits/fees for certain recreational activities.
Roaded Areas	• Determine if the number of vehicles on site exceeds the maximum capacity of parking spaces available (if so, how often) • Install speed bumps, additional traffic signs, or other vehicle control measures • Limit the number of cars allowed to enter Storm Ranch during peak times if capacity is exceeded. • Revise or remove directional signs on Highway 101.

Setting	Alternative Management Actions
New River / other waterways	• Develop additional monitoring to determine if specific recreational activities are causing excessive disturbance to migratory birds, birds of prey, or other wildlife using the river. • Coordinate with ODFW to change fishing and/or waterfowl hunting regulations specific to New River. • Limit the number of waterfowl hunters accessing the river from Storm Ranch through the use of special use permits. • Coordinate with the Oregon State Marine Board to modify boating regulations to those more compatible with ACEC objectives.
Trails	• Encourage trail use during less crowded times to reduce number of encounters. • Install signs at key nesting areas along the trail to inform users to proceed with minimal noise/disturbance. • Encourage trail use outside of the breeding bird season. • Develop a more quantitative monitoring plan to evaluate the physical condition of the trails to determine if impacts are occurring. • Close or re-route sections of trail if excessive impacts occur. • Obliterate or discourage use of undesignated trails.

An Example of the Evaluation Process at Work

Results from the visitor use monitoring program show an increasing trend in sightseers after May 2003, when directional signs to the Storm Ranch portion of New River were installed on Highway 101. After further review of the data, it was determined that more people are visiting the site; however, a majority of them simply turn around at the main parking lot or take a quick rest stop before leaving. Note the difference between the number of sightseers and visitor use hours per month on Figure 2.

It was determined that an increase in vehicle traffic does not pose a measurable resource impact at this time, but it may affect the roaded natural setting of the area (e.g., traffic congestion in the parking lots and along road leading to the boat launch could reduce the opportunity for solitude). Based on anecdotal evidence, it was theorized that the 'Watchable Wildlife' logo (binoculars symbol) on the directional signs was somewhat misleading to travelers. This logo was originally designed to be used only for designated 'Watchable Wildlife' sites across the county. However, over the years it had been used by other agencies for all types of viewing areas, including: overlooks, scenic vistas, and other points of interest that can typically be seen from or near a vehicle.

Since wildlife viewing at New River is best approached by leaving your vehicle, BLM decided to change the binoculars logo on the highway signs to a hiking symbol in February 2004. The assumption is that less vehicle traffic will occur at New River if travelers along Highway 101 know ahead of time that the site does not offer a roadside viewing area. The visitor use monitoring program will continue to track these visitation changes over time to determine if this alternative management action is effective at reducing the amount of turn-around vehicle traffic.

Appendix I
Glossary

Aeolian: pertaining to the action or the effect of the wind, as in aeolian sand dune deposits.
Ammocoetes: juvenile lamprey, or larva; small, worm-like, and eyeless with filter-feeding mouths, gill slits, and narrow fins.
Area of Critical Environmental Concern: An area of BLM-administered lands where special management attention is needed to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes; or to protect life and provide safety from natural hazards (as defined in BLM Manuel 8300).
Bankfull: (1) The water level where the stream channel is flowing full, or just starts to overflow its natural banks. (2) A concept used in hydrologic analysis and geomorphology where the bankfull stage is identified (not necessarily at the top of a natural bank) and related to a certain return interval flow event.
Biodiversity: the full range of variety and variability within and among living organisms and the ecological complexes in which they occur.
Biome: a complex community of all living organisms, (e.g., grassland biome, woodland biome).
Bog: a wetland in which the water is acidic and comes only from precipitation that is relatively mineral-poor compared to groundwater; the substrate is accumulated organic material derived primarily from *Sphagnum*, graminoids (grasses, sedges, and rushes), and Ericaceous shrubs.
Breach: term used in this plan to explain an opening in the foredune between New River and the Pacific Ocean, caused by floodwaters, ocean surf run-up, or by planned mechanical intervention.
Cascadia seismic event: a rupture of the interlocked North American Plate and the Juan de Fuca Plate along the subduction planes. The energy released is expected to generate an 8.8 magnitude earthquake.
Cascadia subduction zone: the generally north-south zone along the Northwest coast where the Juan de Fuca Plate is being over-ridden by the North America Plate.
Cell: a unique ecosystem type of one or more ecosystem elements used to describe and evaluate natural areas.
Climax community: final or stable plant community in a successional series.
Community: a group of plants and animals that occupy a given locale.
Confidence interval: a statistical range with a specified probability that a given parameter lies within the range.
Coniferous: cone-bearing trees or shrubs; mostly evergreens such as pine, cedar, spruce, etc.
Cubic foot per second (cfs): a unit of measurement of the rate of water flow past a given point equal to one cubic foot in one second.
Deflation plain: area behind the foredune where wind has eroded the sand to the water table, forming a wet surface resistant to further erosion.
Disclimax: an enduring climax community altered by man's disturbance.
Dissipative beach: a portion of the shoreline that has a relatively gentle grade, the grain size is small, and is considered "more" stable.
Dune: a hill of drifting sand formed by wind action.
Ecosystem: an assemblage of integrated organisms plus the local environment.
Estuary: the zone between the fresh water of a stream and the salt water of an ocean. An estuarine system extends upstream until ocean derived salt measures less than 0.5% during average annual flow. Estuaries are low energy systems and may include subtidal and intertidal areas with aquatic beds.
Estuarine: of, relating to, or found in an estuary.
Exotic: introduced species; not indigenous to a given area.
Fen: a wetland in which the water is alkaline to only slightly acidic and has been in contact with mineral soil; the substrate is accumulated organic material derived primarily from graminoids (grasses, sedges,

and rushes) and bryophytes other than Sphagnum. In Oregon, there are apparently no truly natural bogs, and the acidic wetlands with *Sphagnum* are classified as poor fens.
Flow Duration: the relationship between the magnitude of stream flow and the proportion of the time being considered during which the flow was equaled or exceeded.
Foredune: an elevated accumulation of sand at the landward margin of the beach, usually stabilized by vegetation, primarily European beach grass. The tall ridges may reach heights of 25 to 35 feet and basal widths of over 320 feet.
Geomorphology: the science of the configuration of the earth's surface; the classification, description, nature, origin, and development of landforms and their relationships to underlying structures; and the history of geologic changes as evidenced in these surface landforms.
Good Friday Earthquake, 1964: a tectonic event that originated in Alaska. The earthquake occurred on March 27, 1964, Good Friday and was a 9.2 magnitude, the second largest earthquake ever recorded. The earthquake triggered a tsunami that impacted Pacific coastlines including Oregon, California, Washington, and Alaska.
Herbicide: a chemical substance capable of killing or inhibiting plants.
Interpretation: a communication process that forges emotional and intellectual connections between the interests of the audience and the inherent meanings in the resource.
Introduced species: also referred to as exotic species, these are plants or animals occurring as a result of introduction or unnatural range expansion. These are species that did not occur before the arrival of European culture.
Littoral cell: segment of the shore or beach that is bound by headlands which extend sufficiently seaward to prevent along-shore transport of beach sediment, creating a relatively closed sediment system.
Mean: a number that typifies a set of numbers, such as a geometric mean or an arithmetic mean; the average value of a set of numbers.
Mélange: a body of rock large enough to be mapped that includes fragments and blocks of other rock, both exotic and native, embedded in a fragmented and sheared matrix.
Metamorphic: a rock that has been subject to alteration of its original mineralogical, chemical, and structural characteristics due to pressure and/or heat.
Metasediment: a sediment or sedimentary rock that has evidence of being subject to partial or complete metamorphism.
Morphology: the study of the shape of the earth's surface including structure, form, and arrangement in relation to the development of landforms.
Native: a species indigenous to a given area; any species known to occur before the arrival of European culture or which has moved in through natural range extension.
Neotropical: of or originating from the biogeographic region stretching southward from the Tropic of Cancer and including southern Mexico, Central and South America, and the West Indies.
Non-vascular: refers to the lichens, fungi, liverworts, hornworts, and mosses.
Noxious weeds: any plant designated by the Oregon State Weed Board that is injurious to public health, agriculture, recreation, wildlife, or any public or private property.
Peak Flow: the maximum rate of discharge at a given point or from a given area, during a specified period.
Plagioclase: any of a common rock-forming series of triclinic feldspars, consisting of mixtures of sodium and calcium aluminum silicates.
Plant community: a general term for an assemblage of plants growing together at a site which show a definite association or affinity to each other
Pleistocene: in the geologic time scale, an epoch or period of the Quaternary. Its time frame is given as two to three million years before present until the beginning of the Holocene, approximately 8,000 to 10,000 years before present.
Precipitation ridge: the leading landward edge of a dune field at the point of advancement of the dune.

Quaternary: the second period of the Cenozoic era, made up by the Pleistocene and Holocene epochs. Its time frame is given as two to three million years before present until present.
Reach: a river or stream segment containing similar physical and biological characteristics.
Reflective beach: a portion of the shoreline that has a relatively steeper grade, composed of a larger grain size, and is considered less stable.
Riparian: living on or adjacent to a water supply such as a riverbank, lake, or pond.
Riverine: relating to or resembling a river, in this case a coastal freshwater system.
River mile: the measurement of distance in miles along a river beginning at the mouth or at the confluence of a higher order tributary.
Special Recreation Management Area: An area where a commitment has been made to provide specific recreation activity and experience opportunities. These areas usually require a high level of investment and/or management. They include recreation sites, but recreation sites alone do not constitute SRMAs (as defined in BLM Manuel 8300).
Special status species: animals and plants considered being of conservation interest because of their rarity or vulnerability to extirpation or extinction, or they are under-represented in protected areas.
Succession: the transition of plant species of a given area through a definite ecological stage (e.g., through succession of species composition, grasslands become tree-bearing forests).
Terrace: a wave-cut platform that has been exposed by either a land uplift or lowering of the sea level.
Terrestrial ecosystem: the name given to an assemblage of land-based species in a given locale, possessing some degree of interrelationship, generally reflected in consistency in dominant species and environment.
Threatened species: plants and animals listed as threatened on the Endangered Species List that are in danger of becoming extinct.
Vascular plants: refers to vessels or ducts that conduct fluids in plants; includes the fern and fern allies, gymnosperms, dicotyledons, and monocotyledons.
Visitor Use Hour: a unit of measurement that defines the amount of time a visitor(s) participates in a recreational activity (two visitors who spend three hours boating equals six visitor use hours).
Wetland: an area subjected to periodic inundation, usually with soil and vegetative characteristics that separates it from non-inundated area.

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