

Chapter 5. Public Use Programs and Impact on Social and Economic Environment

5.1 Public Infrastructure and Administrative Facilities

The infrastructure and facilities discussed in this section include boundary signs, public entrances, roads, trails, and administrative buildings. Facilities associated with specific public use programs are discussed in section 5.2. All public and administrative facilities, with the exception of boundary signs, are depicted on the maps located in chapter 2: Figures 2-1 (North Coast); 2-2 (Central Coast); 2-3 (South Coast); 2-4 (Cape Meares detail); 2-5 (Three Arch Rocks detail); and 2-6 (Oregon Islands Coquille Point Unit detail).

5.1.1 Boundary and markers

5.1.1.1 Oregon Islands NWR

All refuge rocks, reefs and islands are closed to public use. The Service requests all aircraft to maintain a 2,000-foot (610-meter) minimum AGL altitude over all National Wildlife Refuges including the rocks, reefs and islands along the Oregon coast in order to minimize disturbance to seabirds, pinnipeds and other wildlife. The minimum altitude request, notice to pilots and the majority of the refuge rocks, reefs and islands are printed on the two FAA Sectional Aeronautical Charts that cover the Oregon coast. The 18.52 acre Coquille Point Unit is not posted with standard boundary signs. The boundary of the 133.71 acre Crook Point Unit is approximately 50% posted.

5.1.1.2 Three Arch Rocks NWR

The refuge is closed to public use. To protect wildlife during the breeding season, waters within 500 feet of the refuge are closed to all watercraft from May 1st through September 15th by an Oregon State Marine Board closure (Oregon Revised Statutes 830.110 and 830.175). Buoys are deployed annually to mark the seasonal water closure. The requested 2,000-foot (610-meter) minimum AGL altitude over Three Arch Rocks is also printed on all FAA sectional aeronautical charts that cover the Oregon coast.

5.1.1.3 Cape Meares NWR

This Refuge and RNA has a total size of 138.5 acres. Approximately five percent of this boundary is posted. Boundary signs are located primarily where refuge lands are adjacent to roads and OPRD lands.

5.1.2 Entrances, access points, roads and parking

5.1.2.1 Oregon Islands NWR

There are no entrances, roads or vehicle parking areas on any of the rocks, reefs and islands. There are four entrances to the Coquille Point Unit of the refuge. Two of the entrances permit vehicular access and parking. The unit's primary entrance is located at the western end of NE

11th Street in the City of Bandon. The Complex maintains a parking lot for visitors at the main entrance and a second, unofficial entrance (dirt path) is located at the western end of NE 8th Street and is managed by the City of Bandon. Two staircases located on the unit's primary entrance provide pedestrian access to the adjacent OPRD managed ocean shore.

The Crook Point Unit is closed to all public entry. There is one entrance road that permits vehicular access to the unit. This road is privately owned up to the Crook Point Unit boundary and the Service has a road easement through private property to maintain this access route. The unit can also be accessed from the public beach to the west. Pistol River State Park is adjacent to the north boundary of the Crook Point Unit and there is an abandoned horse trail leading from the state park that is used on occasion to trespass on this unit.

5.1.2.2 Three Arch Rocks NWR

There are no entrances, roads or vehicle parking areas on this refuge as it lies a half-mile offshore, west of the town of Oceanside.

5.1.2.3 Cape Meares NWR

There are three entrances to the refuge. One permits vehicular access and two are accessible to pedestrians. The vehicular access road (Lighthouse Drive) is located just off and to the west of the Three Capes Scenic Loop. The road is maintained by OPRD and provides access to both the refuge and the Cape Meares State Scenic Viewpoint. The road ends in a parking lot recently expanded and upgraded by the Refuge Complex, but maintained by OPRD and includes 36 spaces for cars and three designated spaces for Recreational Vehicles and Tour buses. One of the pedestrian access points is located at the entrance to Cape Meares; the other is to the north of the refuge through county lands, accessed from the town of Cape Meares.

5.1.3 Trails

5.1.3.1 Three Arch Rocks NWR

There are no trails because the refuge is closed to public entry.

5.1.3.2 Oregon Islands NWR

The Coquille Point Unit has a half-mile self-guided, paved interpretive trail that is accessible to people with disabilities.

5.1.3.3 Cape Meares NWR

There are two hiking trails within Cape Meares NWR. Both are one-way, unpaved trails and they are not accessible to people with disabilities. One of the trails is a quarter-mile long and ends at a giant old-growth Sitka spruce. A longer trail approximately two miles in length is part of the Oregon Coast Trail. From the trailhead it winds in a northerly direction through an old-growth Sitka spruce and western hemlock forest, a red alder meadow, and ends on a county road south of the community of Cape Meares. The trail through Cape Meares NWR was once much longer than the present configuration. The trail once extended from the town of Cape Meares south to Lighthouse Road as it currently does, then continued around the east, north, and west sides of the

north unit of the refuge, terminating in the parking lot of the Cape Meares Scenic Viewpoint. From January 5-9, 1990, Cape Meares was pounded by a series of powerful Pacific storms resulting in a catastrophic blowdown of trees and landslides. Approximately 200 feet of the trail on the north slide was lost in a slide. Prior to rebuilding or relocating the trail, it was discovered that a pair of bald eagle (a threatened species at the time) had relocated their nest within 15 feet of the trail with the tree canopy extending over the trail. In addition, detections of federally threatened marbled murrelets occurred in this same area the previous two breeding seasons. Out of concern that public disturbance could impact the nesting bald eagles, marbled murrelets, and other listed species, the trail was temporarily closed in 1990. In January 1991, the Refuge Complex consulted with wildlife experts from OSU, ODFW, and the U.S. Forest Service and subsequently prepared an Intra-Service Section 7 Evaluation (dated March 14, 1991). The conclusion of the Section 7 Evaluation was to permanently close this section of the trail to provide maximum protection to threatened and endangered species.

5.1.4 Administrative facilities

The Oregon Coastal Field Office is located within the Hatfield Marine Science Center and houses the Refuge Complex headquarters and the Service's Newport Ecological Services Field Office. The administrative facilities consist of a small interpretive display, two labs, a large meeting room, office space for 12 permanent employees and 2-4 temporary employees, and a maintenance shop/garage. The Oregon Coastal Field Office provides three enclosed vehicle/boat bays.

A south coast administrative facility is located in Bandon, Oregon, on Bandon Marsh NWR. The facility complex consists of an office building for the South Coast Refuge Manager, with office space for the Friends of Southern Oregon Coastal Refuges, a detached garage with three bays, and a nearby maintenance shop with four bays. There is a five bedroom bunkhouse with a detached garage located adjacent to the refuge office. In addition, the facilities complex contains a two bedroom doublewide manufactured home, an adjacent three bay shop building, and two RV sites on lands within the Smith Tract of Bandon Marsh NWR. The bunkhouse, manufactured home, and RV sites serves as housing for refuge volunteers, visiting staff, and researchers.

5.1.5 Easements and rights-of-way

5.1.5.1 Oregon Islands NWR

At the Crook Point Unit, the Service has an easement from U.S. Highway 101, west to the entrance of the unit across private property for egress and ingress purposes. The southern 10 acres of the unit is under a 75-year lease (initiated in 2000) to the former owners where a residence and associated storage building is located.

5.1.5.2 Cape Meares NWR

In June 1971 the Service granted a road right-of-way easement to the Oregon State Highways Division for a 50-year period. The easement covers all of the Three Capes Scenic Route that bisects refuge land.



Observation deck with visitors. (Roy W. Lowe/USFWS)

5.2 Public Use Overview

The Oregon Coast is one of the most popular tourist destinations in the State with over 25 million visitor-use days each year. Wildlife observation is an activity that many visitors engage in during their visit. The Pacific Coast Scenic Byway (U.S. Highway 101) runs the length of the Oregon Coast, providing dramatic views of the rocky coastline, pastoral scenes through verdant farmland, and educational excursions at nature-based interpretive centers. The Complex provides funding for and manages a variety of both onsite and offsite facilities for hundreds of thousands of visitors to view wildlife. The Refuge Complex has one full-time staff member dedicated to the public use program and uses volunteers on both a seasonal and year-round basis to assist with site-specific interpretation programs and environmental education for targeted audiences.

5.2.1 Current public uses and wildlife dependent public uses

5.2.1.1 Oregon Islands NWR

The coastal rocks, reefs and islands are closed to public use to protect wildlife, which is sensitive to human disturbance, and to protect fragile habitats. Wildlife photography, observation and interpretation are existing public uses of Oregon Islands that occur at many off-site mainland areas owned and managed by city, county, state and federal agencies, as well as on-site at the Coquille Point Unit. To facilitate off-site public use, the Complex has enhanced wildlife viewing opportunities on several mainland areas that overlook refuge rocks and islands at sites managed

by OPRD. To facilitate interpretation, volunteer wildlife interpreters are stationed at several key viewing locations on the coast. They orient visitors, help them to become aware of the wildlife resources using the rocks and islands, and educate them as to how they can reduce negative wildlife/human interactions. Oregon Islands NWR overlook sites with volunteer interpreters include Haystack Rock at Cannon Beach, Yaquina Head Outstanding Natural Area, Heceta Head State Scenic Viewpoint, Coquille Point Unit of Oregon Islands NWR, Simpson Reef Overlook at Shore Acres State Park, and Harris Beach State Park. From mid-April through August, refuge volunteers interpret at least four days per week and in some cases provide full coverage seven days a week.

When volunteers aren't available or locations aren't appropriate for volunteers, a series of interpretive panels, located on private, city, county, state and federal lands, offer self-guided interpretation about Oregon Islands NWR. Excellent refuge wildlife observation and photography opportunities are available to visitors from an untold number of off-site viewing decks, highway pullouts, and beach locations along the entire Oregon coast.

The Service and the BLM have been working cooperatively since the early 1980s to protect the wildlife resources of YHONA and the adjacent rocks within Oregon Islands NWR. The existing MOU for YHONA signed in 1985, is a three-party agreement among the Service, BLM, and USCG. When the MOU was established, USCG managed the lighthouse and 10 acres of the site. With the exception of a dilapidated stairway to Cobble Beach, BLM did not have any structures or facilities on the headland and only one seasonal employee was present during the spring and summer months. At this time the public was accessing many of the cliff edges and rocks within the refuge, frequently disturbing harbor seals and preventing seabirds from nesting in these areas.

Since establishment of the MOU, BLM has developed the headland for wildlife viewing, photography, interpretation and environmental education. In addition, BLM has added permanent staff on site as well as seasonal employees and volunteers. Complex staff members have worked with BLM's employees and volunteers to identify life history information on seabirds and harbor seals to share with the visiting public, and also to identify and prevent human disturbance to wildlife. In recent years, the Refuge Complex has begun stationing refuge volunteers at YHONA in spring and summer to assist BLM in interpreting the natural resources of the headland and adjacent refuge rocks. Working in concert with Complex staff members, BLM has restricted and enforced where the public is allowed to go on the headland to protect wildlife and visitors.

Working in close cooperation with BLM over the past two decades has resulted in the protection of existing seabird colonies and a harbor seal haulout site, and has provided for dramatic population increases in nesting seabirds and the colonization of new sites on the mainland and refuge rocks. Public use of YHONA is high, exceeding 350,000 visitors annually and this site is now one of the premier seabird viewing locations in the country, providing the public opportunities for wildlife resource interpretation and environmental education.

The Coquille Point Unit is open to public use. One of the purposes for acquisition of Coquille Point was to provide opportunities for public use, and the site is popular with both local wildlife enthusiasts and out of town visitors. Existing wildlife-dependent public uses include wildlife observation, photography, interpretation, and environmental education. Onsite facilities managed



Yaquina Head Outstanding Natural Area (YHONA). (Roy W. Lowe/USFWS)

by the Complex include an orientation kiosk; a self-guided, accessible, paved hiking trail; two sets of stairs that provide beach access from the headland; a parking lot and interpretive panels. Coquille Point receives over 300,000 visitors annually and this number is growing. In 2007, refuge volunteers whose task was to provide interpretation to the visitors on off-site locations, devoted 6,422 hours and personally spoke to more than 122,000 people about refuge resources. Wildlife observation and photography opportunities are available to visitors from the self-guided trail, the parking lot, and the south coast stairs. Complex staff members, the Friends of the Southern Oregon Coast Refuges, and refuge volunteers also provide environmental education programs to local schools that request the programs.

The Crook Point Unit is closed to public use to prevent disturbance to nearby off-shore wildlife habitat that harbors tens of thousands of colonial burrow-nesting seabirds and a number of loafing pinnipeds, and to protect sensitive cultural resources and rare native plants.

5.2.1.2 Three Arch Rocks NWR

The refuge is closed to public use to protect seabirds, pinnipeds and their habitat from human disturbance. However, wildlife observation, photography, and interpretation are existing public uses of the refuge that occur off-site at Cape Meares State Scenic Viewpoint and Oceanside Beach State Recreation Area. Interpretation of the refuge is conducted through two interpretive panels,

one located at each of the two sites identified above. In 2007, more than 300,000 people participated in at least one of the three public use opportunities offered off-site.

5.2.1.3 Cape Meares NWR

The Cape Meares Refuge partially surrounds Cape Meares Lighthouse and State Scenic Viewpoint which offers almost 500,000 yearly visitors a variety of activities. The refuge itself is mainly closed to public use except for two hiking trails that traverse through a section of the refuge. Existing wildlife-dependent public uses on the refuge's hiking trails include wildlife observation and photography. In turn, wildlife photography, observation, and interpretation are existing public uses that occur off-site on Cape Meares State Scenic Viewpoint. The Complex has improved the public use facilities at the State's Scenic Viewpoint to facilitate off-site, wildlife-dependent public use with the goal of minimizing wildlife disturbance on refuge lands and enhancing the public's understanding of the sensitivity of coastal wildlife to human disturbance. Off-refuge facilities include a parking lot, two accessible viewing decks, interpretive panels, and a welcoming kiosk. To offer personalized interpretation, volunteer wildlife interpreters are stationed on the north viewing deck annually from May through August. The volunteers orient visitors, help them to become aware of the wildlife resources using the rocks and islands, and educate them as to how they can reduce negative wildlife/human interactions. In the past five years, volunteers have annually dedicated more than 400 hours to speaking with more than 10,000 visitors about the refuge's wildlife.

5.2.2 Annual refuge visitation

Visitation numbers for the refuges gathered from the 2007 Refuge Annual Performance Plan are discussed in the following paragraphs. It is notable that the majority of public use on the refuges occurs between May and September.

5.2.2.1 Oregon Islands NWR

Of the three marine refuges, Oregon Islands Refuge receives the most visitation. Most of the public use occurs off-site on the mainland. Annual visitation increases by a minimum of 5% annually. In 2007, more than two million people participated in at least one of the four public use opportunities offered off-site. The Coquille Point Unit received over 300,000 visitors. Coast wide refuge volunteers whose task it is to provide interpretation to the visitors at off-site locations, devoted 6,422 hours and personally spoke to more than 122,000 people about refuge resources.

5.2.2.2 Three Arch Rocks NWR

All public use occurs at two off-site locations: Cape Meares State Scenic Viewpoint and Oceanside Beach State Recreation Area. Approximately 300,000 people participated in at least one of the three public use activities offered off-site.

5.2.2.3 Cape Meares NWR

Visitation to Cape Meares NWR and State Scenic Viewpoint continues to increase by 10% annually. Visitation was at 490,000 in 2007 with most of the visitors participating in wildlife observation and interpretation. Approximately 5% of those visitors engaged in wildlife photography. All of these public uses occur off-site on the adjacent OPRD lands within Cape

Meares State Scenic Viewpoint. In 2007, two volunteers dedicated 438 hours to speaking one-on-one with over 10,500 visitors about the refuge's wildlife.

5.2.3 Open and closed areas

5.2.3.1 Three Arch Rocks NWR

The refuge is closed to public use.

5.2.3.2 Oregon Islands NWR

All refuge rocks, reefs and islands are closed to public use. The Coquille Point Unit is open to public use year-round, daylight hours only. The Crook Point Unit is closed to all public use.

5.2.3.3 Cape Meares NWR

The refuge is closed to public use except for the trail system (see 5.1 C) which traverses a section of the refuge.

5.2.4 Accessibility of recreation sites and programs for people with mobility limitations

5.2.4.1 Oregon Islands NWR

The Coquille Point Unit provides a half-mile self-guided interpretive trail that is accessible for people with disabilities. In 2003 the Refuge Complex provided the funding for a much-needed upgrade to the visitor use facilities at Simpson Reef Overlook, located within Shore Acres State Park. The upgrade, which included a redesign of the parking lot and the viewing deck, made the facilities accessible for people with disabilities.

5.2.4.2 Cape Meares NWR

The Refuge Complex provided the funding to improve the parking lot and construct two viewing decks at Cape Meares State Scenic Viewpoint. These upgrades and new construction increased the amount of parking and made these facilities accessible.

5.2.5 Public use opportunities and recreation trends on the Oregon Coast

Oregon's abundant outdoor recreation opportunities contribute both to the state's quality of life by providing accessible outdoor experiences, and to the economy by stimulating demand for local services, thereby creating jobs and income. Hiking, fishing, whale watching, tidepool exploring, photography, storm-watching, birding, cycling, kite flying, scuba diving, clamming, crabbing, camping, surfing, and beachcombing are among some of the outdoor activities that draw people to the Oregon coast. Residents and non-residents engage in these outdoor recreation opportunities which form the basis for a growing tourist industry, especially in rural areas.

Comparing the 1986 -1987 Pacific Northwest Outdoor Recreation Study to the 2003-2007 Oregon State Comprehensive Outdoor Recreation Plan (SCORP) shows that the most significant

participation growth activities in the state of Oregon include nature/wildlife observation (over 170 percent growth), golf, RV/trailer camping, and sightseeing/driving for pleasure.

In terms of tourism on the coast, the north and central coast of Oregon receives the most visitors. Easy accessibility from larger urban areas along the I-5 corridor makes these two regions very popular with sightseers. The Oregon south coast is associated with more active pursuits of fishing and motorized off-road sports. Two of the state's best fishing destinations, the Umpqua and Rogue rivers, are located in this region. Scenic areas also make the south coast a sightseeing destination, but the area is relatively distant from urban areas and Interstate 5, resulting in fewer sightseers visiting these areas as compared to the north and central coast.

National Wildlife Refuges in Oregon provide the public with opportunities to view and photograph wildlife in their natural habitats in a variety of ecosystems. In 2007, over 2 million people visited National Wildlife Refuges in Oregon. The majority of those viewed the seals, sea lions, and seabirds of the Oregon Islands NWR (OPRD 2003). A study issued by the Service reported that traveling visitors seek new outdoor recreational opportunities and opportunities for solitude. Visitors felt that many of the popular federal land management agencies' facilities were too crowded and regulated. The refuges in Oregon and other states are starting to attract visitors seeking solitude and new outdoor recreational opportunities. This follows a trend discovered during data collection for the 2003-2007 SCORP where the public is asking land managers to place an increasing emphasis on protecting streams, fish, wildlife habitat, and threatened and endangered species. They are also asking land managers to manage for amenities including quiet, natural places, natural appearing settings, and information and education.

5.2.6 Impact of illegal uses

5.2.6.1 Oregon Islands

Aerial disturbance to seabird and pinniped colonies on rocks, reefs, islands and headlands is of concern all along the Oregon coast. Disturbance events can be caused by a wide range of powered and non-powered aircraft. Seabirds and pinnipeds are highly vulnerable to aerial disturbance and large numbers of eggs and young can be destroyed during a single disturbance event. Although not allowed as a public use and considered trespass on the refuge, rock climbers, anglers, and sightseers illegally access certain rocks and islands which are easily accessible at low tides. It is likely that this type of trespass will increase over the next decade and a half as the Oregon coast's population increases. Individuals accessing the near shore by boat, swimming, or surfboards may be interested in approaching the rocks and islands to get good views of the refuge's wildlife. Legal activities occurring on land and in the air and waters surrounding Oregon Islands NWR which have the potential to impact nesting wildlife include surfing, tide pool exploration, beachcombing, recreational diving, commercial filming, commercial and sport fishing, and aircraft flying at low altitudes over the ocean.

The Coquille Point Unit has been negatively affected by graffiti, vandalism, waste dumping, and overnight camping. Illegal uses persist partly due to limited law enforcement capability and lack of public awareness of the sensitivity of the wildlife to human disturbance. Activities occurring on beaches surrounding Coquille Point and adjacent to the nearby coastal rocks and islands that can impact refuge wildlife include surfing, kayaking, fishing, bait collection, skimboarding, jogging, kite flying, driftwood fires, and uncontrolled dogs. These lands are managed by OPRD; therefore,

the Complex works cooperatively with OPRD to minimize the negative impacts from these uses on refuge resources.

5.2.6.2 Three Arch Rocks NWR

The wildlife using the Three Arch Rocks Refuge experience disturbance by boaters and pilots; seabirds and pinnipeds are highly vulnerable to disturbance, and large numbers of eggs and young can be lost during a single event. Thus, activities occurring in the waters within 500 feet of these islands have a high potential for disturbing wildlife. Disturbance by boaters has decreased since the 1994 ruling by the Oregon State Marine Board that established a 500-foot seasonal closure (Buffer Zone) of the waters surrounding the refuge to reduce breeding season impacts from disturbance events caused by boats.

5.2.6.3 Cape Meares NWR

Due to high public use and the almost daily presence of refuge and OPRD volunteers, illegal activity at Cape Meares is minimal. Off-site public use facilities, provided with Service funds, have been vandalized and stolen on only two occasions in the past 14 years. It is anticipated that an increase in law enforcement presence would further reduce the incidence of illegal activity.

5.3 Historic Properties and Cultural History

5.3.1 Oregon Coast human history

Prior to the arrival of Euro-Americans, Native American Tribes occupied many locations along the Oregon coast. It is estimated that Native Americans first came to the Oregon Coast 12,000 years ago to hunt, fish, and gather food in the coast's bountiful forests and waters. It was largely subsistence based living and the archaeological evidence left behind is limited due to the fact that 12,000 years ago the shoreline was 20 miles west of its current location thus inundating use sites of the time. Several researchers (Berreman 1944, Chase 1873, Ross 1977, Schumacher 1877a, 1877b) noted the association of offshore rocks with large mainland village sites in Oregon. Fish and wildlife populations on or associated with the rocks and islands were of great economic importance to Native American Indians. Some of the rocks and islands in Oregon were occupied by native people at least seasonally. Archaeological sampling of a large midden in 1989 found shellfish remains to be the most common items along with some pinniped, fish and seabird bones (Gard 1990, 1992). Cultural material found on several offshore rocks suggests that these rocks were occupied at least seasonally. At YHONA, archaeological investigations of midden sites on the mainland, revealed the presence of seabird bones including cormorants, gulls, albatross and loons.

The evidence from these midden sites indicates a healthy human population utilizing a myriad of natural resources. Perhaps as early as the 16th century the native populations began to decline precipitously. Largely from diseases that arrived with European explorers. By the late 19th century the remaining populations were forcibly relocated to centralized reservations (Gard 1990). Descendants of the original coastal inhabitants are found in the current major tribes of the Oregon coast, the Confederated Tribes of Grand Ronde; the Confederated Tribes of Siletz Indians; Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians; Coquille Indian Tribe and the Clatsop-Nehalem Confederated Tribes.

European exploration of the Oregon Coast began in the 18th century with Spanish explorers, and the British soon followed, both laying claim to the Northwest Coast. The American Robert Gray visited the Oregon Coast via the sea in 1788 and 1792 and came back with furs (Center for the Study of the Pacific Northwest 2008). After the Louisiana Purchase, Lewis and Clark reached the Oregon Coast in 1804 and staked the United States' claim to the territory. They returned east with furs, and this led John Jacob Astor to set up the first permanent white settlement in Oregon. The post, called Astoria, was at the mouth of the Columbia River.

Oregon achieved statehood in 1859, and the completion of railroads through the Coast Range Mountains encouraged land development along the ocean shore. In 1874, the Oregon State Land Board began selling public tidelands to private landowners. Resorts grew up around the beaches at Seaside, Newport, and Rockaway, and the newly completed railroads brought tourists from the population centers of the Willamette Valley for weekend vacations. In 1911, Governor Oswald West was elected on the promise to reclaim Oregon's beaches as public land (OPB 2008). The legislature favored the privatization of these lands, but West was able to make an argument for public ownership based on the need for transportation. The 1913 legislature declared the entire length of the ocean shore from Washington to California as a state highway. Legislators also created the State Highway Commission, which began the construction of Highway 101 (OPB 2008). The OPRD bought land for 36 state parks along the coastal highway, an average of one every 10 miles. With the completion of the highway and parks system, coastal tourism came of age (NOAA 1998).

5.3.1.1 Oregon Islands NWR

The offshore rocks and islands of the Oregon Islands NWR have known cultural resources of significance to Native American Tribes whose ancestors used the islands and harvested wildlife for thousands of years. The rocks and islands were also targeted by Euro-Americans as early as 1892. They exploited common murre colonies along the southern Oregon coast for food. An article in the Port Orford Tribune newspaper on May 17, 1892, states that Asa Carey and Charles Anderson, two local men, were starting a business to harvest murre eggs from rocks off of Humbug Mountain. The article also stated "The murre, which a few years ago was not known to exist north of Cape Mendocino are now to be found off Humbug by thousands." Apparently, murre colonies on Island Rock and Redfish Rocks west of Humbug Mountain were the targets of this harvest, with the eggs being sent to San Francisco by ship. Articles in the Port Orford Tribune on June 11, 1901 talk of simultaneous harvest of murre eggs on Island Rock and Blanco Reef (probably Orford Reef off Cape Blanco). Charles and Will Strahan were the owners of the company. This apparently did not end murre eggging in this area as The Port Orford Tribune reported on June 9, 1909, that the crew of the boat Ranger had gathered 170 dozen eggs in one forenoon's work. An article in the Centennial Edition of the Coos Bay Times on May 3, 1947, indicated that in the early days, an average of 700 dozen murre eggs was gathered each year at Island Rock and Redfish Rocks. It appears that by the turn of the century, thousands of murres nested on the rocks and islands near Port Orford and supported commercial harvesting of eggs for at least a decade (Manuwal et al. 2001). Both the Coquille Point and Crook Point units contain Native American cultural resources and sites of significance to the Coquille Indian Tribe and the Confederated Tribes of the Siletz Indians.

On July 7, 1992, a perpetual easement with Eternity at Sea was established for privately-owned Tillamook Rock. The easement states the rock is to be known as the Tillamook Rock Lighthouse Unit of the Oregon Islands National Wildlife Refuge and is to be managed as a seabird nesting

and habitat area in perpetuity and as a non-visiting columbarium/cemetery and historic lighthouse. The lighthouse is listed in the National Registry of Historic Places.

5.3.1.2 Three Arch Rocks NWR

There are no historic properties associated with the Three Arch Rocks Refuge. This refuge has the distinction of being the first National Wildlife Refuge established west of the Mississippi River. The need to designate the refuge as a protected wildlife area was brought to the attention of President Theodore Roosevelt by two pioneer naturalists and conservationists from Oregon, William L. Finley and Herman Bohlman. Finley and Bohlman visited the wind and sea-swept rocks in June of 1901 and 1903 to photograph the unique wildlife. To reach the rocks, they loaded up a dory with food, a tent, water, clothing and photographic equipment and rowed toward the rocks. Shag Rock, the westernmost large rock, was the only rock with a landing spot and the men unloaded their equipment. They camped on Shag Rock for two weeks during which time they took some of the first photographs of nesting seabirds, collected eggs and specimens for study, and documented some of the life history of the birds. During the first expedition they witnessed a tugboat filled with target shooters circling the rocks blasting seabirds for sport every Sunday. Throughout the week they further witnessed other boats carrying gunners who were shooting Steller sea lions for their skins and oil. They knew they had to put a stop to this slaughter as the seabird and sea lion colonies could not survive much longer. After the expedition, Finley traveled across the country to Washington, D.C. for a personal audience with the President. After four additional years of lobbying, the President designated Three Arch Rocks as the first National Wildlife Refuge west of the Mississippi River on October 14, 1907 (Sharp 1926).

5.3.1.3 Cape Meares NWR

There are no historic properties or known cultural resources associated with this refuge. Cape Meares Lighthouse is listed in the National Register of Historic Places; however, it is located on the adjacent State Scenic Viewpoint and is not included in the MOU for management of the refuge and state park.

5.3.2 Special designation areas

5.3.2.1 Oregon Islands NWR

Bird Rocks, Blanco Reef, Coquille Point Rocks, Goat Island, Mack Reef, Orford Reef, Redfish Rocks, Table Rocks, Two Arches Rock, Whaleshead Island, and the islands surrounding YHONA are all designated as Important Bird Areas (IBAs). A portion of the refuge rocks and islands were designated as a National Wilderness Area in 1970 and the remaining rocks and islands, except Tillamook Rock, were designated in 1978 and 1996. The wilderness is named Oregon Islands Wilderness. The Crook Point Unit is designated by the Oregon Natural Heritage Advisory Council and registered as a Natural Heritage Conservation Area by the State Land Board because of its significant species and natural resource values.

5.3.2.2 Three Arch Rocks NWR

The refuge is designated as an IBA. Oregon's Important Bird Area program recognizes sites of outstanding importance to birds in the state. Sites with IBA designation are extremely important to Oregon's birds, though the IBA program by itself does not ensure the continued productivity of

selected sites and certainly cannot guarantee continued avian diversity throughout the state. Most species of birds within IBAs are at least partially migratory, and most of the waterfowl, shorebirds and seabirds of Oregon's IBAs are highly migratory, or at least make extensive flights between the recognized IBAs and other areas. The refuge was designated as a National Wilderness Area on October 11, 1978, and is known as Three Arch Rocks Wilderness.

5.3.2.3 Cape Meares NWR

The refuge (except for the hiking trail) was designated a Research Natural Area (RNA) on June 11, 1987. Research Natural Areas are part of a nationwide network of ecological areas set aside for both research and education. Cape Meares refuge was designated a RNA to further protect its unique vegetation, geology, and wildlife habitat in a naturally functioning ecosystem. The goals and objectives for Cape Meares NWR as a RNA are: (1) to preserve an example of a significant natural ecosystem for comparison with those influenced by humans; (2) to provide an educational and research area for ecological and environmental studies; and (3) to preserve gene pools of typical and endangered plants and animals.

5.4 Social and Economic Conditions

The Oregon coast stretches 362 miles and includes seven counties: Clatsop, Tillamook, Lincoln, Lane, Douglas, Coos, and Curry. Measured from the crest of the Coast Range Mountains, the coastal area of Oregon encompasses 7,800 square miles. One in three acres along the Oregon coast is federally owned (1000 Friends 2008).

5.4.1 Population demographics

The Oregon coast is home to one in every 15 Oregonians or roughly 6.5% of the state's population (DLCD website). These 225,000 residents are scattered along the coast, with 60% living in the coast's 32 incorporated communities and 40% living in unincorporated communities or in rural parts of the seven counties. The five largest cities are Coos Bay, North Bend, Newport, Lincoln City, and Astoria. The Oregon coast gained 20,000 new residents in the 1990's (USCB 2000).

The coast's population is older than the state average, and includes many retirees. According to the 2000 Census, one-third of all coastal residents are over the age of 55, and the median age on the coast is 40, compared with the state's median age of 36. The coast is ethnically homogenous with 91% of coastal residents listed as Caucasian (USCB 2000).

5.4.2 Economy and employment

Over 100,000 people work on the coast, 80% of whom work for private businesses. Tourism is the leading employer on the entire coast employing 23,000 people. In 2002, tourism spending on the Oregon coast exceeded \$1.3 billion, an 80% increase over the previous 10 years. Spending by visitors generates sales in lodging, food services, recreation, transportation, and retail businesses. These sales support jobs for Oregon residents and contribute tax revenue to local and state governments.

The growth in tourism has partially offset a decline in the coastal timber and fishing industries. Yet the coast remains one of the largest producers of timber in Oregon and in 2002 the coast

accounted for more than a quarter of all timber production in the state. Agriculture is important in many parts of the Oregon coast. In 2001, gross farm sales on the Oregon coast totaled more than \$175 million. Dairy products brought in nearly \$95 million in sales during that same year. Tillamook County produces \$85 million in dairy products annually. Some regions produce specific agriculture products including farms in Curry County that account for 90 percent of the nation's Easter lily bulbs, and 35 million pounds of cranberries grown on acidic soils in and around Bandon (1000 Friends 2008).

Despite growth in some areas, the coast's economy lags behind the rest of the state. While statewide employment grew by 23% from 1990 to 2000, coastal jobs increased by only 13%. Unemployment has also been higher on the coast (Cowden 2003). From 1996 to 2001 the average unemployment rate on the coast was more than 7%, compared with 5.7% for the state. Using an index based on employment and income figures, the Oregon Economic and Community Development Department considers four coastal counties (Coos, Douglas, Lane—outside of Dunes City, and Lincoln) to be economically distressed, along with seven communities outside of the economically distressed coastal counties of Astoria, Brookings, Garibaldi, Gold Beach, Nehalem, Port Orford, and Tillamook (Oregon Economic Development Council 2008).

Income on the Oregon coast has also lagged behind other parts of Oregon, and poverty has been higher. Coastal per capita income is \$24,000 a year, 15% below the state average. And the 2000 Census found 13% of coastal residents live in poverty, compared with 10.6% statewide. Children First for Oregon reports nearly half of all children on the coast (46%) live in or near poverty levels, compared with 37% statewide (U.S. Bureau of Economic Analysis 2001).

5.4.3 Transportation

Highway 101 is a designated National Scenic Byway and All American Road that runs the length of the coast, acting both as a highway and a main street through many coastal communities. With a growth in population, traffic has become more congested on Highway 101 and the Oregon Department of Transportation data show the average daily flow of traffic increased by 10% from 1993 to 2003. The influence of seasonal tourism on Highway 101 is also evident, as traffic volumes in August are an average of 59% higher than traffic volumes in January (ODOT 2008).

5.4.4 The beach

In 1967, the Oregon Legislature passed the Beach Bill, which guaranteed public access to all Oregon beaches. Today, 90% of Oregon's beaches are accessible to the public via 1,150 beach access points, an average of three access points per mile of coastline (1000 Friends 2008).

5.4.5 Diversity

According to the 2005 OPRD SCORP in Oregon, as in the United States as a whole, minority populations are increasing at a rate well above total population growth. As a result, recreation providers in the state of Oregon must consider the needs of an ethnically mixed population when planning for outdoor recreation opportunities. Resource management agencies under the Department of the Interior and the Department of Agriculture including the U.S. Forest Service, the Bureau of Land Management, and the National Park Service are responding to some demographic changes by initiating recreation research to learn more about ethnic recreation

behavior. For example, studies have established that African Americans are less likely than European Americans to pursue recreation in dispersed settings or to travel to regional recreation areas. Also, Hispanic visitors tend to be more family and group-oriented when visiting outdoor recreation areas. The Service will be consulting this growing literature base to assist in satisfying the recreation needs of an increasingly diverse population.

5.5 Environmental Consequences

The purpose of this section is to describe the social and economic effects, and the significance of the anticipated effects associated with implementing various management actions as related to public use prescribed under the alternatives described in chapter 2. The alternatives are compared “side by side” under each topic, to facilitate comparison. Both adverse and beneficial effects of implementing each alternative are described.

Table 5.5 provides an overview of the anticipated social and economic effects on public use activities under the two alternatives by indicator. Effects are described in terms of the change from current conditions. Alternative 1, the no-action or current management alternative has a neutral effect because no changes to management programs would occur under this alternative. The analysis shows that implementation of Alternative 2 is not expected to result in a significant effect to the human environment, however, some positive and some negative effects are expected. The terms intermediate, minor, and slight, are used to describe the magnitude of the effect. To interpret these terms, “intermediate” is a higher magnitude than “minor,” which is a higher magnitude than “slight.” The word “neutral” is used to describe a negligible or unnoticeable effect compared to the current situation.

Adverse effects to opportunities for recreational public uses would be considered significant if a proposed action resulted in a substantial displacement of a wildlife-dependent public use or a substantial reduction in the quality of the wildlife-dependent experience. “Significant displacement” in this document is defined as termination of the activity at one of the Service’s offsite visitor facilities, either lost altogether or moved to a geographically distant area, or termination of the activity altogether as associated with the Complex’s refuges. A “substantial reduction in the quality” will be defined as an increase in visitation to greater than a level supported by the existing facility, or manageable with existing resources, or substantial anticipated losses of wildlife or habitat supporting the experience.

Positive effects to opportunities for recreational public uses would be considered significant if a proposed action resulted in substantial increase in opportunity for or quality of a wildlife-dependent public use. A “substantial increase in opportunity” will be defined as the opening of an existing facility to a new wildlife-dependent public use, the creation of a major offsite viewing facility where no comparable facility currently exists within a reasonable driving distance, or the improvement in the quality of an existing facility including parking, interpretation opportunities, and other public amenities, such that the facility condition moves from primitive to fully developed and managed.

Table 5.5 Summary of social and economic effects on public use of ccp alternatives

Social Effects	Alternative 1 Current Management	Alternative 2 Enhance Wildlife and Habitat, Maintain Public Use
Overall Visitation (on/off-refuge land)	Neutral Effect	Intermediate positive effect
Opportunities for Quality Wildlife Observation	Neutral Effect	Minor positive effect
Opportunities for Quality Wildlife Photography	Neutral Effect	Minor positive effect
Opportunities for Quality Environmental Education	Slightly Negative Effect	Intermediate positive effect
Opportunities for Quality Interpretation	Neutral Effect	Intermediate positive effect
Effects to Cultural and Historic Resources	Neutral effect	Slight positive effect
Amount of Illegal Use	Neutral effect	Intermediate positive effect
Economic Effects	Neutral Effect	Minor positive effect

5.5.1 Projected user numbers and outdoor recreation demands in 2015

As an overview to assessing the social and economic effects of Alternatives 1 and 2, it is important to understand the broader context of the refuges within the region and how recreational demand and public use is expected to change over time. A growing visitor presence on the refuges can be expected in the future. Many of the public use opportunities currently provided at the refuges are very popular within the state, and are forecasted to attract increasing amounts of participants in the coming years. A 2008 report by OPRD (2008) estimates the percent of change in the number of people participating in recreational activities in the future compared to current levels. According to the study, visitors aged 40 and older reported they are likely to expect an increase rather than a decrease in their outdoor recreation activities. On average across all activities, visitors 40 years of age and older, expect to spend 28% more days recreating by 2015 than they currently do. The top five activities that visitors participated in the most in a year, included walking, bird watching, jogging, sightseeing and bicycling.

In the age group of 5-18 years old there has been a steady decline in the amount of time children spend outdoors and an increase in the amount of time spent indoors. This disconnect from nature is projected to have serious long term implications for the health and well-being of the state's population and to the future stewardship of our public lands. Research has shown that people who do not participate in outdoor recreation as youth are less likely to participate in those activities as adults. Exposing children to outdoor recreation activities can provide children a variety of benefits including physical, social, emotional and spiritual benefits (OPRD 2008). The Service has launched a nationwide initiative "Connecting Children with Nature" to encourage refuges to implement strategies that serve to increase the amount of time children spend outdoors, especially on our refuges. Thus, the Oregon coast refuges anticipate an increase in the amount of students participating in environmental education.

The 2006, Banking on Nature report (Caudill 2006) focused on the employment, income, and tax revenue effects that recreational visitors to national wildlife refuges have on the economies of local regions. Additionally, it measured the impact of "ecotourism" which was defined as large numbers of people traveling substantial distances to take part in non-consumptive uses of the natural environment. Ecotourism is on the rise around the world and it is one method that can be used to derive economic benefits to a community from the conservation of wildlife and habitat. In 2006,

34.8 million people visited a National Wildlife Refuge in the lower 48 states for recreational purposes. Their spending placed nearly \$1.7 billion into regional economies from sales. These sales helped employ approximately 27,000 people. Approximately 82% of total expenditures are generated by non-consumptive activities on refuges nationwide. The Refuge Complex hosted over 1,000,000 visitors in 2007. More than 97% participated in nonconsumptive uses on the refuges and the remaining 3% participated in hunting and fishing (RAPP 2007).

It is important to consider the amount of population growth forecast for the Oregon coast between now and 2015. Population growth is expected to increase in all Oregon coast counties except Clatsop and Coos (USCB 2000). Regardless of which alternative is selected, population growth and increasing recreational demand, particularly in nature activities, is expected to increase the demand for outdoor recreation on the refuges.

5.5.2 Opportunities for quality wildlife observation and photography

No significant adverse effects are expected under either of the alternatives, because none of the alternatives would displace any wildlife observation or photography activities. Visitation is expected to increase under both alternatives, mostly due to population increases and the growing popularity of wildlife observation. None of the alternatives are expected to result in increasing crowding by more than half of the current use or in substantial anticipated losses of wildlife or habitat supporting the wildlife viewing or photography experience.

5.5.2.1 Alternative 1

Only facility maintenance would occur under this alternative. Effects on opportunities for wildlife observation and photography would be neutral or slightly negative, because growth in population and recreational demand means that more visitors would arrive at the refuges, but the number of facilities available to accommodate the visitors under these alternatives would remain the same. Currently, wildlife photography and observation opportunities available to the public primarily occur on off-refuge sites owned and managed by city, county, state and federal agencies. To facilitate this off-site public use, the Refuge Complex has enhanced wildlife viewing opportunities on several mainland areas that overlook refuge rocks and islands at sites managed by these agencies. For example, the Complex used a variety of funding sources and worked with partners to upgrade and repave the parking lot and sidewalk and to construct wildlife viewing decks with accompanying interpretive panels at Shore Acres State Park's Simpson Reef Overlook. Under this alternative, the Complex will continue to work cooperatively to maintain these facilities but will not upgrade or add any new facilities to improve opportunities for wildlife observation and photography.

5.5.2.2 Alternative 2

Facilities to improve opportunities for wildlife observation and wildlife photography would be upgraded and enhanced under this alternative, resulting in a minor positive effect for wildlife observation opportunities and a slightly positive effect for photography. Habitat improvements including the removal of invasive species under Alternative 2, would make it reasonable to assume that these improvements would create a minor increase in wildlife viewing and photography opportunities for some species. As stated above under Alternative 1, most wildlife photography and observation opportunities available to the public occur at off-refuge sites owned and managed by city, county, state and federal agencies. Under this alternative, the Complex will continue to

work cooperatively to maintain these facilities and will look to upgrade and/or add new facilities to improve opportunities for wildlife observation and photography. It benefits the Complex's natural resources to continue to work with partners like OPRD and BLM, because as they improve or maintain visitor facilities, it provides an opportunity to get the wildlife conservation message delivered to more visitors in a manner that minimizes disturbance to wildlife. Under this alternative we will also look to establish partnerships with the Oregon Coast Aquarium and Sea Lion Caves to develop interpretive panels on their lands or within their visitor facilities. Each partnership between the Complex and another private or public group will be formalized in a MOU to ensure the goals and objectives of both the cooperator and the Complex are delineated and that the roles and responsibilities of each agency or group are clear.

5.5.3 Opportunities for quality environmental education

No significant adverse effects are expected under either of the alternatives, because neither would displace any environmental education activities. Neither of the alternatives would result in substantial anticipated losses of wildlife or habitat supporting the environmental education experience.

5.5.3.1 Alternative 1

With limited staff time available, the only way the Complex can currently offer a high quality environmental education program coast-wide is by annually hiring temporary staff through national service programs like Northwest Service Academy's AmeriCorps. Under the No Action Alternative, the Complex would continue to coordinate and cooperate with school districts and the Northwest Service Academy to annually hire at least one AmeriCorps member to provide environmental education if funding allows. The uncertainty associated with availability of annual funding to hire temporary environmental education staff results in a slightly negative effect to opportunities for environmental education under this alternative, since in any given year the environmental education program could be suspended if funding is unavailable.

5.5.3.2 Alternative 2

Under this alternative, either an Environmental Educator (GS-7/9) or temporary staff would be hired to expand the environmental education program for the Complex, resulting in an intermediate positive effect. Specifically, under this alternative, the Complex would develop a quality environmental education program focusing on seabirds and other wildlife of Oregon Islands and Three Arch Rocks NWRs. The Complex would pursue partnerships to develop, fund, and implement a seabird education module for coastal schools. The Complex would develop an MOU with school districts to implement environmental education along the Oregon coast, including strategies to secure long-term funding for bus transportation to support school participation in environmental education programs. Expansion of environmental education opportunities in cooperation with OPRD would also take place offsite under this Alternative. Specifically, the Complex would work with OPRD and Friends of Cape Meares to develop and implement an environmental education program and an evening campground program at Cape Lookout State Park. The Complex would seek grant opportunities to cover program expenses.

The positive effects under Alternative 2 would not be considered significant because the proposed actions will not create a new environmental education program where none existed before, nor will they open the refuges to a new wildlife-dependent public use.

5.5.4 Opportunities for quality interpretation

Both alternatives provide existing opportunities for visitors to encounter interpretive signs, refuge brochures and publications, and refuge interpretive volunteers. No significant adverse effects are expected under any of the alternatives, because neither of the alternatives would displace existing interpretive activities. None of the alternatives would result in substantial anticipated losses of wildlife or habitat supporting the interpretation experience.

Under Alternative 2, the positive effects to opportunities for quality interpretation resulting from an increase in interpretive signage and expanded coverage by refuge interpretive volunteers would not be considered significant because the proposed actions will not open an existing facility to a new wildlife-dependent public use nor create a major offsite interpretive opportunity where no comparable opportunity currently exists within a reasonable driving distance.

5.5.4.1 Alternative 1

The Complex currently partners with OPRD and BLM to provide quality wildlife viewing opportunities at sites they own and manage. Under this alternative the Complex will continue to station interpretive volunteers on these lands where public visitation is high and wildlife can be easily viewed. The Complex will work to ensure that as part of this partnership the cooperating agencies continue to provide the volunteers with a full hook-up site for a Recreational Vehicle at a nearby state park campground and in return the Complex will recruit, train and provide viewing equipment and uniforms for the volunteers. However, no additional coastal sites overlooking refuge lands will be added to the interpretive program (i.e., adding volunteers on these sites) under this alternative nor will any additional interpretive facilities (i.e., viewing decks, interpretive panels, brochures) be added.

5.5.4.2 Alternative 2

As part of Alternative 2, the preferred alternative, the Complex would maintain and grow existing partnerships and establish new partnerships to develop public use facilities that enhance interpretation, resulting in an intermediate positive effect. As mentioned above, the Complex designed and installed interpretive and regulatory panels at offsite locations with the dual purpose of explaining the natural history of the wildlife living on the rocks and islands and communicating to visitors the regulations protecting these species. Under the Preferred Alternative, the Complex would maintain all existing interpretive panels and would develop new interpretive panels to be placed at additional public access sites along the coast. Under this alternative, each partnership between the Complex and another public agency, including OPRD and BLM, would be formalized in a MOU to ensure the goals and objectives of both the cooperator and the Complex are delineated and that the roles and responsibilities of each agency or partner are clear.

Due to an increase in the number of visitors to the Oregon coast, there is a need to expand the Complex's wildlife interpretation program, by stationing volunteer interpreters seven days per week from April through September, and adding volunteer locations. Under this alternative the volunteer wildlife interpretation program would be expanded to include new sites that have been identified as high priority for interpretation. As the Refuge Complex volunteer program grows, more work would be placed on an already limited staff. Therefore, hiring a full-time GS 7/9 volunteer coordinator would be pursued. The coordinator would manage a program that annually

utilizes volunteers to control invasive species, maintain public use facilities, lead environmental education field trips, and conduct wildlife interpretation, as well as assist with biological tasks.

5.5.5 Effects to cultural and historic resources

The National Historic Preservation Act (NHPA) of 1966, as amended, establishes the Federal Government's policy on historic preservation and the programs through which that policy is implemented. An impact to cultural resources would be considered significant if it adversely affects a resource listed in or eligible for listing in the National Register of Historic Places (NRHP). In general, an adverse effect may occur if a cultural resource would be physically damaged or altered, isolated from the context considered significant, or affected by project elements that would be out of character with the significant property or its setting. Title 36 CFR Part 800 defines effects and adverse effects on historic resources. To avoid adverse effects to cultural resources a cultural resource survey would be conducted prior to implementing any restoration activities. Any new cultural resources identified during the survey would be recorded and evaluated for eligibility to the NRHP. If any sites are determined to be eligible to the NRHP, the restoration plans would be assessed for potential effects to the historic property. If effects are possible, the proposal would be reviewed to ensure that the effects have the least impact to original materials and are in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Changes that comply with the Secretary's Standards would have no adverse affect on historic properties. Once an assessment has been completed, the findings would be forwarded to the State Historic Preservation Officer (SHPO) for concurrence.

5.5.5.1 Alternative 1

There would be a neutral effect on refuge cultural resources under this alternative. Native American Tribes and federal agencies would continue to be essential partners under Alternative 1. Complex staff members would continue to go through the process listed above and coordinate with Native American Tribes when conducting ground-disturbing activities, particularly in the preplanning stage for projects involving significant ground disturbing activities.

5.5.5.2 Alternative 2

There would be no significant impacts to cultural resources as a result of human activity within the refuges under this alternative. The changes in public use and to wildlife habitat that would occur under this alternative would not alter the protection of any known sites and would not diminish the historic character of these sites. Under this alternative, the Complex would continue to work with Native American Tribes to locate, characterize and protect cultural resource sites on refuge lands and maintain secrecy and security of sites. In addition, the Complex would seek the Tribes' assistance to identify and characterize significant archaeological sites and plan for their protection in accordance with provisions of the Archaeological Resource Protection Act of 1979. A refuge GIS layer would be developed for archaeological sites, burial sites and sacred areas, and would contain "constraint for use" conditions to protect sensitive information. In accordance with the Native American Graves Protection and Repatriation Act of 1990, Refuge Complex protocol and procedures would be established for handling inadvertent discoveries of human remains, burial objects, sacred objects, and objects of cultural patrimony.

5.5.6 Amount of illegal use

Human disturbance (via aircraft, boat or foot trespass) to seabird colonies and pinniped rookeries; vandalism; and garbage dumping occurs on the Refuges. Both alternatives include measures to deter illegal uses of the refuge, however, Alternative 2 provides more aggressive measures to curb illegal activities and create a safe environment for visitors. Under this alternative, a primary focus for the Complex's full-time permanent law enforcement officer would be to establish cooperative arrangements with other local, state and federal enforcement agencies to enforce refuge and wildlife regulations and laws, and eliminate illegal trespass on closed areas of refuge. The officer would also work to establish partnerships with state and local agencies to ensure the accuracy of refuge and wildlife regulations in their publications. The actions would result in intermediate positive effects to opportunities for recreational public uses, but they would not be significant because they would likely not result in a substantial increase in the opportunity for quality of any wildlife-dependent public uses. The actions would also result in intermediate positive benefits to natural resources due to the reduction in trespass and refuse dumping.

5.5.7 Economic effects

In 2007, visitors spent more than \$1.37 billion in travel related expenses on the Oregon coast (Runyan 2007). These visitors stated sightseeing and wildlife watching as two of the five primary reasons for their visit to the Oregon coast (OPRD 2003). Oregon Islands, Three Arch Rocks, and Cape Meares NWRs provide these two opportunities to visitors and thus have an impact on the economies of the Oregon coast. Furthermore, the Complex receives an annual budget that supports employee salaries, the refuges' operations and maintenance costs, and wildlife habitat and public use programs for all six refuges within the Complex. The Complex is sometimes allocated funding for capital improvements such as improving roads and parking lots, construction of viewing decks, boardwalks, and kiosks. All of these activities require spending by the Service, which results in effects on the local economy.

The Refuges also provide an indirect economic impact to the coastal economy through the many recreational activities that they support. These activities currently include wildlife observation, photography, environmental education, and interpretation. These activities will continue under both alternatives, thus, the visitors that participate in these activities will contribute to the health of the coastal economy through the purchase of goods and services (e.g., food, lodging, fuel, equipment).

Refuge Complex recreational programs and facilities would vary by alternative with more programs and facilities being developed under Alternative 2. The addition is mostly due to projected increases in interpretation and environmental education programs. Overall, recreational visitation is expected to be slightly higher under Alternative 2 than under Alternative 1 because of the greater emphasis in this alternative for an expanded number of interpretive and environmental education programs. As a result, Alternative 2 would result in the highest number of local jobs and have the highest degree of local economic effect stemming from the recreational expenditures of refuge visitors.

The economic contributions resulting from the recreational opportunities offered by the Oregon coast refuges are very small within the context of the overall tourist/recreation economic picture along Oregon's coast. Refuge Complex operational expenditures would vary by alternative based

on staffing levels and programs associated with each alternative, and each alternative would result in a different degree of economic effect. Alternative 2 requires the highest level of staffing and expenditure and would have a greater effect on the local economy as compared to the no action alternative. However, effects to the local economy under either alternative are not considered significant since the gain or loss in total personal income stemming from expenditures associated with the refuges do not constitute a significant portion of the total recreational incomes of the counties in the economic influence area.

5.5.8 Cumulative effects

The term “cumulative effects” is defined in the Council of Environmental Quality’s (CEQ) regulations in 40 CFR Part 1508.7, as: “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.” Direct and indirect effects are addressed in the resource-specific sections of chapters 3, 4, and 5. It should be noted that since direct and indirect effects associated with implementing the various alternatives have been evaluated in a comprehensive manner, the cumulative effects analysis is largely complete. The analyses in the following section primarily focuses on effects associated with reasonably foreseeable future events and/or actions regardless of what entity undertakes that action.

As described in Chapters 3, 4, and 5, cumulatively, there has been very little change to the rocks, reefs, and islands along the Oregon coast. However, there has been substantial modification to all native mainland habitats including headland forests and coastal prairie, two habitats which exist in limited acreage within these refuges. A variety of government agencies including OPRD, BLM, USFS, and the Service have protected a large number of natural areas along the coast, however, modification and loss of native habitats and human pressure on protected areas continues at a regional scale due to a growing coastal population and the increase in coastal tourism. Loss of old-growth forest structure and the introduction of invasive species into habitat have altered ecosystem processes along the coast, and global climate change and associated changes to the marine environment will have additional impacts on coastal habitats.

As protected areas, Oregon Islands, Three Arch Rocks, and Cape Meares NWRs, though relatively small in size, are extremely important to the persistence of coastal wildlife. Under both alternatives, the Complex would protect and maintain its coastal habitats and their associated wildlife and plant species. Invasive species are likely to become more prevalent on surrounding lands, but on the Refuges, active efforts would be made to reduce their populations, especially under the Preferred Alternative. Under alternative 2 the Complex would emphasize working closely with partners to research, design, and implement cooperative studies that would directly contribute toward understanding and maintaining or restoring the biological integrity, diversity, and environmental health of the refuges. The Complex would improve the availability and quality of wildlife-dependent recreation under both alternatives, but would expand public use programs under Alternative 2. Under both alternatives, the Complex would continue to promote and preserve the wilderness characteristics of Oregon Islands and Three Arch Rocks Wilderness areas, though under Alternative 2, there would be a greater emphasis placed on reducing the effects of human disturbance to wildlife, and increasing awareness of the refuges and appreciation for natural resources of the area through partnerships. Because it is anticipated that human population growth along the Oregon Coast will result in continuing loss and degradation of wildlife

habitats and open space, refuge habitats, in concert with other protected lands will become increasingly important in their role of conserving resident and migratory wildlife species over the life of the CCP and providing places where the public can enjoy and appreciate nature. Implementing the CCP would have overall beneficial effects to habitats and species, but in the context of all of the factors (both natural and human-caused) which adversely affect habitats and species (e.g., food availability, marine currents, marine debris, human disturbance, ocean pollution, etc.) the positive contributions associated with CCP implementation do not represent a significant beneficial effect.

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