

Chapter 5. Social and Economic Environment



Priority wildlife-dependent uses of units of the National Wildlife Refuge System include hunting, fishing, wildlife observation and photography, and environmental education and interpretation.
Photos: USFWS

Chapter 5. Social and Economic Environment

5.1 Refuge Conditions, Infrastructure and Administrative Facilities

5.1.1 Introduction

The majority of the public recreation in the local area centers on the Columbia River. Water related recreational opportunities including power boating, sailing, kayaking, canoeing, waterfowl hunting, fishing, and camping provide the majority of the outdoor pursuits for the local and visiting public. Outdoor activities significantly increase during the summer season; however, many recreational activities such as fishing, boating and kayaking are not restricted to a specific season.

Designated camping facilities are limited in the local area. Vista Park, a county park just northwest of the Julia Butler Hansen Refuge, provides the area's only multi-use camping opportunities with approximately 47 camping sites—many with electrical and water hookups. Five newly established yurts help extend the camping season into the fall and winter for individuals without recreational vehicles (RVs) or other types of camp trailers. The park also provides a large sandy beach and a boat launch site and allows day use picnicking along the Columbia River. Two other camping areas nearby cater mainly to trailer and RV users.

Boat launch sites near the Julia Butler Hansen Refuge are available at the Elochoman Marina in Cathlamet, adjacent to Highway 4 between Cathlamet and Skamokawa, and next to Vista Park in Skamokawa. Near the eastern end of the refuge the Willow Grove Boat Launch is located just up river from the eastern tip of Crims Island. Two boat launch sites are located in the vicinity of the Lewis and Clark Refuge in Oregon. At the upstream end of the refuge, the Aldrich Point boat ramp is located at the east end of Brownsmead just down river from Tenasillahe Island, and the John Day Boat Ramp is located at the northwest end of the refuge by Karlson Island.

World-class sport and commercial fishing are some of the major attractions in the local area. Favorites among the anglers are spring and fall Chinook salmon, summer Coho salmon, and sturgeon. During good spring Chinook runs, boats may be seen packed into many areas in the lower Columbia. While the majority of fishing activities take place using watercraft, shoreline fishing is also fairly common. Winter steelhead fishing on the Elochoman River and other tributaries that flow into the Columbia River, is another common outdoor recreational pursuit.

Hunting of local game generally occurs in the fall and winter. Elk and black-tail deer hunting is a popular fall activity with plenty of private lands but limited public areas available to local hunters. Waterfowl hunting for ducks and geese is another popular fall and early winter activity with both refuges providing the lion's share of the waterfowl hunt opportunities and acreage.

5.1.2 Lewis and Clark Refuge Infrastructure and Administrative Facilities

5.1.2.1 Emerald Heights Unit

A large apartment complex lies just to the west of this 80-acre forested unit. The Emerald Heights Unit has no existing roads within it. The ground has many small drainages running through it and averages a 25 percent slope. In December 2007 an intense wind storm toppled numerous trees damaging this mature forest extensively.

5.1.2.2 Tongue Point Unit

The south side of Tongue Point Unit is bordered by a Coast Guard Station and a Job Corps Center with numerous buildings, including residences, and several piers. Tongue Point Unit has many old roads running through it that were once used to access the many former military munitions bunkers throughout the area. The cement bunkers are now empty but remain onsite. The main gravel road around the perimeter is navigable and not overgrown like the roads on the hill above it. Access to the main perimeter road is through a chain-link fence gate which is located at the boundary intersection with the Coast Guard Station. A second access point is located at the boundary intersection with the Job Corps Center. Tongue Point is the historic site of a machine gun range, Coast Guard buoy maintenance area and navy fuel depot. Contaminants including sand grit contaminated with lead and ammunition lead have been found on the site. The sand grit lead was removed by contaminants contractor in 2004 while the fuel depot site and machine gunnery range is being investigated under a contract with the Corps. There are a total of 70 acres on this unit. In December 2007 an intense wind storm caused numerous trees and boulders to crash down onto the main gravel road.

5.1.2.3 Brownsmead Unit

The Brownsmead-Knapa Fire District building and an old dilapidated barn are located on the 45-acre Brownsmead Unit. The fire district building and use of the administrative area of this site is covered under a Memorandum of Understanding (MOU).

5.1.2.4 Islands Unit

There are 32 privately owned hunting shacks, used primarily during waterfowl season within the acquisition boundary of the Lewis and Clark Refuge's Islands Unit. Thirty of these buildings are located on the water, on floats, 20-30 feet away from adjacent islands. Because they reside on tidelands owned by the State of Oregon, the duck hunting shacks are individually licensed and permitted by the ODSL. However since they are located within the designated acquisition boundary of the refuge, a Memorandum of Understanding (MOU) has been developed between the ODSL, Clatsop County, the Service, and hunt shack owners, setting stipulations to protect the conservation values of the refuge and surrounding waters.



Photo: Woody Island Floathouses adjacent to Lewis and Clark Refuge /USFWS

5.1.3 Julia Butler Hansen Refuge Infrastructure and Administrative Facilities

5.1.3.1 Mainland Unit

Refuge structures on the Mainland Unit include the refuge office, garage and parking lot, two residences, and a maintenance facility (shop building, pole barn and shop yard) all located off of Steamboat Slough Road in the northeast corner of the Mainland Unit. A wildlife viewing site with a parking lot and kiosks is located along Highway 4 approximately a quarter mile south of Brooks Slough Road. At the northwest end of the unit, there is a private residence and a commercial flower greenhouse that are separated from the refuge by Steamboat Slough Road. Also at the northwest end, a 100-yard wide strip of privately owned Sitka spruce swamp forest and Brooks Slough Road separate the refuge from two residences and commercial buildings in the town of Skamokawa. The refuge owns and manages an expulsion pump (60 horsepower) located adjacent to the Brooks Slough tidegate. Fourteen water control structures are located throughout the unit and are used to manage wetland water levels. Over 25 individual culverts, plastic and aluminum, channel slough and ditch water under refuge roads and crossings.

Six tidegates are located under the refuge perimeter dike (under Steamboat Slough and Brooks Slough Roads) to allow water to drain from inside the diked portion of the unit. The 48-inch diameter Duck Lake Slough tidegate drains water from the eastern portion of the unit, and at the head of Brooks Slough, a combined 3-tidegate structure drains water from the northwestern portion of the refuge. The expulsion pump located at the head of Brooks Slough also helps to drain excess water off of the refuge and is especially beneficial during periods of high river

levels when the tidegates do not open. Two additional smaller tidegates, one located at the west end of Steamboat Slough Road and one located at the west end of Brooks Slough Road also help to drain the northwest end of the refuge. The smaller northwest Steamboat Slough tidegate was replaced in 2003 to improve fish accessibility in that portion of the refuge. The smaller tidegate at the west end of Brooks Slough is extremely old (circa 1920), has a significant leak and is in need of replacement.

The Mainland Unit is located within Wahkiakum County Diking District #4 which has an easement for the refuge dike, and is responsible for maintenance of the refuge tidegates. Because the district has limited resources, the refuge has commonly either cost shared or provided sole funding for more recent tidegate and expulsion pump repairs and replacements. Both Steamboat Slough and Brooks Slough Roads are county roads and are managed and maintained by the county.

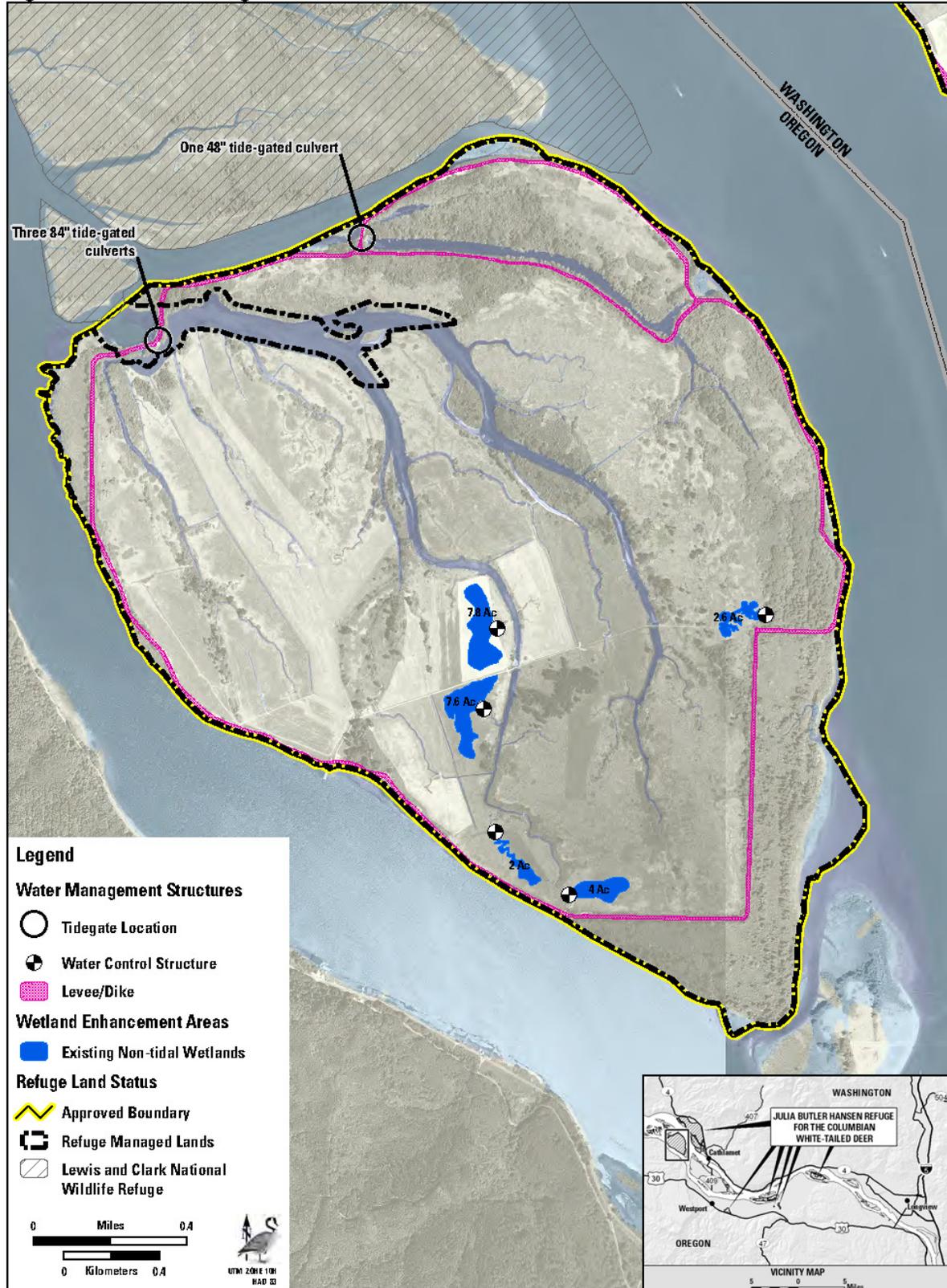
A 3.5-mile, 10-foot high fence is located along the refuge boundary from the refuge headquarters along Steamboat Slough Road to the far end of field 4 along Brooks Slough Road. The fence serves as a deterrent for elk entering the Mainland Unit from the forested lands north and west of the refuge. However, a determined elk can still enter the unit by moving past either end of the fence line. Additional standard pasture fences are located in many of the grazed pastures to keep cattle away from riparian sites, wetlands and forested locations.

5.1.3.2 Tenasillahe Island Unit

Refuge facilities located on this unit include a dock and barge loading facility which serves as the equipment/supply access point situated along the south side of the island in the Clifton channel. A maintenance area which includes a metal sided shop building and pole shed with wood framing is located approximately 300 yards inside the dike away from the docking facility. A floating hunting shack is also located in Multnomah Slough adjacent to the old dock site. This structure is covered under the same Memorandum of Understanding (MOU) which covers all of the duck shacks in the Lewis and Clark Refuge. Technically the shack is outside the boundaries of both refuges but since it is directly adjacent to Tenasillahe Island and close to the Lewis and Clark Refuge boundary, it is covered by the MOU. The MOU is an agreement signed between the ODSL and the Service and the individual floathouse owners.

In the 1920's a series of dikes, which remain today, were constructed on Tenasillahe Island for farming/grazing purposes. The dikes were constructed to provide protection to pastures from the rising waters of the Columbia River. The 6-mile dike which surrounds the exterior edge of this island continues to protect valuable CWT deer habitat from flooding. Adjacent to this dike is an interior one mile dike that provides additional flood protection for the interior of the unit. The Service is responsible for maintaining the dikes on the island and providing quality habitat for the recovery of the CWT deer.

Figure 5.1. Water Management Structures- Tenasillahe Island



Data Sources: Refuge Boundaries from USFWS/R1; Roads from ESRI; County and State Boundaries from BLM; Hydrology from NOAA and USGS; Imagery from 2006 NAIP

The back sides of maps are left blank to improve readability.

There are a total of four tidegates on the Island which allow water from the river to flow in and out of the sloughs, providing tidal inundation as naturally as possible to the interior sloughs. A set of three 84-inch tidegate structures are located on the main outflow channel of the island providing controlled movement of tidal waters in and out of the unit. These gates are made of aluminum and are side mounted to allow for improved fish passage. Each gate has a small fish door (photo on following page) which can be manually adjusted to allow water inflow and provide improved fish passage. The fish doors are open during the late spring through early fall seasons when the chances of flooding are reduced. A fourth 48-inch tidegate is located at the head of Multnomah Slough and allows water to drain from the northern portions of the island. To access various areas on the nearly 2,000-acre island unit there are gravel roads which run along the top of the Multnomah Slough Dike, perimeter dike, and through the center portion of the refuge. The refuge staff maintains each of the 4 tide gate structures, both dikes, and the gravel roads.

Water control structures are positioned at the 5 wetland sites on the unit and are used to manage optimum water levels in those areas. Two new bridges are located on the center road at the large slough crossing. These bridges were installed in 2007, to replace culverts, and to improve connectivity of fish movements in the sloughs. Several other locations along Center Road and Multnomah Dike Road have small culverts which channel water into roadside ditches and sloughs. The Tenasillahe Island Unit's main purpose is to provide quality habitat for the CWT deer.

5.1.3.3 Anunde Island Unit

At the north end of Anunde Island, adjacent to the refuge, there is a private residence and a large building that serves as a commercial fishing station and net drying facility.

5.1.3.4 Westport Unit

There are no structures in the vicinity of the Westport Unit. Railroad tracks belonging to the Portland and Western Railroad run along the outside boundary of the unit adjacent to highway 30.

5.1.3.5 Wallace Island Unit

The Wallace Island Unit has been logged in the past and the second growth forest which is approximately 70 years old, is now well established. Old roads are barely distinguishable and the former hog pen is now dilapidated on the east side of the island.

5.1.3.6 Hunting Islands Unit

There are no structures or facilities on the Hunting Islands. The Service signed a 50-year agreement with the U.S. Coast Guard to allow vegetation removal for maintaining the line-of-site to a channel marker for navigation purposes on the Columbia River.



Photo of new Tenasillahe Island Tidegate with fish door closed / USFWS

5.2 Public Use

5.2.1 Area Outdoor Recreational Opportunities and Trends

A State agency known as the Interagency Committee for Outdoor Recreation (IAC) advises the State of Washington on matters of outdoor recreation. The IAC conducts inventory of outdoor recreation sites and opportunities, conducts studies of recreational participation and preferences, and periodically releases documents related to overall State Comprehensive Outdoor Recreation Planning (SCORP).

5.2.1.1 Current Outdoor Participation Rates

The most recently released SCORP Assessment (IAC 2002a) identified 14 major categories of outdoor recreation, subdivided into 170 activities. Of these 14 major categories, walking/hiking and nature activities figure as the two most popular, with 53 percent and 43 percent of Washington state residents participating in these activities, respectively. The IAC also indicated that observing/photographing nature and wildlife have participation rates of 42 percent, and visiting interpretation centers has a participation rate of 7.5 percent.

5.2.1.2 Forecast of Future Regional Recreation Demand and Key Recreation Needs Identified by IAC

Overall, outdoor recreation activity in most activities continues to increase at high growth rates. In a recent technical report (IAC 2002b), IAC projected future participation in 13 of 14 major outdoor recreation use categories over periods of 10 and 20 years. Nine of these activities will experience double digit growth (see Table 5.1).

The most recent estimates of recreation trends were based on the National Survey on Recreation and the Environment, projections for the Pacific Region (NSRE), which includes Washington State. The IAC adjusted the NRSE projections as necessary based on age group participation, estimates of resource and facility availability, user group organization and representation, land use and land designations, and “other factors” including the economy and social factors. Table 5.1 shows the percent of change expected for Washington State by activity as reported by IAC.

The 1995 assessment identified trails and environmental education as the two highest outdoor recreation needs in the state. Many outdoor activities generally permitted on refuges are expected to show increases of 20 percent to 40 percent over the next 20 years. The exception is hunting, in which participation is expected to fall at about that same rate.

Table 5-1 Projected Future Increase in Participation for Selected Outdoor Recreation Activities

Activity	Estimated Change, 10 years (2002-2012)	Estimated Change, 20 Years (2002-2022)
Walking	23%	34%
Hiking	10%	20%
Nature Activities (includes outdoor photography, observing wildlife and fish, gathering and collecting, gardening, and visiting nature interpretive centers)	23%	37%
Fishing	-5%	-10%
Hunting/Shooting	-15%	-21%
Sightseeing (includes driving for pleasure)	10%	20%
Camping – developed (RV)	10%	20%
Canoeing/kayaking	21%	30%
Motor Boating	10%	No Estimate
Equestrian	5%	8%
Non-pool swimming	19%	29%

5.2.2 Overview of the Refuges' Public Use

The Julia Butler Hansen Refuge and Lewis and Clark Refuge are popular destinations for local visitors as well as tourists from outside the area. As stated before, it is difficult to determine exact numbers of visitors to these refuges. However, it is estimated that they attract approximately 29,000 visitor-use days each year. The refuge complex provides funding for one full time visitor services staff member dedicated to public use, education, and volunteer programs for three refuges. Many refuge visitors discover the refuges while on their way to and from other activities and destinations. The refuge staff takes advantage of these educational

opportunities by providing refuge specific information, interpretive panels, and printed materials throughout the area both onsite and offsite.

5.2.2.1 Lewis and Clark Refuge

Wildlife-oriented public use is permitted on all lands within the Lewis and Clark Refuge except for the Brownsmead, Emerald Heights, and Tongue Point Units. Due to the dense vegetation on many of the refuge islands, use is essentially restricted to shoreline locations. The refuge islands of the Columbia River estuary are accessible by boat only. Refuge activities include photography, wildlife observation, fishing, and hunting. Access to Lewis and Clark Refuge requires careful planning due to water conditions (tides and safety). Tidal flows and fluctuations, strong winds, and wakes from ships in the navigation channel can make boating difficult and dangerous. Deep channels separate most of the islands at high tide but tide tables and current navigation charts need to be consulted to avoid grounding on sandbars.

Waterfowl hunting is allowed in all locations except the old diked portion of Karlson Island and the embayment at Miller Sands Island. Both mainland locations (Tongue Point and Emerald Heights) are not appropriate for waterfowl hunting. Fishing is permitted along the shoreline of all refuge islands and in the sloughs and other waters surrounding the islands.

On the refuge islands, enforcement activities most commonly involve illegal camping, commercial guiding of hunters, and various other hunting violations such as over-bag limits or hunting without a license—all of which are currently prohibited on the refuge. Regulatory authority over public use issues including hunting, fishing, and boating is not always clear. In some portions of the refuge, the Service has ownership over the lands and nonnavigable interior sloughs, but does not have authority over the navigable waters of the refuge. In many but not all areas, the State of Oregon has control of all submerged lands below mean high tide (tidelands).

A brief history of refuge management agreements follows.

- When established in 1972, the Service owned only a small portion within the 33,000-acre refuge acquisition boundary of the Lewis and Clark Refuge. Through land management agreements, both the state and county lands within the designated boundaries of the refuge were managed by the Service. Navigable waters on the Columbia River remained under the domain of the State of Oregon.
- The land management agreement with the State of Oregon was canceled in 1994 pending a land trade which involved trading federally owned lands outside the refuge boundary to the State of Oregon in return for state lands within the refuge boundary going to the Service. The trade gave us approximately 75 percent of the state lands within the refuge boundary.
- The land management agreement with Clatsop County expired in 1997. At that time the County was willing to donate its lands to the refuge with the stipulation that historic floathouses within the refuge boundary be allowed to remain.

- Clatsop County donated all county lands (4,535 acres) inside the refuge boundary to the Service in May 2004.
- As of August 2008, a land management agreement with the State of Oregon to manage state lands within the boundaries of the refuge has not yet been implemented.
- Thirty-two Floating Recreational Cabins (FRCs) commonly termed “duck hunting shacks” exist within the boundary of the Lewis and Clark Refuge. Some of these structures are historic, having been located in the same area since the early part of the twentieth century while others were constructed in more recent history (1970s and 80s). The FRCs are located on pilings within the refuge acquisition boundary located on State-owned waters. They are used primarily as recreational hunting and fishing shacks, intermittently throughout the year. The Service’s position on the FRCs has varied since the inception of the refuge. Clatsop County has supported the continued existence of the FRCs and was reluctant to consider transfer of County-owned islands within the refuge boundary to the Service until the issue was resolved.
- All but two of the FRCs are located in navigable waters of the Columbia River and are affixed to mooring pilings that are located on submerged lands owned by the State of Oregon. As the Service does not exert primary jurisdiction for most of the FRCs, an alternative approach involving establishing a Memorandum of Understanding (MOU) with the County, State and FRC owners was initiated. The MOU addressed refuge concerns regarding sanitation, appropriate public use activities, and modification or construction of new facilities. To date, all of the MOUs have been approved, and the County has donated all of its 4,535 acres of Columbia River islands to the refuge.
- On January 22, 2003, Clatsop County passed Ordinance 03-01, which allowed any FRC in existence and legally moored before January 1, 2000, to be considered a legal nonconforming structure, and allowed to remain, if it met ODSL requirements and the Oregon Department of Environmental Quality (DEQ) waste disposal requirements. The ordinance prohibited any new FRCs on the Columbia River and gave FRC owners until January 1, 2006 to become compliant.

5.2.2.2 Julia Butler Hansen Refuge

To reduce disturbance to the CWT deer, public use is restricted to the Steamboat Slough and Brooks Slough Dike roads; the headquarters area; the interpretive area and pull-off along Highway 4; and seasonally, to the Center Road on the Mainland Unit. Public use at the headquarters area includes day use activities which involve use of the public parking lot, restroom, viewing deck, and office reception area. Steamboat Slough Road provides access and opportunities for wildlife viewing, fishing, walking, bike riding, and photography. Uses along the road are not regulated by the refuge because the road is owned by Wahkiakum County. Some motor home and tent camping does occur on the beach shoreline across from the old maintenance shop site. The beach referred to locally as “Hornstra Beach,” is in private ownership and has been the site of occasional problems including beer parties, illegal fires, and trash dumping.

The Center Road hiking trail is open seasonally from June through September to allow visitors to view wildlife from outside their vehicles. However, the only access point for the hiking trail is located at the west end of the refuge. Because the roads surrounding the refuge are elevated on the dikes, they provide better opportunities for visitors to view wildlife than the one way hiking trail on Center Road. There is a significant amount of vehicle traffic on the county roads and the refuge has no management authority over the road system. Other than the seasonal opening of Center Road as a public trail and other administrative sites, all locations interior to the Mainland Unit dikes are closed to public use to protect, reduce, and minimize disturbance to the CWT deer and waterfowl.

The Julia Butler Hansen Refuge islands include; Price, Hunting, Wallace, Crims and the Westport Unit which are all open to the public for day-use wildlife-dependent public uses. Activities on these islands are self limiting due to dense vegetation with public uses generally occurring only on the shorelines of these sites. Waterfowl hunting including geese, ducks, coots, and snipe is permitted along the shorelines of Wallace and Hunting Islands in accordance with state and Federal regulations. Additionally, we are proposing to open the shorelines of Price and Crims Island to waterfowl hunting in this Draft CCP/EIS, including the interior sloughs of Crims Islands.

Waterfowl hunting seasons have generally been open from mid-October through mid-January. Other areas of the refuge are closed to hunting with the exception of the Mainland Unit which has a limited cow elk hunt, first instituted during late fall and winter of 2005/2006. The hunt is intended to reduce elk numbers which have been shown to compete with CWT deer for food and other limited refuge resources, which creates unnecessary stress on the CWT deer population. Environmental assessments have been completed for both the waterfowl and elk hunt programs.

Fishing opportunities on the refuge are permitted in all areas except the areas interior to the Mainland and Tenasillahe Island units' dikes. Fishing is available along Steamboat Slough Road dike which parallels both the Elochoman and Columbia Rivers.

Law enforcement problems are occasionally encountered on the Mainland Unit, but are not widespread, and are often either trespassing and/or vandalism violations. On the refuge islands there has been less intensive oversight of the public use programs. Public use management activities on refuge lands in the river most often deal with the issues of camping and commercially guided hunting, both of which are prohibited on the refuge.

5.2.3 Wildlife-dependent Public Uses

5.2.3.1 Hunting Opportunities

Recreational hunting (a wildlife-dependent activity) has been identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use, provided it is compatible with the purpose for which the refuge was established. Because hunting is one of the six designated wildlife-dependent public uses of the Refuge System, refuges grant these six uses special consideration in planning and management.

5.2.3.2 Lewis and Clark Refuge-Hunting

The majority of the refuge is open to waterfowl hunting with the exceptions of the old diked portion of Karlson Island and the embayment at Miller Sands Island. The closures at these two islands represent lands purchased with Duck Stamp Act funds, which requires 40 percent of the lands/acres to be closed to hunting, and allowing the remainder to be open to waterfowl hunting. Only a handful of islands were purchased with duck stamp funds. The remaining islands were either donated by the State, or purchased with migratory bird conservation funds. The two non-island units, Tongue Point and Emerald Heights, are also closed to hunting. Hunting is consistent with State regulations except as specifically noted herein.

- Geese, ducks, coots, and common snipe are permitted to be taken. Hunting periods and specific species/numbers to be taken are set by the respective state agencies (ODFW and WDFW), to match adjacent areas open to waterfowl hunting. The islands on the lower river differ from islands at Julia Butler Hansen Refuge in that there are more sloughs and interior waterways which make hunting of the islands' interiors much more accessible. Therefore, hunting is allowed in all areas of the lower river islands.
- The hunt areas are on islands in the Columbia River where access is only available by boat. Camping, overnight use and fires are prohibited. Hunters may use dogs to aide in the retrieval of birds but dogs have to be kept under control at all times. Hunters can set up temporary blinds along the shoreline but they must be removed at the conclusion of each hunting day. Only nontoxic shot is allowed for the hunt.

5.2.3.3 Julia Butler Hansen Refuge-Hunting

Waterfowl hunting is one of the more popular recreational activities occurring on the refuge. Approximately 30 percent of the refuge is open to waterfowl hunting. Closed areas include the Mainland Unit, the Tenasillahe Island Unit, Crims Island, Price Island Unit, and the scattered tracts that make up the Westport Unit. Units currently open to hunting include the refuge owned portion of the Hunting Islands and the Wallace Island Unit. We are proposing to open the Crims Island and Price Island units to waterfowl hunting in the preferred alternative of this CCP. We are also proposing to close a small section of Elochoman Slough with WDFW, for safety purposes, due to the proximity of the county road. Waterfowl hunting is permitted immediately adjacent to all refuge lands on waters and tidelands surrounding each of the refuge units owned by the states of Oregon and Washington. These adjacent waters are all tidally influenced, submerged lands below mean high water (MHW), of which the refuge has no jurisdiction. Hunting is consistent with state regulations except as specifically noted herein.

- Geese, ducks, coots, and common snipe are permitted to be taken. Hunting periods and specific species and numbers to be taken are set by the respective state agencies (ODFW or WDFW), to match adjacent areas open to waterfowl hunting. Only the shoreline of the refuge islands are opened for hunting waterfowl, because no potential for a quality hunt exists on the islands' interior as it is comprised of dense forested upland.

- The hunt areas are on islands in the Columbia River where access is only available by boat. Camping, overnight use, and fires are prohibited. Hunters may use dogs to aide in the retrieval of birds; however, dogs have to be kept under control at all times. Hunters can set up temporary blinds along the shoreline, but they must be removed at the conclusion of each hunting day. Only nontoxic shot is allowed for the hunt.

Another type of hunting allowed on the refuge is the Mainland Unit's elk hunt, which is specifically designed to reduce the competition for CWT deer critical habitat. In our Environmental Assessment of Proposed Additions to Julia Butler Hansen (2004) we outlined how elk removal would be managed on the refuge, it involves a three-tiered approach.

- The initial tier includes a State-regulated limited permit muzzleloader hunt with a maximum of 10 permits issued per designated hunt period. The number of permits, number of hunt periods, and type of animals to be taken (cow, spike, bull etc.) is determined annually, based on the number of elk found on the refuge. Permits are not issued for the largest of the refuge's bulls to allow for continued observation and photography opportunities. If population numbers fall below the designated goals of 20 to 30 animals, there is no elk hunting on the refuge until numbers have increased.
- If the limited hunt does not reduce herd numbers to management goals, then the refuge can proceed to a second tier action or primary state backup plan. This action involves a State-regulated special hunt (a specially designated state hunt to control a sudden depredation problem, not necessarily during a designated hunting season) which would have the same general stipulations as the limited permit hunt.
- If management goals are still not met, the refuge could proceed to a third tier action or secondary state backup plan. The third tier would involve either a management cull (elk removed by a professional sharpshooter) or relocation of the elk (elk moved off of the refuge). This state backup plan would be dependent on WDFW policy and preferences at the time the action is required. This three-tiered approach gives the refuge and WDFW a variety of tools to deal with high elk numbers while also addressing State concerns with the current elk relocation process.

As of fall 2007 the refuge has managed three elk hunts. During the first hunt, five elk were removed from the refuge, in the second hunt no elk were removed from the refuge, and in the third hunt one elk was taken. At this time it appears the as-needed hunt program is working well, as current elk numbers (fall 2008) have been reduced to the approximate management level of 20 to 30 animals. However, the potential for elk to access the refuge, and thereby increase elk numbers beyond the management goals, which would trigger a fall hunt, remains a possibility.

5.2.3.4 Fishing Opportunities

With their lengthy shorelines, wide open spaces, and diverse river, slough, and wetland habitats, the waters surrounding both refuges provide opportunities for anglers to catch everything from enormous wild Chinook salmon to a variety of warmwater fish. Fishing continues to be one of

the most popular activities for visitors and local residents near both refuges. It is estimated that more visits are made to the refuges for fishing, than for any other use.

5.2.3.5 Fishing Opportunities-Lewis and Clark Refuge

Visitors to Lewis and Clark Refuge arrive by watercraft on the Columbia River. Locally there are five boat launches which give visitors access to the waters surrounding the refuge Islands Unit. Three boat launches are located on the Washington side of the river, including the Cathlamet Marina, Brooks Slough State Boat Launch, and Wahkiakum Port District 2 Boat Launch adjacent to Vista Park in Skamokawa. Only the Cathlamet Marina has a developed launch site with a concrete ramp, docks, and fuel available with the other two locations only providing a gravel launch ramp. A total of two boat launches are available on the Oregon shoreline. There is a paved launching facility just east of Astoria at the John Day River site, as well as a primitive gravel launch run by Clatsop County located at the upstream portion of the Lewis and Clark Refuge at Aldrich Point near the unincorporated town Brownsmead.

As with the Julia Butler Hansen Refuge, anglers comprise the largest number of refuge visitors, although many who come to fish are probably unaware that they are even near a refuge. Almost all of the fishing occurs by boat on the Columbia River and though much of the fishing in the lower estuary occurs within the acquisition boundaries of the refuge, the refuge has no jurisdictional control over the waters of the Columbia River and other navigable waters in both Washington and Oregon. Fishing from the shorelines of the Islands Unit is relatively uncommon because boat fishing is so much more accessible and successful.

5.2.3.6 Fishing Opportunities-Julia Butler Hansen Refuge

Even though anglers comprise the largest number of refuge visitors, many are probably unaware that they are even on a refuge because the use is somewhat dispersed and not directly managed or regulated by refuge staff. Much of the fishing occurs on the periphery of the Mainland Unit along the outside of the Steamboat and Brooks Slough dike roads where fishing occurs in the Elochoman and Columbia Rivers. Although much of the exterior dike county road is open for fishing, all areas interior to the dike except for the area immediately adjacent to the Brooks Slough tide gate are closed to fishing access to reduce disturbance to the CWT deer. Fishing from the shorelines of the other island units is relatively uncommon although boat fishing is a very popular activity. The refuge has no jurisdictional control over the waters of the Columbia River and other navigable waters in both Washington and Oregon.

There are no refuge owned or managed fishing facilities, although there are three public use boat launch sites within four miles of the Mainland Unit and several others in the vicinity of the upstream managed refuge islands.

5.2.3.7 Wildlife Observation and Photography-Lewis and Clark Refuge

The Lewis and Clark Refuge does not provide any public use facilities, however, the lower river estuary provides a multitude of natural viewing opportunities for visitors to observe and photograph wildlife. Because the refuge is only accessible by watercraft, which allows for

numerous access points, visitation numbers are harder to quantify and visitors are more dispersed than the Julia Butler Hansen Refuge.

5.2.3.8 Wildlife Observation and Photography-Julia Butler Hansen Refuge

Wildlife viewing and photography are popular activities on both refuges. Visitors at the Julia Butler Hansen Refuge can drive along the Steamboat and Brooks Slough Roads to capture views of CWT deer, elk, waterfowl a variety of birds and other nongame species. The viewing deck at the headquarters and the wildlife viewing blinds off of State Highway 4 are the two designated wildlife viewing facilities at the refuge. The viewing site at Highway 4 was originally set up to reduce traffic congestion which occurred when visitors stopped in the highway to watch elk on the refuge. At that time over 120 elk were known to occur on the refuge. With increased emphasis on reducing elk numbers to protect CWT deer habitat, elk are now rarely observed at the viewing site, therefore, this location may be better utilized as an interpretive site.

Because usage patterns for the CWT deer, elk, and other wildlife species are somewhat unpredictable, visitors are likely to see wildlife at just about any location when traveling the county roads that surround the Mainland Unit, which is by far the single most visited unit on the refuge. Other island locations, including Tenasillahe Island, provide limited viewing opportunities due to riparian cover. Because these islands can only be reached by boat, they receive fewer visitors than the Mainland Unit.

5.2.3.9 Environmental Education and Interpretation

Due to the limited staff size for both refuges, very few environmental education activities have taken place on these refuges. Some onsite habitat and wildlife monitoring programs have been established with local high schools. These projects have included amphibian monitoring, weed mapping, and most recently, riparian forest planting in which students planted a 2-acre site near the refuge office. Occasionally when requested, refuge staff members have and will continue to provide talks to local colleges, scouting groups, community organizations, and local schools. Because the visitor services position for the refuge complex resides at Willapa Refuge's headquarters, most of the environmental education programs for the refuges have been focused in the Willapa Bay area. It is expected that in the future, this position will have a greater and more active role in expanding environmental education programs for both Julia Butler Hansen and Lewis and Clark Refuges.

Interpretative information and brochures for both refuges is located at the refuge office/visitor contact station. The refuge office/contact station is open to the public when staff is available to answer visitor's questions. The headquarters observation deck remains open year-round and provides refuge and interpretive information, and a restroom facility. There is also a wildlife viewing site located off Highway 4. This site provides interpretive information for refuge visitors and a view of the refuge pasture and forest habitats. The Lewis and Clark Refuge has several small informational panels at three sites in the lower river (Cathlamet Marina, Vista Park, and the John Day Boat Ramp) including information from the refuge brochure.

5.2.4 Nonwildlife-dependent Recreation

5.2.4.1 Recreational Boating, Waterskiing, Swimming, and Beach Use

Pleasure boating using motor boats, jet skis (also known as personal watercraft or PWC), and canoes or kayaks are popular activities on the Columbia River during the warmer months. Most of the pleasure boating is concentrated near boat launches bordering refuge lands and waters. Facilities used for this activity are discussed under 5.3.2 Fishing Opportunities. Waterskiing, swimming, and beach use also occur during the warmer months, especially on ODSL's dredge spoil areas that are used as beaches, located adjacent to refuge islands. As has been noted elsewhere, because most of the refuges water areas outside of interior dikes are below mean high tide, jurisdiction of these areas reside with the states of Oregon and Washington.

5.2.4.2 Recreational Boating, Waterskiing, Swimming, and Beach Use-Lewis and Clark Refuge

Because 95 percent of the refuge acreage consists of island habitat, visitors to Lewis and Clark Refuge must use some type of watercraft to access it. Nonwildlife-dependent recreation occurs on the refuge, most commonly associated with motorized and nonmotorized boating activities operating in State owned waters. While swimming and jet skiing do occur, these activities happen less in this portion of the lower river due to safety concerns including winds, tides, and numerous submerged objects. As with the Julia Butler Hansen Refuge, the refuge staff does not have firm visitation numbers for visitors partaking in these off refuge, nonwildlife-dependent activities.

5.2.4.3 Recreational Boating, Waterskiing, Swimming, and Beach Use-Julia Butler Hansen Refuge

Boating, waterskiing, and kayaking are most prevalent adjacent to the upstream end of Hunting Islands in the vicinity of Cathlamet Marina and along Steamboat Slough. Nonmotorized boating on the refuge has become increasingly popular, especially in the last 10 years. From the marina down through the Skamokawa area, kayaking is a very common activity throughout most of the year. High winds and rough waters farther downstream in the reaches of the lower river make kayaking and canoeing much more of a challenge, which tends to limit the number of nonmotorized boaters using the mainstem of the lower river from about the Cathlamet area downriver. The refuge does not have firm numbers on the number of visits made to the refuge's islands. Many visitors within the acquisition boundary are there solely for pleasure boating, fishing, waterskiing, swimming, beach use and nonmotorized boating. Other nonwildlife-dependent recreational activities that occur on lands adjacent to the Mainland Unit of the refuge include: dog walking, lighting fireworks, and camping. These activities occur on or along the dike road which is owned and managed by Wahkiakum County.

A private parcel of land referred to as Hornstras Beach located outside the mainland dike immediately adjacent to the county road, consists of old dredge spoil material that has become vegetated with a mix of willows. The property for the most part is unregulated, with camping, dog use, day use activities, and a wide range of other recreational activities both legal and illegal.

5.2.5 Illegal Uses

The most common law enforcement issues encountered in the field are trespass into closed areas, waterfowl hunting violations (lead shot, hunting in closed areas, taking birds out of season, and unplugged shotguns), vandalism (broken gates and defaced signs), theft (stolen gas, tools, equipment, and signs), and illegal camping. There is currently one full time refuge law enforcement officer assigned to cover three refuges within the Willapa Refuge Complex. The refuges' staff coordinates internally with other Federal officers/agents and works with the U.S. Coast Guard as well as state, county and local law enforcement offices.

5.3 Cultural Resources

5.3.1 Native American Cultural History and Landscape

The geographic setting of the two refuges—occupying both islands and mainland along the lower Columbia River—places them at the heart of prehistoric and historic travel, hunting, and resource-collecting routes. The refuges are situated within the traditional domain of the Cathlamet and Wahkiakum groups of Lower Chinookan Indians. Chinookans lived on the Columbia River thousands of years before Euro-American explorers first arrived in the area. Settling in autonomous villages on both shores from its mouth to The Dalles, the Chinookans used the river as a highway to carry trade goods between the coast and interior areas. Their strategic control over the lower Columbia made them wealthy and powerful traders.

The way native inhabitants used the landscape and its resources in pursuit of survival and trade dictates the types of cultural resources that might be expected to occur on the refuges. Their primary subsistence activities focused on riverine resources which would have been abundant in and around the refuges. The single most important resource for both personal consumption and trade appears to have been fish (Gilbow et al. 1981). Small, specially built river canoes were maneuvered around the marshy islands, to fish for salmon, sturgeon, eulachon (candlefish or smelt), and steelhead trout, using spears, seine nets, dip nets, hook and line, and weirs (which sometimes survive in the archaeological record). Mainland game hunting supplemented the Chinookans' diet with species such as deer, elk, bear, cougar, and smaller animals such as beaver and porcupine. A wide variety of roots, shoots, and berries were gathered throughout the area.

While portable dwellings made from cattail mats were erected at seasonal fishing, hunting, and gathering camps (Silverstein 1990:538), the permanent settlements of the Wahkiakum and Cathlamet Indians were the cedar plankhouses characteristic of Chinookan cultures all along the Columbia River. According to Clark, their houses differed from those upriver in a few significant ways, specifically, the use of above-ground construction and doors that opened on the sides of the building (Moulton 1990).

Two villages, “Elochoman” and “Wahkiakum,” appear frequently in the historic and ethnographic record as being situated at the mouth of the Elochoman River where it meets the Columbia (Strong 1906, and Ray 1938). As such, the villages locations would have been within or adjacent to the boundaries of present day Julia Butler Hansen Refuge. Clark, it is believed, was referring to one of the villages when he wrote the following on November 7, 1805.

“...two Canos of Indians met and returned with us to their village which is Situated... behind a cluster of Marshey Islands, on a narrow chanl of the river through which we passed to village of 4 Houses...” (Moulton 1990)

Today those marshy islands are known as the Hunting Islands. The expedition members traded with the villagers, offering fish hooks in exchange for food such as salmon and wapato, and for otter skins which they used for clothing. Later that same day as they were being piloted through the sloughs by an Indian in a sailor’s uniform, they observed a “temporary residence” on another “marshey island,” probably Tenasillahe Island (Moulton 1990). This area on the east side of the island continued to be referenced as a fishing site as late as 1841, when Charles Wilkes noted a “fishery” there during his United States Exploring Expedition (Gilbow et al. 1981).

In addition to documenting the existence of prehistoric and contact-era settlements in the vicinity of the refuges, historical narratives and ethnographies also describe the prominent use of the islands and marshy areas for Chinookan canoe burials (Moulton 1991, Ray 1938). A turn of the twentieth-century account by Thomas N. Strong, son of early settler William Strong, paints a vivid image of this tradition:

Between the Elokomon and the Skamokawa the sloughs were lined with the burial canoes of the dead, as only distinguished men were so buried, this stood for a very large population. . . These canoe burials were ancient to say the least. Cedarwood is almost indestructible and no living Indians knew the name or lineage of the dead. . .” (Strong 1906)

The Wahkiakum and Cathlamet were active participants in the Euro-American trade network that evolved during the first half of the 1800s. But their population numbers dwindled as warfare, liquor, and especially introduced diseases took their toll on the native people of the Columbia River. By the 1840s, few Chinookans remained in their traditional places on the river, and white settlers began arriving in the 1850s.

5.3.2 Euro-American Cultural History and Landscape

5.3.2.1 Early Exploration, Lewis and Clark, and the Fur Trade: 1790s-1840s

The early history of the refuges is dominated by Euro-American exploration and the fur trade on the lower Columbia River from the 1790s to the 1840s. American Captain Robert Gray was the first to make an incursion up the Columbia River in May of 1792. He sailed as far as Grays Bay, anchoring the *Columbia Rediviva* across the river from Tongue Point at what is now the very western edge of Lewis and Clark Refuge. This “discovery” was soon followed by further exploration by the British. In October 1792, Lieutenant William Broughton traveled through both refuges, camping for a night on either Tenasillahe Island or one of the adjacent islands (Gilbow 1981).

Lewis and Clark first passed through Julia Butler Hansen Refuge and the refuge that bears their names 13 years and one month later, paddling downstream from the east. Though their visit was brief, their narratives of the time spent navigating among the islands both in November 1805 and

March 1806 document a landscape and a diversity of flora and fauna that are preserved on the refuges 200 years later. From their campsite of November 26, 1805, on the south shore overlooking the islands of Lewis and Clark Refuge, one of the explorers' observed "We saw along the shore, a number of Islands that lay very low & marshy. The Geese, swan & Ducks are in the greatest plenty at this place, & our Hunters killed a number of them" (Whitehouse, 1804).

The explorers' scientific descriptions of the area's ecology and the physical characteristics, abundance, and range of the flora and fauna also offer a unique glimpse of the Columbia River before modern settlement and development occurred. In addition to the now-endangered Columbian white-tailed deer for which it was established, the Julia Butler Hansen Refuge provides habitat for other species originally described by Lewis and Clark, such as Roosevelt elk and tundra swans. Likewise, the Lewis and Clark Refuge preserves estuarine habitat critical to the survival of fish and wildlife species.

On the heels of the Corps of Discovery came the continental fur trade, which was dominated early on in this area by a company of traders organized by New York merchant John Jacob Astor. Later, the Canadian North West Company and then the Hudson's Bay Company took over operations on the lower Columbia River. Throughout the period from 1810-1846, natives and nonnatives alike traveled the waters between the islands as they plied their trade. Occasional journal references to the names of islands or the people encountered there provide glimpses into the changing status of the natural and cultural landscape. Gilbow et al. (1981) provides a detailed compilation of historic accounts regarding this portion of the Columbia River.

Of particular interest to the history of Lewis and Clark Refuge, are a few mystery-shrouded references regarding an aborted attempt to build a North West Company Fort on Tongue Point. Historic sources suggest that construction began in February of 1814, but by May 1, 1814, the unfinished fort was abandoned abruptly, and without an explanation offered in the historical record (Corbyn 1989). Though no remnants have been found to date, the physical remains of the fort would provide a valuable time capsule for understanding the construction of the trading company's early fortification systems as well as the material culture of the time.

5.3.2.2 Euro-American Settlement, the Fishing Industry, and Farming: 1840s-1970s

Homesteaders began arriving in the lower Columbia River area in the late 1840s, filing land claims wherever the land was suitable for agriculture. Most of the islands, it appears, were considered more valuable for fisheries than farming (Gilbow et al. 1981). Within a few years, in fact, fisheries began to develop in places like the east side of Tenasillahe Island (Tenasillahe Fishery, Mitchel's Fishery on Julia Butler Hansen Refuge) and Welch Island (Fitzpatrick's Fishery, Welch's Fishery on Lewis and Clark Refuge). Structures and docks associated with the fisheries were built as early as the 1850s and in some cases used well into the 1890s. Fish weirs were also constructed in the vicinity of several islands. By the late 1800s into the 1900s, homesteaders were increasingly attracted to the area by the fishing; building small shanties on pilings or platforms along the shorelines of many islands. The nearby communities of Skomakawa and Cathlamet thrived as commercial centers for the salmon fishing and canning industry, as well as the logging industry. Timber was logged for construction but also to feed the

engines of steamboats, which were the primary mode of transportation. Steamboat Slough at the north end of Julia Butler Hansen Refuge is named for the boats that stopped there for fuel wood.

The landscape at Julia Butler Hansen Refuge underwent major environmental changes in the 1920s when the Mainland and Tenasillahe Island units were diked and drained by the newly-formed County Diking District No. 4. Approximately half a dozen families moved into the diked bottomlands which were converted to pastures for grazing dairy and beef cattle. Tenasillahe Island was the site of a dairy and cheese factory. Farming continued for nearly 50 years until the refuges were established in 1972.

Portions of islands within Lewis and Clark Refuge were reclaimed, diked, and drained for farming. For examples, Long Island, where the Brownsmead Unit is located, was diked by the U.S. Army Corps of Engineers in the 1940s. The Brownsmead Unit consists of diked pasturelands, which are now seasonally grazed for the benefit of wintering Canada Geese.

Over the course of the twentieth century, land use on Tongue Point included construction of a submarine and destroyer base during World War I (completed in 1924, but never used); development of a naval air station in World War II for the purpose of coastal seaplane patrols (1939-1946); storage of mothballed naval ships (1946-1962); establishment of a Coast Guard station (1964-1966); and use as a Job Corps Center (1966-present). The forested area on the north end of Tongue Point was acquired by the refuge in 1992.

5.3.3 Archaeological Resources and Historic Properties

Though the historic accounts indicate that native utilization of the area was long and intensive, the constantly changing course of the Columbia River channel and its sloughs, as well as the sedimentation, flooding, subsidence, and erosion of its islands, make the likelihood of discovering intact cultural resources within refuge boundaries fairly remote. Any resources that still exist could be buried under several feet of sediment (Gilbow et al. 1981). In comparison to other areas of the Columbia River, little archaeological investigation has taken place in this region (Minor 1986)

5.3.3.1 Lewis and Clark Refuge

No comprehensive survey or cultural resource overview has been conducted for the refuge. A project-specific survey on the Brownsmead Unit identified no cultural resources (Raymond 1995). The known archaeological sites in the vicinity (0.7 to 2.5 miles away) are located on high ground near sloughs and rivers, rather than the tidally-influenced lowlands and islands that characterize the refuge.

Though the Corps of Discovery camped at the mouth of Mill Creek near Tongue Point on the night of November 26, 1806, the exact location is unknown. Likewise, the exact location of the reported fort construction at Tongue Point is unknown, and no remains have been discovered to date. The entire point has been severely altered as a result of development. Facilities associated with military operations and later, the Job Corps Center still exist at Tongue Point adjacent to refuge boundaries.

5.3.3.2 Julia Butler Hansen Refuge

An archaeological survey and cultural resource overview of the Mainland, Hunting Islands, and Tenasillahe Island units was conducted in 1980 by faculty and staff of Eastern Washington University (Gilbow et al. 1981). Dense vegetation hindered survey efforts and restricted the intensity of coverage, though auger testing was conducted to augment the surface survey. The archival research conducted in conjunction with the survey generated a detailed history of this portion of the Columbia River which is useful as a reference. No evidence of the two village sites (WK-10 and WK-11, recorded but apparently not located on the ground by Smith and Hudziak in 1948), the Tenasillahe Island fishing encampment (no site number), or any other cultural resource was identified as a result of the survey. Since then, other units have been acquired by the refuge. These include portions of Crims Island (originally named “Fanny’s Island” by Clark after his sister) (2003); Wallace Island (1995); and some small parcels near Westport, Oregon (1995-1996). No surveys or sites have been documented on these parcels.

Project-specific archaeological surveys have been conducted by the Service’s archaeologists for refuge construction and restoration activities on the Mainland and Tenasillahe Island units in compliance with Section 106 of the National Historic Preservation Act (NHPA) (Bourdeau 1995, Bourdeau 2001, Raymond 1993, Speulda 2005). No cultural resources have been discovered as a result of these surveys.

At least 30 of the floating houses still exist along the island margins, but they are privately owned, and are not within the jurisdiction of the Service. No other remains of the structures, docks, or weirs associated with the fishing industry are visible today. Many of the farm buildings were moved or demolished at the time of acquisition by the refuge. One of the few exceptions is Quarters 36, a small gothic arch barn built in 1937 by former landowner A.P. Hebeisen. It was acquired by the Service in 1972, though Mr. Hebeisen continued to live in it. By 1977 it was used for housing a Service employee. It was damaged by flooding in 1996 and finally slated for removal in 2005. The structure was evaluated for its historic significance and determined ineligible (Speulda 2005). It was removed from the refuge in 2006 due to lead paint issues.

5.4 Social and Economic Conditions

5.4.1 Population, Housing, and Income

5.4.1.1 Lewis and Clark Refuge

The Lewis and Clark Refuge is situated entirely within Clatsop County, Oregon. The nearest communities are Knappa and Astoria, Oregon, and the community of Skamokawa, Washington. The population of Clatsop County is approximately 37,000 people and its population growth has been less than the State’s average. However, because of the proximity of the refuge to population centers in the Portland/Vancouver areas of northwest Oregon and southwest Washington, the refuge can expect much greater pressure for recreational use in the future.

5.4.1.2 Julia Butler Hansen Refuge

The refuge is mainly situated in Wahkiakum County, Washington, and Clatsop County, Oregon, though parts of the refuge (Crims Island and Wallace Island) extend into Columbia County, Oregon. Cowlitz County, Washington is directly adjacent to the upstream Crims Island Unit. The nearest communities include Cathlamet and Skamokawa, Washington, and Westport and Clatskanie, Oregon. The Mainland Unit is close to the town of Cathlamet, Washington (see Map 2). The population base is rather small in Wahkiakum County mainly due to its rural nature and limited industrial infrastructure.

The refuge area's population as a whole is growing at a slower rate than the rest of the State, except for population growth in Columbia County, Oregon which is growing at a rate of 13 percent annually. Overall populations of the local counties of Columbia, Cowlitz, and Wahkiakum are smaller than the states' average. The refuge can expect greater pressure for recreational use in the future due to the proximity of the refuge to large population centers in the Portland/Vancouver areas of northwest Oregon and southwest Washington. Table 5.2 shows the populations of each of the relevant counties, growth rates, and other social statistics collected by the U.S. Census Bureau.

Table 5-2 Selected Population and associated Social Statistics, Local Counties

Population Parameter	Wahkiakum County	Cowlitz County	Washington	Clatsop County	Columbia County	Oregon
Population, 2006 estimate	4,026	99,905	6,395,798	37,315	49,163	3,700,758
Population, percent change April 1, 2000 to July 1, 2006	5.3%	7.5%	8.5%	4.7%	12.9%	8.2%
Population, 2000	3,824	92,948	5,894,121	35,630	43,560	3,421,399
Persons under 5 years old, percent 2005	3.5%	6.0%	6.3%	5.1%	5.6%	6.2%
Persons under 18 years old, percent, 2005	19.4%	24.3%	23.6%	21.3%	24.1%	23.3%
Persons 65 years old and over, percent, 2005	20.1%	13.5%	11.5%	15.9%	11.3%	12.9%
White persons, percent, 2005	96.1%	94.1%	85.0%	95.3%	95.4%	90.8%
Black or African American persons, percent, 2005	0.3%	0.7%	3.5%	0.8%	0.5%	1.8%
American Indian and Alaska Native persons, percent, 2005	1.7%	1.6%	1.7%	1.1%	1.4%	1.4%
Asian persons, percent, 2005	0.5%	1.3%	6.4%	1.3%	0.7%	3.4%
Native Hawaiian and Other Pacific Islander, percent, 2005	0.0%	0.1%	0.5%	0.1%	0.1%	0.3%

Population Parameter	Wahkiakum County	Cowlitz County	Washington	Clatsop County	Columbia County	Oregon
Persons reporting two or more races, percent, 2005	1.4%	2.1%	3.0%	1.4%	2.0%	2.3%
White persons, not of Hispanic/ Latino origin, percent, 2005	93.6%	89.0%	77.1%	89.7%	92.3%	81.6%
Persons of Hispanic or Latino origin, percent, 2005	2.6%	5.6%	8.8%	6.1%	3.3%	9.9%
Living in same house in 1995 and 2000, percent age 5+, 2000	62.2%	52.6%	48.6%	47.9%	53.4%	46.8%
Foreign born persons, percent, 2000	1.3%	3.7%	10.4%	4.2%	1.8%	8.5%
Language other than English spoken at home, percent age 5+, 2000	4.3%	6.0%	14.0%	7.1%	3.9%	12.1%
High school graduates, percent of persons age 25+, 2000	84.2%	83.2%	87.1%	85.6%	85.6%	85.1%
Bachelor's degree or higher, percent of persons age 25+, 2000	14.8%	13.3%	27.7%	19.1%	14.0%	25.1%
Homeownership rate, 2000	79.7%	67.6%	64.6%	64.2%	76.1%	64.3%
Housing units in multi-unit structures, percent, 2000	4.7%	18.7%	25.6%	22.0%	11.5%	23.1%
Median value of owner-occupied housing units, 2000	\$147,500	\$129,900	\$168,300	\$143,400	\$150,700	\$152,100
Households, 2000	1,553	35,850	2,271,398	14,703	16,375	1,333,723
Persons per household, 2000	2.42	2.55	2.53	2.35	2.65	2.51
Median household income 2004	\$41,344	\$41,893	\$48,438	\$37,703	\$49,277	\$42,568
Per capita money income 1999	\$19,063	\$18,583	\$22,973	\$19,515	\$20,078	\$20,940
Persons below poverty, percent, 2004	9.8%	14.3%	11.6%	13.0%	9.5%	12.9%

Source: U.S. Census Bureau, State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing, 1990 Census of Population and Housing <http://quickfacts.census.gov/>.

5.5 Environmental Consequences (Effects to the Social and Economic Environment)

In this section, we provide an analysis of the environmental consequences of implementing the alternatives described in Chapter 2. Effects addressed under this chapter will include public use, hunting, fishing, wildlife viewing, photography, environmental education, interpretation, nonwildlife dependent recreation, and law enforcement. A summary of the cumulative effects from implementing the various alternatives are presented in Chapter 6.

We began this section with an assessment of the change in refuge user groups expected under each of the alternatives. Following this assessment, how management actions under each alternative could affect quality opportunities for each of the wildlife-dependent public uses is evaluated. In addition, opportunities for nonwildlife-dependent public uses are examined, as is the amount of illegal uses.

Adverse effects to opportunities for recreational public uses would be considered significant if a proposed action resulted in:

- Substantial displacement of a wildlife-dependent public use (more than 25 percent of existing activities or opportunities moved to a different area or terminated at the refuge); or
- Substantial reduction in the quality of the wildlife-dependent experience (crowding increasing by more than 50 percent 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 (more than 25 percent increase over existing opportunity or quality of experience).

5.5.1 Projected Future Public Uses

A growing visitor presence on the refuges can be expected in the future under all alternatives. Many of the public use opportunities currently provided on the refuges are very popular activities within the states and are forecasted to attract more participants in the coming years.

A 2002 report by Washington State's IAC (IAC 2002) estimated the percent of change in the number of people participating in recreational activities in the future compared to current levels. According to the study, it is estimated that "nature activities," including outdoor photography and wildlife observation, will increase 30 percent during the next 15 years. Hunting and fishing are expected to decrease (18 percent and 8 percent respectively) during the next 15 years. The IAC's estimates for future use were used in calculating future visitor activity numbers for Julia Butler Hansen and Lewis and Clark refuges. In alternatives that improve or add visitor facilities, additional visitation is likely to occur and increase use of the refuges above IAC's estimates.

It is important to consider the significant amount of population growth forecasted for the Longview, Portland, and Seattle areas. Population growth will occur regardless of which alternative is selected. Population growth and increasing demand for recreation, particularly in nature activities will increase on the refuges.

Tables 5.3 and 5.4 show refuge visitation (number of refuge visits annually) estimates for each refuge, under several categories, both current and expected under the different alternatives.

These estimates are based on two factors. The first factor is the percent of change in the number of people participating in a recreational activity in the future compared to the current levels. Future participation rates are based on the IAC’s 2002 *Estimates of Future Participation in Outdoor Recreation in Washington State* (IAC 2002). Projected population growth is incorporated into these figures already. Some activities offered at the refuges do not correspond exactly to the categories used in the IAC reports—the nearest equivalent was used. The second factor is that alternatives that emphasize or improve facilities for a type of recreational activity are given additional weight of 10 percent; those that diminish opportunities are reduced.

Table 5-3 Julia Butler Hansen Refuge’s Projected Annual Visitation in 15 Years, by Alternative

Recreational Activity	Current Visitation	IAC Project Change 1	Alt. 1	Alt. 2	Alt. 3
Waterfowl Hunting	1,200 visits	-17%	1,200 visits	1,600 visits	1,200 visits
Fishing	4,500 visits	-7.5%	4,120 visits	4,400 visits	5,000 visits
Environmental Education/ Interpretation	600 visits	+30%	780 visits	900 visits	1,500 visits
Wildlife Observation/ Photography	6,700 visits	+30%	8,700 visits	9,400 visits	1,1000 visits

1. The IAC report estimated percent changes over 10 year intervals and 20 year intervals. The two intervals were averaged for our purposes in estimating changes over the 15-year lifetime of the CCP.

Table 5-4 Lewis and Clark Refuge’s Projected Annual Visitation in 15 Years, by Alternative

Recreational Activity	Current Visitation	IAC Project Change 1	Alt. 1	Alt. 2
Waterfowl Hunting	3,500 visits	-17%	2,900 visits	3,200 visits
Fishing	800 visits	-7.5%	740 visits	1,000 visits
Environmental Education/ Interpretation	See Julia Butler Hansen Refuge			
Wildlife Observation/Photography	3,100 visits	+30%	4,030 visits	4,600 visits

1. The IAC report estimated percent changes over 10 year intervals and 20 year intervals. The two intervals were averaged for our purposes in estimating changes over the 15-year lifetime of the CCP.

2. Although statewide decreases in hunting are expected by the IAC, the popularity and status of hunting programs at these refuges, together with anticipated habitat improvements led the Planning Team to anticipate that there would be no change in hunter visits over the next 15 years.

3. Environmental Education on the refuge is limited by refuge staffing and volunteers devoted to presenting EE programs.

5.5.2 Opportunities for Quality Wildlife Observation and Photography

Adverse effects are not expected under any of the alternatives, because none of the alternatives are expected to result in increasing crowding by more than 50 percent or in substantial anticipated losses of wildlife or habitat supporting the wildlife viewing or photography experience for either refuge. Visitation is expected to increase under all alternatives and most likely on Julia Butler Hansen Refuge, due to regional population increases, easy vehicular access, compared to Lewis and Clark Refuge, and the overall growing popularity of wildlife viewing and photography.

5.5.2.1 Lewis and Clark Refuge

No changes to facilities are planned under Alternative 1. Growth in wildlife observation and photography is expected to remain unchanged on the Lewis and Clark Refuge. There may be a slight increase in visitors on the river with the current popularity of nonmotorized boating. Most visitor activity is expected to remain on the State-owned waters. A boat is required to access the refuge's islands; therefore, effects from public visitation are expected to be essentially unchanged.

The effects under Alternative 2 would be considered minor to generally an overall neutral effect with the water trail partnership. The proposed actions are not expected to increase the opportunities for or quality of wildlife viewing or photography by 25 percent or more over the existing conditions. A boat is required to access the refuge's islands; therefore, the overall effects associated with public visitation are expected to be the same as Alternative 1.

5.5.2.2 Julia Butler Hansen Refuge

No changes to facilities would occur under Alternative 1. The potential growth in the general population and potential demands for more recreational opportunities such as wildlife observation and photography may increase visitation. The number of facilities available to accommodate the visitors under this alternative would remain the same.

Facilities to improve opportunities for wildlife observation and wildlife photography (trail additions) would be expanded and enhanced under Alternative 2, and to a somewhat greater extent, under Alternative 3 (trail additions and auto pull outs). These facility improvements would improve wildlife viewing and photography opportunities. Alternative 2 emphasizes improved refuge habitat management and CWT deer management. It would be reasonable to assume that additional habitat improvements proposed under this alternative would improve opportunities for viewing wildlife and photography. Alternative 3, which emphasize wildlife-dependent public uses, may also improve the chances for visitors to observe and photograph a greater spectrum of native plants and animals.

Under Alternatives 2 and 3, the minor positive effects stemming from facility enhancements would not be considered significant, because the proposed actions are not expected to increase the opportunities for, or quality of, wildlife viewing or photography by 25 percent or more over existing conditions.

5.5.3 Opportunities for Quality Hunting

In each of the alternatives presented we strived to provide a quality hunting program in concert with other wildlife-dependent public uses and habitat programs on the refuge. No significant adverse effects are expected under any of the alternatives presented, because none of the alternatives as presented would displace any hunting activities. None of the alternatives are expected to result in increasing crowding by more than 50 percent or in substantial anticipated losses of wildlife or habitat supporting the quality hunting experience for either refuge. It is likely that hunting as an activity, may decrease in popularity in the future as described and referenced in section 5.5.1.

5.5.3.1 Lewis and Clark Refuge

There are no significant changes identified in the waterfowl hunting program between the two alternatives. In both alternatives we strived to provide a quality hunting program in concert with other wildlife-dependent public uses and habitat programs on the refuge. The proposed actions under both alternatives, which include improved signage, updated maps, hunting brochures, and increased law enforcement, would result overall in a neutral effect on opportunities for quality hunting experiences.

5.5.3.2 Julia Butler Hansen Refuge

Under Alternative 1, waterfowl and snipe hunting would continue to be allowed on Hunting and Wallace Islands. Waterfowl hunting would not be allowed for safety purposes on Elochoman Slough between Hunting Island and the Mainland Unit dike. This change would have only a minor to neutral effect to the waterfowl hunt program since there has never been much hunting pressure in this area, and there is ample space available to accommodate the anticipated numbers of hunters in this area.

Under Alternatives 2 and 3, Crims and Price Islands would be added to the waterfowl and snipe hunt programs. The other change under alternatives 2 and 3 would be the closure of hunting on the lower Elochoman Slough between the Mainland Unit dike and Hunting Islands because of potential safety issues due to the close proximity of hunting activities adjacent to the county road/refuge auto tour loop. Overall, these changes would have a minor positive effect to the waterfowl hunting program.

5.5.4 Opportunities for Quality Fishing

5.5.4.1 Lewis and Clark Refuge

Most of the fishing occurs from boats on the state navigable waterways on the Columbia River and its backwater sloughs and channels adjacent to the refuge lands. Although a boat is required to access the refuge islands, the shorelines of refuge islands receive little or no fishing use because fishing success is generally better from a boat. Because there are no changes proposed for the refuge fishing program, fishing opportunities are expected to remain unchanged.

5.5.4.2 Julia Butler Hansen Refuge

Fishing opportunities on the Mainland Unit occur along Steamboat Slough and Brooks Slough Roads which are both county roads and which overlay refuge lands. Additional fishing occurs along the narrow strip on the outside of the Mainland Unit dike. All other areas of the interior Mainland Unit, (except the seasonal walking trail) are closed to all public access including fishing. In addition, the interior of Tenasillahe Island is closed to all public access including fishing.

A boat is required to access the other refuge units; therefore, although technically open to fishing, the shorelines of refuge islands receive little or no fishing use because fishing success is generally better from a boat. Proposed changes to the fishing program include improved signage, updating of maps and fishing information, and increased law enforcement, which would have no effect on fishing opportunities.

5.5.5 Opportunities for Quality Environmental Education and Interpretation

5.5.5.1 Lewis and Clark Refuge

Because the refuge largely consists of islands located in the Columbia River, hosting environmental and interpretive programs on the refuge is largely impractical. Therefore, the focus of any environmental education activities would be on the Mainland Unit of the Julia Butler Hansen Refuge. Environmental education/interpretation (EEI) activities would remain similar under both alternatives, resulting in identical effects.

5.5.5.2 Julia Butler Hansen Refuge

The Mainland Unit would be the focus of most EEI activities due to the relatively easy access to the sites. Interpretation infrastructure at the headquarters and Highway 4 sites will continue to be used with new and improved interpretive panels being developed at the Highway 4 site under alternatives 2 and 3. Due to minimal staff availability and workload—only one biologist and one manager available onsite, the refuge will rely on the expertise of the visitor services park ranger located at the Willapa Refuge’s headquarters to oversee most EEI activities. In addition, by partnering with other organizations and local schools, partnerships will provide information to the public about topics of concern and interest regarding endangered species, water quality, and refuge goals. Because EEI activities would be essentially similar under all alternatives, differences in effects would be minimal.

5.5.6 Opportunities for Quality Nonwildlife-dependent Recreation

Nonwildlife-dependent recreational uses are refuge uses that are unrelated to wildlife recreational activities and may include such things as camping, swimming, running, picnicking, boating, etc. There are no proposed or current plans to manage for nonwildlife-dependent recreational activities for either refuge. Recreation alternatives for both refuges are geared toward the priority wildlife-dependent public uses. These uses include wildlife observation, wildlife photography, environmental education, environmental interpretation, hunting, and

fishing. Opportunities for other public and refuge uses not considered priority public uses would be contingent on the completion of refuge compatibility determinations for each appropriate use. Some of these uses are described in Appendix B.

5.5.7 Illegal Uses

All public use alternatives for both refuges include a strategy for increased law enforcement presence to ensure a safe and quality recreational experience for refuge visitors. Effects from this increased law enforcement presence would result in minor positive effects by improving visitor safety and habitat and wildlife protection.

5.5.8 Cultural Resources

While no cultural resources have been located on either of the refuges, the historic record indicates the existence of at least four sites (three at Julia Butler Hansen Refuge and one at Lewis and Clark Refuge). Therefore, these areas should be considered sensitive. Cultural resources have the potential to be directly affected by ground-disturbing activities such as facilities construction or dike repairs as well as indirectly by activities that increase public access to sensitive cultural areas.

As described in the alternatives, proposed activities such as wildlife observation, interpretation, photography, and environmental education, when confined to nonsensitive cultural areas, result in minimal to no effects on cultural resources. Moreover, public programs that include interpretation of the cultural history of the refuges provide an educational benefit.

The management of any cultural resources located will comply with the regulations of Section 106 of the National Historic Preservation Act (NHPA). Therefore, determining whether a particular action within an alternative has the potential to affect cultural resources is an ongoing process that occurs within the planning stages of each project.

Section 110 of the NHPA stipulates the implementation of a program by the agency to identify and protect historic properties, including evaluation of properties eligible to be on the National Register of Historic Places (NRHP). To that end, ongoing efforts should be made to locate and evaluate known ethno-historic sites, if they still exist, and to conduct systematic archaeological surveys of newly acquired parcels to identify cultural resources.

5.5.9 Environmental Justice

Since the CCP implementation is expected to result in generally positive effects on the human environment, all proposed public use actions have little risk of resulting in disproportionate adverse effects on human health, economics, or the social environment.

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