

COLUMBIAN WHITE-TAILED DEER TRANSLOCATION DRAFT ENVIRONMENTAL ASSESSMENT

Proposed Translocation of Deer from the Julia Butler Hansen Refuge for the Columbian White-tailed Deer and Puget Island to Ridgefield National Wildlife Refuge and Cottonwood Island

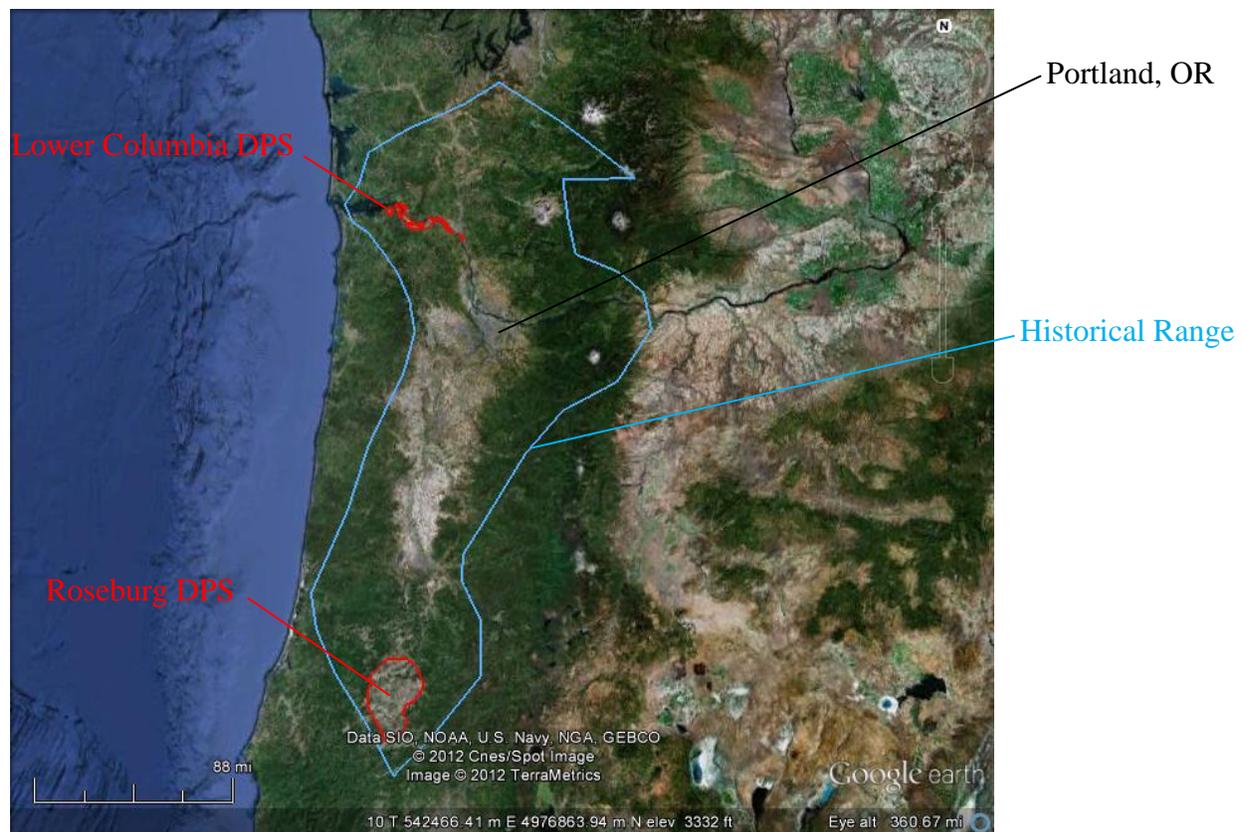
Julia Butler Hansen Refuge for the Columbian White-tailed Deer
Ridgefield National Wildlife Refuge
Wahkiakum and Clark County, WA

CHAPTER 1. PROPOSED ACTION

1.1 Introduction

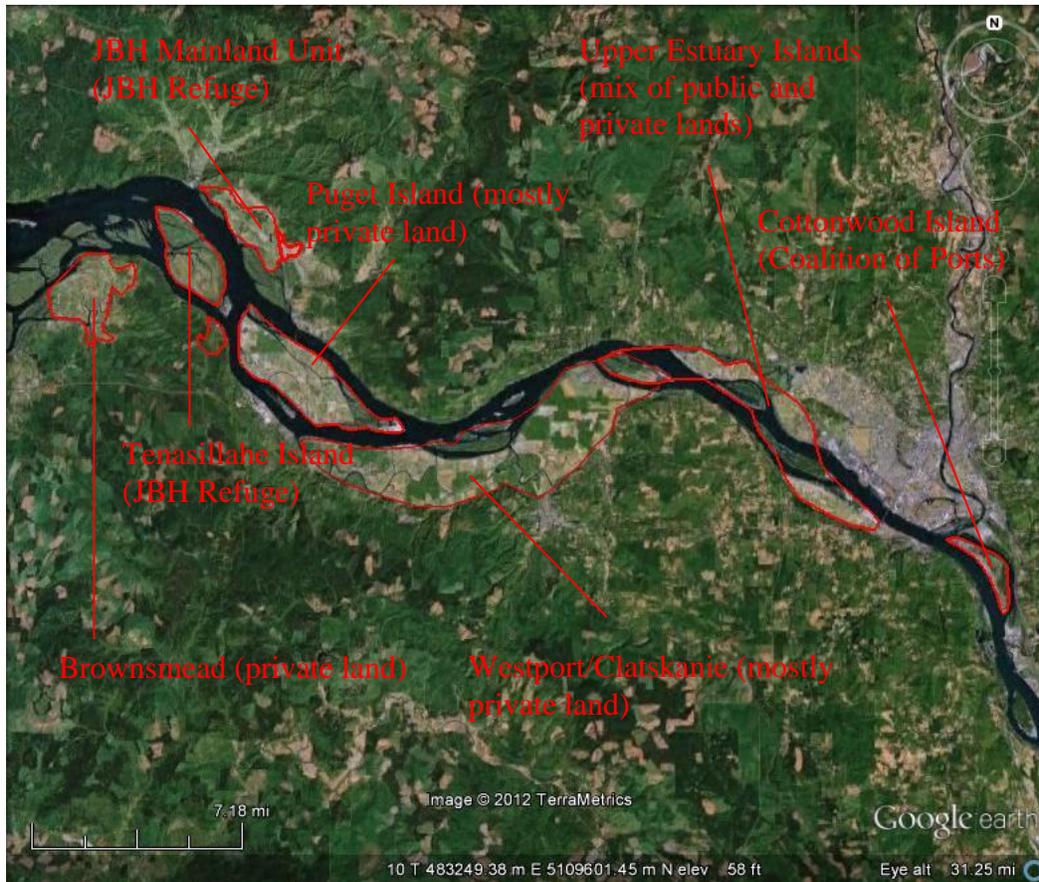
Columbian white-tailed deer (CWTD—*Odocoileus virginianus leucurus*) exist as two Distinct Population Segments (DPS). The Douglas County DPS in Oregon contains over 6,000 animals and was delisted in 2003. The lower Columbia DPS occurs in the Columbia River floodplain in Washington and Oregon and is listed as endangered under the Endangered Species Act (ESA) (fig. 1). The Julia Butler Hansen Refuge for the Columbian White-tailed Deer (JBH) Refuge near Cathlamet, WA supports nearly 40 percent of the lower Columbia DPS.

Figure 1. Current range (red) and historical range (blue) of CWTD.



Habitat for the lower Columbia DPS is fragmented, and the population exists as a series of subpopulations separated by habitat barriers (fig. 2). According to recovery criteria developed for the Revised Columbian white-tailed deer Recovery Plan (USFWS 1983), the subpopulations are considered viable and secure if they support 50 or more animals and are not under threat of development or radical change. This viable and secure designation has become an important benchmark for recovery purposes and has been used to outline delisting criteria. Currently two subpopulations meet the definition of viable and secure: Tenasillahe Island and the Mainland Unit—both on the JBH Refuge. The Mainland Unit supports approximately 70–90 deer and represents about 13 percent of the total DPS.

Figure 2. Current Range of the Lower Columbia DPS and approximate subpopulation boundaries. Two viable and secure populations exist at the JBH Mainland Unit and Tenasillahe Island.

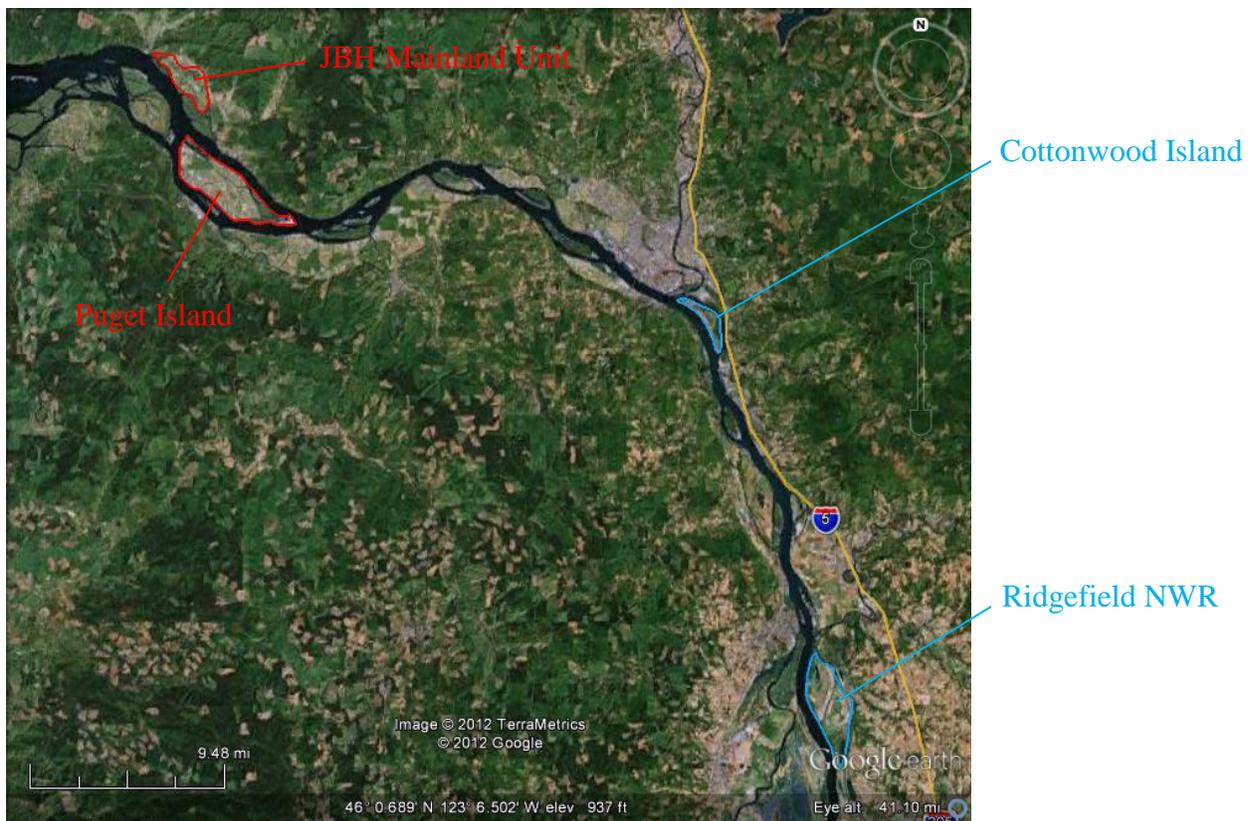


In March of 2011, refuge personnel discovered a site of erosion in the dike that prevents the Columbia River from flooding the JBH Mainland Unit. The erosion has progressively worsened, leading to the closure of the road (Steamboat Slough Road) that runs atop the dike. A geotechnical assessment revealed the dike to be at “imminent risk” of failure. A dike breach at this location would result in the flooding of JBH Mainland Unit at high tides. Prior week-long

floods of this unit have reduced deer numbers substantially, but it is expected that daily flooding from a breach at this location could substantially reduce or eliminate this secure subpopulation.

A breach in the dike could occur before repair or stabilization can be effected. Therefore, the U.S. Fish and Wildlife Service (Service) proposes to translocate approximately half of the deer on the JBH Mainland Unit to the Ridgefield National Wildlife Refuge (Ridgefield NWR). In addition the Service proposes to stabilize an existing small subpopulation at Cottonwood Island by translocating 15 deer from Puget Island (fig. 3). In conjunction with the Ridgefield translocation, the Service proposes to implement an animal damage management (ADM) strategy for landowners near Ridgefield NWR. The purpose of this Environmental Assessment is to evaluate these proposed actions.

Figure 3. Capture sites (red) and release sites (blue).



1.2 Mission of the National Wildlife Refuge System

The Service established the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

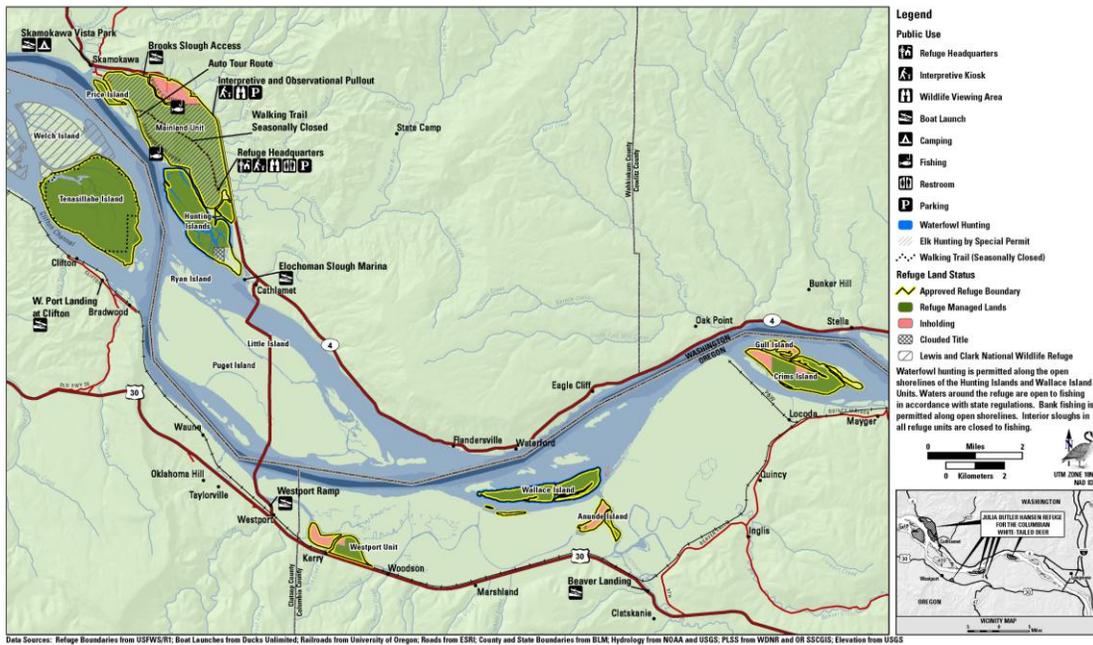
1.3 Purpose and Goals of the Julia Butler Hansen Refuge

The JBH Refuge was established in 1971 to protect and manage habitat for CWTD. The Refuge contains over 6,200 acres of fields, forested tidal swamps, brushy woodlots, marshes and sloughs along the lower Columbia River in both Washington and Oregon. The Refuge is broken into 6 principal units: Mainland Unit, Hunting Islands, Price Island, Tenasillahe Island, Wallace Island and Crims Island (fig. 4). The Refuge is managed by the Service and is one of more than 550 National Wildlife Refuges in the United States.

The goals of the JBH Refuge (USFWS 2010¹) are as follows:

- Provide short-grass fields for the benefit of CWTD, dusky Canada geese, and other grassland-dependent wildlife.
- Restore and maintain riparian forests with diverse age and structural features characteristic of the historic lower Columbia River
- Restore and maintain nontidal wetlands and sloughs as a mosaic with other refuge habitat types, especially riparian forest and short grass fields
- Maintain and protect tidally influenced freshwater wetlands and swamp habitats characteristic of the historic lower Columbia River
- Maintain a healthy, sustainable population of endangered CWTD to promote the recovery of this species
- Provide and encourage establishment of aquatic habitat conditions that benefit salmonids and other native aquatic species of the lower Columbia River
- Gather scientific information (inventories, monitoring, research, and studies) in support of adaptive management decisions on the Refuge
- Provide refuge visitors with the opportunity to participate in wildlife observation, hunting, fishing, photography, interpretation, and environmental education

Figure 4. Julia Butler Hansen Refuge (green) and inholdings (pink).



1.4 Purpose and Goals of the Ridgefield NWR

The Ridgefield NWR was established in 1965 to provide wintering habitat for dusky Canada geese and other waterfowl, provide breeding and migration use (by waterfowl), and provide substantial public shooting opportunities. While these remain the primary purposes for the refuge, as lands were acquired, purposes for those additional lands were identified as follows:

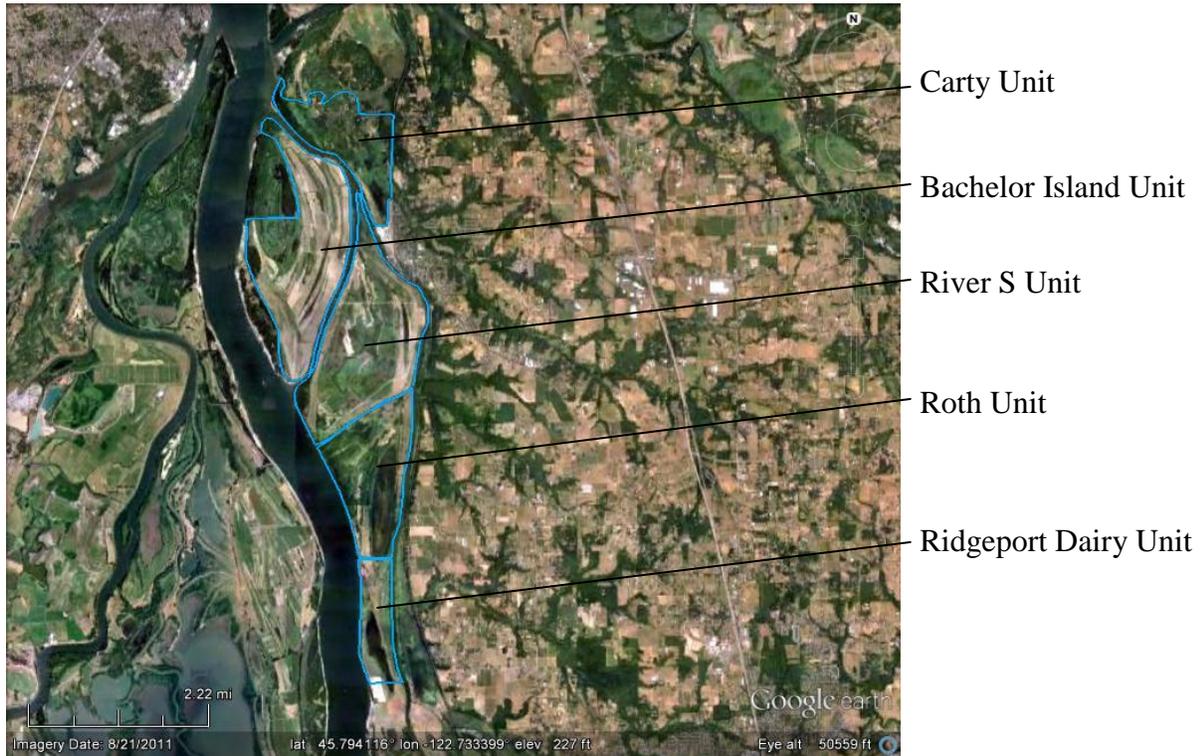
- To preclude uses that would be incompatible with wildlife use, such as industrial, commercial, or residential development, and to gain the capability to manage the land for increased wildlife benefits. (Bachelor Island and Ridgeport Dairy Units, Tract 14, Roth Unit)
- To prevent major changes in the present pattern of wildlife use (Ridgeport Dairy Unit)
- For the development, advancement, management, conservation and protection of fish and wildlife resources (Fish and Wildlife Act of 1956) (Ridgeport Dairy Unit)
- To preserve a major wintering area for migratory waterfowl along the Pacific coast (Roth Unit, Tracts 14, 14a)

The refuge consists of 5 units (fig. 4). In addition to dusky Canada geese and other migratory waterfowl, the following species or species groups were identified as management priorities for the Bachelor Island Unit, Ridgeport Dairy Unit, and Tract 14 of the Roth Unit: bald eagle, sandhill crane, great blue heron, peregrine falcon, shorebirds, marshbirds, and songbirds.

The goals of the Ridgefield NWR (USFWS 2010²) are as follows:

- Provide and manage a mixture of secure, diverse, productive grassland habitats for foraging migratory waterfowl and grassland-dependent wildlife.
- Provide agricultural crops as forage for migratory waterfowl and sandhill cranes annually.
- Provide, manage, and enhance a diverse assemblage of wetland habitats characteristic of the historic lower Columbia River.
- Protect, manage, and restore a natural diversity of native floodplain forests representative of the historic lower Columbia River ecosystem.
- Protect, manage, and restore a natural diversity of native upland forests representative of the historic lower Columbia River ecosystem.
- Protect, enhance, and where feasible restore riverine habitat and tidal wetlands representative of the historic lower Columbia River ecosystem, to benefit salmonids and other native aquatic species.
- Collect scientific information (inventories, monitoring, and research) necessary to support adaptive management decisions on the refuge.
- Protect and manage cultural resources for their educational, scientific, and cultural values for the benefit of present and future generations of refuge users and communities.
- Provide waterfowl hunters of all abilities a quality, safe hunting program that provides a variety of waterfowl hunting experiences, promotes youth hunting, balances hunt program needs with other public use program needs, and reduces impacts to nontarget species.
- Provide visitors of all abilities the opportunity to participate in safe, quality wildlife-dependent recreation programs, including wildlife observation, photography, interpretation, and fishing, consistent with the needs of other public use programs, with limited wildlife disturbance in the face of increasing Refuge visitation. These programs will focus on enhancing public understanding and appreciation of wildlife and building support for the refuge.
- Provide interpretation of the refuge's cultural resources and the Cathlapotle Plankhouse to enlighten visitors about the refuge's unique natural and cultural history.
- Provide quality environmental education programs for Southwest Washington students on the refuge that meet State educational requirements and provide safe and memorable experiences that foster a connection with nature and the refuge.

Figure 4. Ridgefield NWR Units.



1.5 Need for the Action

The CWTD delisting criteria require a total of at least 400 animals, with 3 secure subpopulations of 50 or more (USFWS 1983). The total population of the Columbia River DPS is currently estimated at about 600 animals with two secure subpopulations of over 50 animals, one of which is the JBH Mainland Unit subpopulation. A dike breach on the JBH Mainland Unit would lead to nearly daily flooding of most of the Unit and could substantially reduce and possibly eliminate this secure subpopulation.

The JBH Mainland Unit currently supports about 70–90 deer (USFWS 2012¹). During temporary, week-long floods in 1996, 2006, and 2009 almost all deer temporarily left the Refuge and returned after the waters receded. This movement on and off the Refuge led to increased mortality and an overall loss in numbers. The daily flooding that would result from a dike breach would probably increase the frequency of this movement, increase mortality, and reduce the number of returning deer. A similar dike breach on Karlson Island in the lower Columbia River eliminated the small herd there, and islands in the Lewis and Clark Refuge that undergo daily inundation support few if any deer. It is believed that a dike breach could lead to the elimination of all but a handful of deer.

A loss of this subpopulation would represent a significant setback in efforts to recover CWTD.

The Mainland Unit is an important CWTD subpopulation for this DPS, not only because it is one of two viable and secure subpopulations, but also because of its relative genetic purity and low risk of further hybridization with black-tailed deer.

The proposed action would also stabilize a small population of CWTD in the Cottonwood Island area that was introduced to the island in 2010. Cottonwood Island is considered secure habitat, and the Service would like to establish a subpopulation there. Currently the herd is thought to be isolated from the nearest subpopulation in the Willow Grove and Barlow Point industrial area. The founding number of this herd is only 6 animals, which puts it at high risk for inbreeding, hybridization, or extinction. Maintenance of the Cottonwood Island subpopulation requires augmenting the herd with addition adult CWTD.

1.6 Purpose for the Action

The Service considers the proposed action to be an emergency translocation based on the imminent failure of Steamboat Slough dike. Based on the threat to the CWTD subpopulation on the JBH Mainland Unit, the Service proposes to establish a new secure subpopulation by translocating animals that are in the potential flood zone. If the Service can relocate at least half of the deer from the JBH Mainland, there is high probability that the relocated deer will establish a new secure subpopulation, thus maintaining the recovery trajectory for the species.

In addition, translocation of animals to Cottonwood Island is expected to ensure the continuation of that subpopulation. Given the likelihood of the loss of the JBH Mainland herd and the time needed to establish a new secure subpopulation, enhancing the Cottonwood herd will further stabilize the overall population.

1.7 Decisions to be Made

Based on the analysis documented in this EA, the Regional Chief of the National Refuge System, Pacific Region, for the Service will determine which alternative to adopt and whether the selected alternative would have significant impacts on the quality of the human environment.

1.8 Public Involvement

Interested individuals, organizations, and agencies will have a 30-day comment period to review this draft EA. To facilitate public review this document will be available electronically on both Refuges' websites: www.fws.gov/jbh and www.fws.gov/ridgefield. Hardcopies of the document are also available at the locations listed in section 4.3

Following the 30-day comment period, a final EA will be prepared. Comments received will be incorporated into the final document, as appropriate. Copies of the comments will be available upon request. The decision to prepare either a Finding of No Significant Impact or an Environmental Impact Statement will be made after the final EA is completed.

CHAPTER 2. PROPOSED ALTERNATIVES

In response to the emergency situation and imminent failure of Steamboat Slough dike at the JBH Refuge, the Service considered a range of alternatives.

2.1 Alternatives Considered but Eliminated from Further Analysis

The following alternatives were considered but eliminated from consideration for practical or logistical reasons

Dike Repair—Wahkiakum County Diking District #4 owns the Steamboat Slough Dike, and they currently do not have enough funds or resources to repair the dike. Wahkiakum County, Army Corps of Engineers, Washington Department of Transportation, Congresswoman Herrera Beutler, Senator Murray and Senator Cantwell’s offices and the Refuge have explored numerous possibilities for dike repair, but no solution (with funding) has been found to repair the dike in place. It is estimated that if repairs occur, they will not take place prior to dike failure.

Translocation of Deer to Other Areas—Seven specific areas within the lower Columbia River Valley were considered for translocation efforts. These areas either lacked sufficient secure habitat or were considered too close to major urban centers.

Translocation of Deer to Ridgefield NWR Only—The option of translocating deer to Ridgefield NWR without translocation to Cottonwood was considered. This alternative was not advanced because a recovery effort to move deer to Cottonwood was already planned prior to dike erosion, and the funds needed for the emergency translocation were tied to the Cottonwood effort. Without the Cottonwood portion of the action, the Ridgefield NWR portion could not be undertaken.

2.1.1 Alternatives Considered and Analyzed

The two alternatives analyzed in detail are Alternative A: No Action, and Alternative B: Translocation of animals to Ridgefield NWR and Cottonwood Island. The Service’s preferred alternative is Alternative B.

2.1.1 Alternative A: No Action

Under Alternative A, the No Action Alternative, the Service would not translocate CWTD from the JBH Mainland Unit and Puget Island subpopulations to Ridgefield NWR and Cottonwood Island. The entire Mainland Unit subpopulation would remain on the JBH Refuge and would be subjected to the effects of flooding without mitigation. It is believed that this scenario could lead to the elimination of all but a handful of deer on this unit. In addition, the small population in the Cottonwood Island area would continue to interbreed and be at increased risk of local extinction, inbreeding, and hybridization with black-tailed deer.

2.1.2 Alternative B: Translocation of CWTD to Ridgefield NWR and Cottonwood Island (Preferred Alternative)

Under Alternative B: Translocation, the Service would translocate up to 50 CWTD from the JBH Mainland Unit to Ridgefield NWR and up to 15 CWTD from Puget Island to Cottonwood Island. Translocations would occur from January 15–April 15, 2013. During this timeframe the does are pregnant, which increases the effective translocated population size and reduces the chance that hybridization will occur with black-tailed deer at the release site. In addition, deer moved at this time of year tend to disperse less than those moved in fall (Hawkins and Montgomery 1969, Pais 1987, Jones et al. 1997). The bulk of this translocation effort would occur in 2013, but additional efforts to ensure the survival of the herd could be conducted in future years.

Capture and translocation would occur up to three times per week. Monitoring of the translocated deer would occur three times per week for the first month post release, at least once per week for the next three months, and at least once per month to six months post release. The Service would employ several capture methods. Most of the deer would be moved by ground capture and vehicle transport. Ground capture techniques would include drop netting, drive netting, and darting. Deer would be transported in specially made crates by vehicle and boat. The Service would also conduct one day of helicopter capture after March 1 if ground capture methods have not achieved half of the intended goal by February 22 (capture techniques are more fully discussed in the Effects section for Alternative 2).

In addition to the translocation effort, the Service would implement animal damage management (ADM) for landowners who may incur damage to crops or other property. The plan will implement four levels of management.

- 1) Outreach
- 2) Information and Advice
- 3) Use of Special Equipment
- 4) Trapping and non-lethal removal of problem animals

Outreach

Prior to translocation efforts Ridgefield NWR will meet with interested parties including adjacent landowners, local residents, and elected officials. Efforts will be made to meet directly with the larger landowners and commercial interests, and visits will be made to the properties. Emphasis will be made that black-tailed deer already exist in the area, and white-tailed deer are expected to act in a similar way. The major difference will be that no lethal action will be permitted. Advice will be given on physical deterrents, such as physical fencing, liquid deterrents, and noisemakers. Landowners will be given instructions on how to identify white-tailed deer and black-tailed deer and will be informed that any white-tailed deer complaints should be directed to Animal and Plant Health Inspection Service (APHIS) division of Wildlife Services and not the state agency.

Information and Advice

After outreach has occurred and the deer are moved, damage issues will be handled on a case-by-case basis. When a complaint occurs, APHIS personnel will determine whether a site visit is appropriate. The scenario of the damage issue will be assessed, and through a series of questions and answers it will be determined whether simple deterrence can be implemented. This most often will include the use of physical fencing or liquid deterrents. Several manufacturers of inexpensive plastic deer fence exist, and these businesses will be shared with the client. Information on electrical fencing and liquid deterrents will also be discussed. Other deterrents that may be suggested include the planting of unpalatable or noxious plants, electronic deer repellents, ultrasonic devices, and flagging.

Use of Specialized Equipment

If the information and advice fails to solve the issue, further action may be required. In many cases, the use of specialized equipment such as propane cannons, ultrasonic noisemakers, and electronic deterrents can be implemented.

Capture and Relocation of Problem Animals

In cases where extensive damage occurs, especially commercial damage, and deterrents do not work or are infeasible, it may be necessary to trap and move problem individuals. Deer will be either baited into drop nets or darted and removed from the area to a more remote location.

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Setting of the Proposed Translocation

Physical Setting

JBH Refuge

The primary capture site will be on the JBH Mainland Unit. The JBH Refuge, located in southwestern Washington and northwestern Oregon, was established in 1972 specifically to protect and manage CWTD. The Refuge manages over 5,600 acres of pastures, forested tidal swamps, brushy woodlots, marshes, and sloughs along the Columbia River to benefit wildlife, primarily CWTD.

The JBH Mainland Unit consists of about 2,000 acres of lowland habitat consisting of a mosaic of forest and meadow typified by mixed deciduous vegetation, wetlands, and reed canary grass. About 200 acres are tilled and planted with pasture grasses and forbs on a 4-year rotation. Another 600 acres are under cattle grazing through management with cooperative farmers. Grazing from April through October is used to control reed canary grass and encourage the growth of understory forbs. About 50 acres of pasture are mowed each year during late summer to encourage forb growth, and another 105 acres of ephemeral wetlands are managed through water control structures. The Mainland Unit supports about 70–90 CWTD.

Historically, the Mainland Unit was estuarine habitat with daily inundation caused by back up of the Columbia River during high tides. A dike was built in the early 1900s along the Columbia and Elochoman rivers, and the area was farmed and grazed until the Refuge was established in 1972. The combination of land subsidence and increasing groundwater levels has led to increasingly wet soils and the proliferation of reed canary grass.

Puget Island, Washington

The secondary capture site is Puget Island, WA, which is a roughly 5,000-acre area in the lower Columbia floodplain that consists of Puget and Little Island. Economically, the island is undergoing a transition from agriculture to residential. Agricultural interests mainly include cattle and goat grazing and cottonwood plantations. The area is a mosaic of pastures, woodlots, and several-acre home sites. The island supports about 800 people. The highest density of homes runs along the southern shore with the larger less developed and more vegetated land area toward the center of the island. The Island supports about 170 CWTD.

Ridgefield NWR

The primary release site for the deer is the Carty and Roth units of the Ridgefield NWR. The Ridgefield Refuge is located approximately 67 miles southeast of JBH Refuge in Ridgefield, Washington and is comprised of 5,218 acres of marshes, grasslands and woodlands with about 3,800 acres of terrestrial habitat. A habitat assessment suggests that Ridgefield NWR should support at least 77 CWTD (USFWS 2012²).

Ridgefield NWR is separated into five units (see fig. 4). The Carty and Roth units were selected as release sites because they contain the highest quality white-tailed deer habitat. The Carty Unit supports mixed deciduous habitat with oak savannah comprising a large portion of the unit. The unit contains some areas of dense to sparse reed canary grass, with upland meadows supporting a variety of grasses and forbs. This area also contains large areas of dry soils above the normal flood level. The Roth unit represents more of a parkland mosaic, with dense deciduous tree stands interspersed with upland and wetland meadows. The topography consists of fingers of forested high ground separated by swales. The three remaining units Bachelor Island, River S, and Ridgeport Dairy all contain large areas of low-lying meadow or seasonally-flooded wetlands with pockets of woody cover. Most of the open areas in the River S and Bachelor Island units consist of low-lying meadows and wetlands, which represent poorer habitat for CWTD.

The Ridgefield NWR currently manages water levels on about 1,000 acres of wetlands on the River S, Bachelor Island, and Ridgeport Dairy Unit. Water is pumped in to refuge wetlands prior to the arrival of wintering waterfowl and pumped out throughout the summer to promote the growth of desirable moist soil waterfowl food plants. The water delivery system provides water to wetlands during the winter for a variety of water birds, and is used to hold water in some units for vegetation management, rearing of ducks, wading birds, and to support native amphibians/reptiles.

Cooperating farmers and Ridgefield NWR staff manage approximately 1,500 acres of grasslands and crop to provide for wintering waterfowl. The Refuge allows cooperators to graze cattle and harvest hay between late spring and early fall; and both cooperators and refuge staff mow pasture and reed canary grass. These activities provide forage for Canada geese when they are on the Refuge from October–April.

Areas adjacent to the refuge include agricultural and suburban landscapes around Ridgefield, WA and Sauvie Island, OR. The town of Ridgefield supports a population of about 5,000 people. Radiating from the urban center are residential areas transitioning into semi-rural and rural areas. Sauvie Island consists of about 26,000 acres. The northern half of this island (12,000 acres) is a wildlife conservation area managed by the Oregon Department of Fish and Wildlife (ODFW). The southern half of the island consists of mostly rural landscape with large ownership lots and agricultural interests.

Cottonwood Island, Washington

Cottonwood Island is the secondary release site and consists of about 1000 acres, mainly owned by a coalition of ports, administered by the Port of Portland. The area is largely a dredge material island, with about 500 acres of exposed sand or sand covered by a layer of moss and lichen. Where soil is forming, it is young, with little accumulation of humus. The vegetated area consists of mixed deciduous habitat. The U.S. Army Corps of Engineers recently planted about 50 acres of shrubs for CWTD habitat enhancement, and JBH planted about 16 acres of forage. The Ports allow public access, and the island is a recreational site for camping and fishing. The waters around the island are used for waterfowl hunting. There are no people living on the island and no commercial interests.

Wildlife and Fisheries Resources

All sites involved in the proposed translocation are in the Columbia River floodplain and share similar wildlife species. The JBH Refuge supports over 200 CWTD, including approximately 70–90 CWTD on the Mainland Unit. Another 400 CWTD live on other public and private lands along the Columbia River. Cottonwood Island is the least diverse site because the young, sandy soils support low productivity. Puget Island is the most agricultural and suburban, and therefore supports fewer species than the refuges. The refuges are similar in wildlife resources.

The project areas lie on the Pacific flyway, and large numbers of birds pass through the area during migration. The area provides nesting, wintering, and migratory habitat for all bird guilds. The highest use on refuge lands and Puget Island is wintering waterfowl. Wintering waterfowl populations in the Lower Columbia area reach peaks of more than 200,000 birds, and Ridgefield Refuge in particular was established to provide wintering habitat for waterfowl, especially dusky Canada geese (*Branta canadensis occidentalis*) as well as State-listed sandhill cranes (*Grus canadensis*).

The Columbia River flows along both refuges. In a typical year, over 750,000 adult and 100,000,000 juvenile salmonids pass through the estuary. Both adults and juveniles are present year-round, although the number of juveniles peaks in spring and early summer. There are no salmonid spawning streams within the refuges, but several fish species found in the areas around the sites are listed under ESA and are mentioned in the following section.

While many birds, amphibians, reptiles, and mammals occur at all sites, only a small number of wildlife resources could potentially be affected by the proposed action. Bobcat (*Lynx rufus*) and coyote (*Canis latrans*) occur at all sites. Columbian black-tailed deer (*Odocoileus hemionus columbianus*) occur at Ridgefield NWR and Cottonwood Island. A small herd of Roosevelt elk (*Cervus elaphus roosevelti*) occurs on the JBH Mainland Unit and is managed at less than 25 animals. Cottontail rabbits (*Sylvilagus floridanus*) occur on the Ridgefield NWR.

ESA-listed Species

Nelson's Checkermallow—Nelson's checkermallow (*Sydalcea nelsoniana*) is listed as threatened under ESA. It is a perennial plant typically found in open moist prairies or open Oregon ash woodlands. The species grows up to 5 feet tall, is shade intolerant, and does not persist in areas with a dense canopy of trees or other over-topping vegetation such as reed canary grass or Himalayan blackberry. The dark red-to-purple flowers are spike-like/elongated inflorescences or clusters. Plants have either perfect flowers (male and female) or pistillate flowers (female only). The plant can also reproduce by rhizomes. Flowering typically occurs in June to early July. Seeds are mature between mid-June and mid-September.

In partnership with the Ecological Services Offices in Washington and Oregon as well as the Washington State Natural Heritage Program, nursery plugs were planted in grids in five sites at the Refuge. This species currently occurs at four of those sites (the Kiwa trailhead site does not

support any plants). Three occupied sites are located on the Bachelor Island Unit and one site is located in Texas Island Field in the River S Unit. Threats to this species include herbivory, competition from invasive plants (i.e. Canada thistle and reed canary grass) and changes in groundwater elevations related to the management of the Columbia River flows. Herbivory is most notable at the Texas Island site as it is close to a hedgerow and ash/cottonwood forest used by black-tailed deer and cottontail rabbits.

Water Howellia—Water howellia (*Howellia aquatilis*) is listed as threatened under ESA. It is a winter annual aquatic plant that grows 4-24 inches high in shallow seasonally flooded water bodies associated with oxbows or geological potholes that are typically surrounded by deciduous trees. It has extensively branched, fragile submerged or floating stems and narrow, linear, alternate leaves up to 2 inches in length. Water howellia usually flowers in May and June. Flowers are white to light purple in color, and bloom near the water surface. Seeds are produced in the summer and germinate in the fall when the ponds dry. This species is known to occur in California, Idaho, Montana, and Washington and was present historically in Oregon. In the project impact area, the species occurs in four ponds within the Blackwater Island Research Natural Area in the Carty Unit of the Ridgefield NWR. Threats to this species include unsuitable water level fluctuations which could interfere with seed production or germination, excessive turbidity, and invasive plant species, specifically reed canary grass.

Columbian White-tailed Deer—The CWTD population is comprised of two distinct herds that represent southern and northern fragments of the original range. The southern population occurs near Roseburg, OR in Douglas County. This portion of the herd was once considered endangered but has since recovered to over 6,000 animals and has been delisted. The northern or lower Columbia population is considered a (DPS) and is listed as endangered under ESA (USFWS 1983). The current range of this DPS consists of fragmented habitat within the Columbia River floodplain from Longview, WA to Brownsmead, OR. The DPS exists as a series of subpopulations separated by habitat barriers.

CWTD prefer parkland forest habitat (a mosaic of cover and meadow) and mixed deciduous habitat with moderate cover. As they utilize both browse and forage, they thrive where moderate cover, shrubs, and meadows are present. CWTD do not occur on Ridgefield NWR but are common on JBH Refuge and Puget Island. They also occur in small numbers in the Cottonwood Island area, mostly on the Washington mainland adjacent to the island.

Streaked Horned Lark—The Streaked Horned Lark (STHL) is a proposed threatened species (2012 FR 61938) that nests on islands in the lower Columbia River. These birds nest in sandy areas with sparse vegetation. Most nesting sites in the lower Columbia consist of transitional habitats on dredge material sites. Cottonwood Island appears to contain suitable STHL habitat, and the species occurs on other similar islands in the area. Surveys in 2010, however, failed to document the presence of STHLs on the island, and surveys there have been discontinued. Most of the dredge material areas are relatively new, and they have not developed the vegetation profile preferred by the species. Dredge material areas at the Ridgefield NWR are small (less than four acres) and too heavily vegetated to support STHLs.

Other ESA-listed Species—Three salmonid species have been identified in the sloughs of the Julia Butler Hansen Mainland Unit as well as Campbell Slough at the Ridgefield NWR. These are in order of abundance: Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*Oncorhynchus kisutch*), and chum salmon (*Oncorhynchus keta*). The lower Columbia River populations of these species are listed as threatened. Other listed species that occur in the surrounding area but not in the project areas include bull trout (*Salvelinus confluentus*), green sturgeon (*Acipenser medirostris*), Pacific Eulachon (*Thaleichthys pacificus*), and steelhead (*Oncorhynchus mykiss*). These species occur in the lower Columbia River drainage but do not occur in the project areas.

3.1.1 Effects on Wildlife and Habitat

Alternative A: No Action

A dike breach on the JBH Mainland Unit would lead to nearly daily flooding of most of the Unit and could substantially reduce or possibly eliminate this CWTD subpopulation. Dike failure would likely cause high mortality, reduce reproductive output, and significantly lower or eliminate the number of resident deer. A certain number of deer would probably cross the Columbia River and arrive at Tenasillahe Island where they would become part of that subpopulation. In the other three directions, the JBH Mainland Unit is surrounded by marginal to poor-quality CWTD habitat.

Areas outside the unit are typified by dense coniferous forests that support black-tailed deer. Flooding of the unit would force most of the resident deer into these marginal or unsuitable habitats where they would experience a high degree of competition. In addition to lowered health and productivity, a certain amount of direct and indirect mortality would occur due to vehicle strikes (deer in flooded habitat tend to linger on the raised roadsides), drowning (deer caught in fences and vegetation), and starvation (deer in suboptimal habitat). Prior one-week flooding events have resulted in population drops of 27 percent (2009) and 19 percent (2006) and a reduction in fawn recruitment of 12 percent and 88 percent, respectively. The result of chronic flooding has not been documented but can be expected to be much higher. By comparison, the dike breach at Karlson Island effectively eliminated the small herd there, and other intertidal areas on the lower Columbia support few if any deer.

The Mainland Unit and Tenasillahe Island are the two most important CWTD subpopulations for the lower Columbia DPS. These two subpopulations comprise the only subpopulations that are both secure and stable at over 50 animals. Losing one of these would represent a significant setback in recovery efforts. Recovery goals to delist the species require a total of at least 400 animals with at least 3 subpopulation containing 50 animals each on secured habitat. Losing the mainland subpopulation would return the population back to conditions similar to those in 1972, when only one secure subpopulation existed.

The dike breach would not affect the other project sites, so under the No Action Alternative, no effects would be expected at Ridgefield NWR, Puget Island, or Cottonwood Island. The small population of CWTD near Cottonwood Island would continue to suffer small population effects,

such as potential for inbreeding and hybridization.

Alternative B: Translocation of CWTD to Ridgefield NWR and Cottonwood Island (Preferred Alternative)

Columbian White-tailed Deer—As in the No Action Alternative, dike failure would result in the loss of the JBH Mainland Unit CWTD subpopulation. Dike failure would likely cause high mortality, reduce reproductive output, and significantly lower or eliminate the number of resident CWTD. A certain number of deer would probably cross the Columbia River and arrive at Tenasillahe Island where they would become part of that subpopulation. In the other three directions, the JBH mainland unit is surrounded by marginal to poor-quality white-tailed deer habitat typified by dense coniferous forests that support black-tailed deer. Most deer would be forced into these areas and would likely encounter unsuitable habitat with a high degree of competition. In addition to lowered health and productivity, a certain amount of direct and indirect mortality would occur due to vehicle strikes (deer in flooded habitat tend to linger on the raised roadsides), drowning (deer caught in fences and vegetation), and starvation (deer in suboptimal habitat). Prior one-week flooding events have resulted in population drops of 27 percent (2009) and 19 percent (2006) and a reduction in fawn recruitment of 12 percent and 88 percent, respectively. The result of chronic flooding has not been documented but can be expected to be much higher. By comparison, the dike breach at Karlson Island effectively eliminated the small herd there, and other intertidal areas on the lower Columbia support few if any deer.

Translocation of CWTD is expected to result in an independent subpopulation of deer on the Ridgefield NWR. Translocation, however, can result in deer mortalities. Capture mortality varies by technique, location, and year. White and Bartmann (1994) documented 2-week mortality of 5 and 11 percent for net-gunning and drop-netting, respectively, for mule deer fawns. This can be considered capture-related mortality as opposed to longer term overall mortality. Sullivan et al. (1991) reported a drive-netting mortality rate of 0.9 percent, compared to 23.5 percent for rocket-netting and 16.2 percent for corral trapping. DeYoung (1988) reported a mortality rate for net-gunning of 2.4 percent.

Generally ground capture methods have the advantage of lower mortality and lower expense than helicopter methods. However ground capture requires more time and effort and restricts the areas of capture to only those only accessible by vehicle. This restriction could lead to a lower number of deer captured and the potential for less genetic representation of the new subpopulation. Helicopter capture can access these areas but may lead to higher mortality.

For lower Columbia CWTD captures, ground capture techniques (drop-netting, drive-netting, and darting) have averaged 4.5 percent capture-related mortality for 6 translocations efforts (USFWS 2012³). Helicopter net-gunning has averaged 12.3 percent capture-related mortality for 4 efforts, but two efforts have resulted in a rate of 29.8 percent (17.6 percent for all net-gunning combined). The Service intends to capture 75 percent of the deer with ground capture techniques and 25 percent of the deer with helicopter net-gunning. Assuming 4.5 percent mortality for ground capture and 17.6 percent for net-gunning, a capture mortality of about 6 deer in 65 could

be expected (actual capture-related mortality is expected to be less than this figure because deer will be sedated prior to transport which has not occurred for past efforts). This rate is significantly less than would be encountered if the project did not go forward and a dike failure occurred.

Post-release mortality is less understood. Because translocated deer are given antibiotics and supplements, they often have better survival than resident deer. But that can be offset by mortality resulting from unfamiliar surroundings (e.g., vehicle strikes or poor nutrition). Clark (USFWS 1988) translocated 64 deer from Puget Island in 1986–88 and found no higher mortality than the baseline rate of resident deer (USFWS 2005); however, post-release mortality can vary widely due to deer condition and factors at the release site. Jones and Witham (1990) summarized mortality in 10 deer translocation efforts, showing overall mortality rates (4–16 months) of hunted populations from 25–85 percent. Natural mortality varies widely depending on year and area. Deer in Llano County, TX experienced 4–52 percent natural annual mortality (not including hunting) over 6 years (Teer 1984). Overall mortality for lower Columbia CWTD captures has been less than 25 percent for 8 efforts and 29–49 percent for 4 efforts. Current habitat conditions at the capture site are good, and the deer are expected to be in good physical condition before capture. An assessment of the release site suggests moderate to good habitat quality and a safe distance from major highways (USFWS 2012²). For these reasons the Service anticipates acceptable post-release survival.

For the translocated deer, mortality due to translocation efforts is predicted to be far lower than the expected mortality if the deer were left on JBH. The success of this translocation would maintain the current recovery status of 2 viable and secure subpopulations, which would then occur on Tenasillahe Island and Ridgefield NWR rather than Tenasillahe Island and JBH Mainland.

A small loss in viability would occur in two ways. First, some ability to manage and monitor the population would be lost, as the long history of data collection and management on the JBH Mainland Unit has given the Service confidence of being able to sustain this subpopulation and accurately assess population size. Second, a subpopulation at low risk of hybridization is replaced with one at higher risk. While black-tailed deer populations are low at Ridgefield, they do occur there, representing a small risk of hybridization. From a population perspective, however, this action maintains the status quo for the population in the event of a dike breach.

The effect on Puget Island deer would be negligible. The removal of 15 deer represents less than 10 percent of the population. In the past, up to 30 deer have been removed from this population without an effect on population stability. A release of competition from the removal of deer often leads to a relative increase in resources for the remaining herd. The result is a rapid return to carrying capacity.

Additional deer moved to Cottonwood Island would serve to increase the genetic variability of the deer in that area. Currently less than 10 deer occupy this area, and inbreeding will soon start to occur. Also, the Service hopes to establish a larger presence of CWTD on the island itself, rather than the nearby mainland. The translocation of 15 deer will increase the chances of

maintaining a self-sustaining herd.

Other ESA-listed Species—Water howellia is generally found in seasonally flooded wetlands or water bodies on Ridgefield NWR that provide little suitable forage or cover for CWTD. Black-tailed deer occur in the vicinity and they do not appear to impact water howellia. It is possible that CWTD could cause some injury or mortality by trampling plants while wading through ponds, especially during the flowering and seed-set periods. This impact would likely be localized and uncommon. A short period of time may occur when the pond dries and the plant is still succulent that some grazing may occur. This might occur at very low intensity and would happen after seeding, and it would not be expected to affect the life cycle of the plant.

Browsing on Nelson's checkermallow by black-tailed deer has been observed at the Texas Island site at Ridgefield NWR in 2012. The impacts were largely limited to the flower heads and some trampling. Deer browsing has not been observed at the other reintroduction sites, possibly because they are located in open pastures with little other forage or cover for black-tailed deer. It is possible that CWTD would occasionally browse and trample Nelson's checkermallow at the Texas Island site as the two deer species will likely use similar habitat. Damage to these plants is not expected to increase with the introduction of CWTD; however, as a certain amount of habitat partitioning will occur between CWTD and black-tailed deer, and total deer at the vegetation sites will probably be similar.

Nelson's checkermallow is a perennial plant that will reproduce from both seed and rhizomes. It can survive low levels of deer grazing (Jeff Dillon, USFWS, pers. comm.) and occasional mowing. Grazing and mowing also reduce plant competition with other species, and the Refuge mows the planting sites after the plants have senesced each year. Nelson's checkermallow occurs in many areas with white-tailed deer populations, and overuse by this particular herd is not expected. The Refuge monitors the Nelson's checkermallow sites several times a year and performs annual population censuses. If deer browsing is observed and appears to be impacting the survival of the plants, the Refuge may install fence to exclude deer from the planting sites. Fencing is not currently used to allow for equipment access for annual mowing.

While Cottonwood Island may have some appropriate nesting habitat for Streaked horned larks, no documented sightings have been detected. It is possible that as the dredge material sites undergo succession, the area may attract nesting birds, but at this time the potential for interaction between CWTD and STHL appears to be extremely low to nonexistent. In addition deer will be released in wooded areas well away from STHL nesting habitat. STHL nesting habitat offers little in the way of food or cover for CWTD, and they will be expected to avoid these areas, using them only occasionally to cross from one area to another.

Other Species—CWTD and Columbian black-tailed deer usually have different habitat distributions, but there is overlap. With the absence of CWTD, it is thought that black-tailed deer have increased their numbers in the former CWTD range. Competition between these two species is expected to occur. The habitat at Ridgefield NWR and Cottonwood Island is more appropriate for white-tailed deer. White-tailed deer are less social, however, and may tend to avoid black-tailed deer when present. Both species are expected to coexist for many years,

partitioning habitat. It is hoped that the CWTD will eventually dominate the more open areas with black-tailed deer moving into areas with higher cover.

Coyotes and bobcats prey on deer fawns. The addition of deer into these areas may increase the prey base for both of these species. Coyote and bobcat numbers however, are probably more influenced by small mammal and bird abundance, as this is their prey base for most of the year. In addition, because both of these species are territorial, their numbers are somewhat density dependent.

The elk herd at the JBH Mainland may undergo a release of competition by the removal of deer. This is expected to last only until the dike breaches, however, at which point the area would support few if any elk.

CWTD may represent a small amount of competition with cottontail rabbits for forbs, but this is not expected to have a significant effect on the forage base for this species. In addition the presence of deer may alleviate some predation pressure on cottontails during the fawning season. These effects are not expected to be significant.

Few if any effects are expected on other small mammals, birds, amphibians, and reptiles.

3.2 Archaeological and Cultural Resources

The Ridgefield NWR encompasses 17 known prehistoric sites (this number includes a site on private property on Bachelor Island) and 11 historic sites (USFWS 1997). The most significant sites documented to date are the Wapato portage site and the Cathlapotle Indian Town site (45CL1) in the Refuge's Carty Unit. Aside from the Meier site (35CO5) and the Broken Tops site (35MU57), no extensive excavations of a Chinookan town have occurred below the Columbia Gorge, making Cathlapotle an important source of archaeological information about the region. It is one of the few archaeological sites on the Columbia River that has not been lost to looting, development, or flooding, and may be one of the best preserved native town sites in the northwest United States (Ames et al. 1999).

As Federal property, stewardship of Cathlapotle and other sites on the refuge is mandated and guided by Sections 106 and 110 of the National Historic Preservation Act (NHPA) as well as other relevant Federal cultural resource laws. As part of the stewardship program for the resource, archaeological work began at the site in 1991. A partnership between the Service, Portland State University, and the Chinook Nation soon developed, and by 1995 this partnership—the Cathlapotle Archaeological Program—was formally codified by a memorandum of agreement (MOA). Over the course of six field seasons the remains of six plankhouses, as well as thousands of artifacts, were recovered and catalogued (Ames et al. 1999).

The site occurs in forested riparian habitat of the Carty Unit, 15-20 feet above mean sea level. Covered by stands of cottonwood, willow, alder, and ash trees, with a tangled understory of elderberry and stinging nettle, the site is bounded on the west by Lake River and on the east by Long Meadow. Radiocarbon dates indicate that the town was occupied at its current location

around 1450 A.D. (Lyman and Ames 2004). In comparison to the Meier Site, a larger proportion of European trade items appear to be present at Cathlapotle, suggesting that Cathlapotle was occupied well into the historic period, while the Meier house was not (Ames et al., 1999). Seriation of ceramic trade goods indicates that the Cathlapotle site was abandoned circa 1834 AD (Kaehler 2002).

Archaeologists located 11 house depressions on the surface, laid out in two rows on a ridge running parallel to Lake River. The largest of the house depressions measures 200 feet by 45 feet (10m x 63m), while the smallest is 60 feet by 30 feet. At least four are divided into compartments, as Lewis and Clark described when they visited the town in 1806 (Moulton 1991). Other features described at the site include storage pits, cobble ovens, postholes marking temporary structures such as sheds and drying racks, middens, and debris fields. Although the site was periodically flooded, it was high enough not to be subject to annual flooding, and the archaeological record indicates that it was continuously occupied.

The Wapato Portage site (45CL4) is also an important site, preserving evidence of 2,300 years of continuous occupation. None of the 14 smaller prehistoric sites have been intensively investigated. Evidence from these sites, characterized as fire hearths, habitation sites, or activity stations, suggests that these were temporary or seasonal camps established in the course of fishing, root collecting or processing, hunting, or tool manufacture.

Seven historic basalt quarry sites on the Carty Unit were placed on the National Register of Historic Places in 1981 as the “Basalt Cobblestone Quarries District.” Of the seven only one, 45CL113H, was formally recorded. The other six are grouped together, possibly under the site 45CL161H, but the Service does not have a site record which verifies this. The basalt cobbles from these seven quarries, mined from 1880 to 1903, were used for ship ballast and to pave the streets of Portland, Oregon. The quarries represent not only an important turn-of-the-century industry in Ridgefield, but also a significant step in the development of Portland from a frontier settlement to an urban and commercial center.

Historic sites 45CL112H, 45CL114H, and 45CL285H are old house sites. The 45CL286H site is a refuse dump dating to the late 19th century. Many of these sites have been subjected to looting and amateur excavation. It is very likely that other unrecorded historic (and prehistoric) sites are located on Bachelor Island under the Lake River levee. The island is significant for its early Euro-American settlement, dating to the 1850s (see section 6.2.4 above).

The geographic setting of the Refuge--occupying both islands and mainland along the lower Columbia River--is at the heart of prehistoric and historic travel, hunting, and resource collecting routes. The refuge is situated within the traditional domain of the Cathlamet and Wahkiakum groups of Lower Chinookan Indians. Chinookans had lived on the Columbia River for thousands of years before Euro-American explorers first arrived in the area. Settled 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 the interior. Their strategic control over the lower Columbia made them wealthy and powerful traders.

The Wahkiakum and Cathlamet were active participants in the Euro-American trade network that evolved during the first half of the 1800s. But their numbers dwindled as warfare, liquor, and especially introduced diseases took their toll on all 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.

A thorough cultural resources inventory of the JBH Mainland Unit of the Refuge was conducted in 1981 (Gilbow et. al 1981). It was determined that most historical and pre-historical artifacts, if they exist, are buried several feet deep under sediment. These artifacts may include items such as remnants of native peoples' villages or boats, arrowheads and foundations of settler structures. No other cultural resources studies have been conducted in other areas of the refuge. However, due to the movement of the river over the years, and the fact that the proposed sites are located in a flood plain, it is considered unlikely that any permanent habitations would have occurred in the action areas.

3.2.2 Effects on Archaeological and Cultural Resources

No cultural sites would be affected by either action. Black-tailed deer currently occur on Ridgefield NWR and the presence of white-tailed deer is not expected to change visitation of these sites by wildlife. Deer may occasionally wander through existing sites, but this is not expected to cause disturbance to these sites and is consistent with historical conditions. Any future ground disturbance or excavation that may be associated with the project will be reviewed by the Service's Cultural Resource Branch to protect cultural resources and ensure compliance with all applicable regulations.

3.3 Wildlife-Dependent Recreation

Ridgefield NWR has trails, car routes, and a free roam area. In addition the Refuge supports a waterfowl hunt in fall. The Portland and Vancouver metro areas are within a 15-20 minute drive, and the Refuge receives approximately 120,000 visitors annually.

The JBH Mainland Unit is closed to public use with the exception of a walking trail that is open June 1–September 30. There is a county road (Steamboat Slough Road) that encircles the unit that serves as a car route but is not managed or administered by the Refuge. Steamboat Slough Road has been closed at the erosion site since March 2012 due to the chance of imminent failure of the dike. This road is used by local residents, anglers fishing on the bank of the Columbia River, and refuge visitors. It has also been used as an emergency access route when State Route 4 is flooded.

The Port Authority allows public access to Cottonwood Island. The most common use is shore fishing, camping, and exploring. Waterfowl hunters and fishermen use the channels alongside the island. No deer hunting is allowed. Occasionally, users will transport ATVs to the island.

Puget Island is a mosaic of individual landowners. Waterfowl hunting occurs by landowner permission and there is some use of county and state roads for wildlife viewing.

3.3.2 Effects on Wildlife-Dependent Recreation

The Carty Unit of Ridgefield NWR supports a free-roam area. Under Alternative B: Translocation of Deer, the Carty Unit would be closed during the initial translocation period to allow a settling time for the deer. The time period of release is during the lowest visitation of the year, when much of the Carty Unit is inaccessible and closure during this time is not expected to have an effect on this unit. Depending on post-release distribution of CWTD, free-roam access to the Carty Unit may be closed during early fawning season (June 1–July 15) until the deer population stabilizes (the first 2–3 years). Visitors would still be able to access the trails in this unit, but off-trail use would be prohibited. This is not expected to significantly change visitation, as this area remains wet until July, and most access during this time is on the trails. No changes would be made to allowable recreation at any other site. Under this alternative, a new species would be added to wildlife viewing at Ridgefield NWR. Viewers who are interested in seeing endangered species would be able to include CWTD in their viewing efforts.

Under either alternative, a dike breach at JBH would lead to the loss of the hiking trail, and a change in wildlife viewing opportunities. Part of the road route would still exist, but viewing would be of a mostly inundated landscape rather than a terrestrial wetland, and would favor waterbirds rather than terrestrial birds and mammals. The opportunity to view CWTD at the JBH Mainland would be lost. Under the translocation option the same scenario exists, but the opportunities to view CWTD would be effectively moved to Ridgefield NWR. While the viewing location would change, the overall opportunity to view CWTD on Refuge lands would be maintained.

Wildlife-dependent recreation at Cottonwood Island would not be affected. CWTD currently occur on the island, and the addition of animals is not expected to change the use of this site.

3.4 Social and Economic Environment

The JBH Mainland Unit and Puget Island are in Wahkiakum County, WA near the town of Cathlamet. Wahkiakum County is the smallest county in Washington at 261 mi² and 3,800 people. Cathlamet, with a population of about 600, is the only incorporated town. Managed forests occupy 80 percent of the land. Logging and commercial fishing have traditionally been the mainstays of the economy, but both have declined in recent years. Puget Island is transitioning from a rural to a residential community. Tourism is becoming increasingly important. Much of the tourism is natural resource oriented and the JBH Mainland Unit, which has abundant opportunities for viewing wildlife, is a popular attraction. Visitation to JBH Mainland is estimated to be 50,000 annually.

The nearest community to Ridgefield NWR is the town of Ridgefield, WA, which adjoins the Refuge and has a population of about 5,000 people. The Refuge is located in Clark County, Washington approximately 15 miles north of Vancouver, Washington. Clark County is one of six counties included in the Portland-Vancouver, Oregon-Washington, Metropolitan Statistical Area (MSA).

Clark County is growing rapidly in population, outpacing the nation in terms of both population and economic growth. Most of that growth has occurred in Battle Ground, Camas, Washougal, and Vancouver, but a significant amount has spilled over into Ridgefield. Ridgefield is currently transitioning from a rural to an urban community, and the main economic driver is as a bedroom community for the Vancouver-Portland metro area. Because of this, property values have been rising in recent years, which have caused repercussions for industries such as farming. A significant portion of the area surrounding the refuge, however, still contains rural and agricultural landscapes.

Cottonwood Island is in Cowlitz County WA near the town of Longview/Kelso. Cowlitz County has a population of about 432,000. The Longview/Kelso urban area is the largest urban center in the county at about 47,000. Timber and transportation are important industries in the county. Two ports, the Port of Longview and the Port of Kalama, are termini for ocean-going vessels that ply the Columbia River. Longview and Kelso support several pulp mills and log processing yards. Cottonwood Island is uninhabited and is the site of dredge material composition by the Army Corps of Engineers. The Island is also a recreational site for camping, hunting, and fishing.

3.4.2 Effects on Social and Economic Environment

Alternative A: No Action

The loss of Steamboat Slough Dike would alter visitation of the JBH Refuge, which may affect the number of tourist visits to the surrounding area. Initially visitation may increase because of curiosity, but long-term visitation would be expected to decline. The JBH office would be in the flood plain and would have to be closed, diked, or moved. This would affect interpretation efforts. In addition, as the dike continued to erode, some popular fishing spots would no longer be accessible, and it is expected that as the dike continued to degrade, more of the road would be closed, further reducing accessibility of the area. Whether the county would continue to maintain the existing portion of the road is uncertain. Loss of this road route would reduce access to wildlife viewing, fishing, and other tourist activities.

Alternative B: Translocation of Deer

The effects of a dike breach are the same for either alternative. Alternative B would have few additional effects on the JBH Mainland Unit, Puget Island, and Cottonwood Island. Translocation efforts would be coordinated with private landowners to capture and move problem deer. As such this project may have a slight social benefit for Puget Island in the form of reduced animal damage.

The previous translocation to Cottonwood Island resulted in no animal damage complaints from Longview or Rainier residents. There were several vehicle strikes that went unreported. Deer that stay on Cottonwood Island would result in few social or economic effects. Deer that move from the island to the mainland are in danger of causing vehicle strikes and small amounts of

animal damage to nearby gardens. In the past, most animals have moved to the uninhabited area across from Carol's Channel. As there are no nurseries or agricultural operations in the surrounding area, damage is expected to be minor and we don't expect significant effects to the social and economic environment on Cottonwood Island or the surrounding area.

Some deer that are translocated to the Ridgefield NWR are expected disperse beyond refuge boundaries. Translocated deer often spend the first few weeks exploring before settling into a home range. In addition, as the population grows deer distribution would be expected to expand. At some point deer will probably establish home ranges on private lands surrounding Ridgefield NWR. Prior translocations to Lord and Fisher Islands resulted in ancillary populations in Longview, WA, and Rainier, OR that led to a small number of complaints from private landowners regarding damage to commercial and private property. Most complaints from deer pertain to vegetation damage of gardens, agricultural crops, and nurseries.

Concern has been expressed by the state agencies and Ridgefield NWR that the presence of CWTD in this area could elicit more complaints than have been seen in the past because of the proximity to an urban area and the presence of commercial tree farms in the area. The possibility also exists that the deer will cross the river into Sauvie Island, which contains numerous commercial agricultural businesses.

Historically, black-tailed deer densities in this area are low; however the species is ubiquitous and present throughout the urban and rural landscape of Clark County (Bender et al. 2004). Compared to the larger distribution of black-tailed deer, the translocation of 50 additional deer represents a small portion of deer in the overall environment. Most of these are expected to stay on the refuge, and the ones that leave are not expected to add significantly to the current damage already being caused by black-tailed deer. Animal damage management (ADM) is normally the purview of state agencies; however the endangered status of the CWTD limits the ability of the states to implement lethal control. For this reason, the USFWS proposes to contract with USDA Animal and Plant Health Inspection Service (APHIS) to field animal damage issues.

The hazing and removal of deer may result in a delay in alleviating the problem as compared to issuing a permit for lethal control. In a few cases this delay may lead to increased property damage. Efforts will be made to respond quickly to complaints and in cases where commercial damage is expected, to proceed immediately to capture and removal of deer in conjunction with other hazing techniques. During the course of ADM, a small number of takes may occur through hazing or capture mortality. These activities will be permitted and monitored by the Service.

The ADM plan is designed to minimize the effects of the proposed action on the social and economic environment. The key difference between the presence of CWTD and current situation (presence of black-tailed deer) is that lethal options are not available for CWTD. The ADM plan that would be implemented along with the proposed action would offer an alternative to lethal control and reduce the effects to the social and economic environment.

3.5 Cumulative Impacts

The proposed action, Alternative B, is expected to maintain the recovery status of CWTD at a level that is similar to the current status. The success of a new subpopulation at Ridgefield NWR would eventually lead to a range expansion of CWTD into some off-refuge landscapes. Such expansion represents a return to the historic range, but also may lead to human/animal interaction in areas away from the release sites. Currently black-tailed deer occur in nearly all areas that CWTD may eventually occupy. As CWTD expand, it is expected that a certain level of habitat partitioning will occur, and that black-tailed deer will be replaced in their marginal habitats that are more suited to CWTD. Both species are expected to represent about the same level of human/animal interaction, and as such, there is no expectation of an increased cumulative impact. The significance of this expansion is that while CWTD are still listed as endangered, it is more difficult to control damage issues because lethal options are not available. Lethal control would be replaced with hazing and nonlethal removal.

3.6 Comparison of the Alternatives and Rationale for the Preferred Alternative

Under the No Action Alternative, the Service would not conduct deer translocation efforts. In the likely event of a dike breach on the JBH Mainland Unit, one of the two existing secure and viable CWTD subpopulations would be lost without mitigation. This would represent a significant setback in the recovery of this DPS and a return to similar conditions seen in 1972 when only one viable, secure subpopulation existed. In addition, the small population in the Cottonwood Island area would continue to interbreed and remain at high risk of inbreeding, local extinction, or hybridization with black-tailed deer.

Under Alternative B: Translocation of Deer , the Service would move up to 50 deer from the JBH Mainland Unit before the dike breached and attempt to establish a secure and viable subpopulation at Ridgefield NWR. This would maintain status quo for recovery purposes. In addition, the Service would move a small number of deer to Cottonwood Island, which would help stabilize the small herd there.

In addition Alternative B would contribute to the goals of the National Wildlife Refuge System by strengthening the Service's ability to provide wildlife conservation, contribute to protecting endangered species in the Refuge System, and provide additional opportunities for wildlife viewing.

CHAPTER 4. COORDINATION, CONSULTATION, AND COMPLIANCE

4.1 Agency Coordination and Public Involvement

Coordination on alternatives has been conducted among Washington Department of Fish and Wildlife, Oregon Department of Fish and Wildlife, the Cowlitz Tribe, Ecological Services, Ridgefield NWR, and JBH NWR. Monthly conference calls with all of these agencies have been conducted 9 months prior to this review. Outreach to landowners surrounding Ridgefield will also be conducted. The Refuges have also contacted elected officials at the county and federal levels.

4.2 Environmental Review and Coordination

In conducting a translocation effort, the Service would comply with Federal laws, regulations, and executive orders. The following section describes how the proposed action is in compliance with the National Environmental Policy Act; Endangered Species Act; National Historic Preservation Act; Comprehensive Environmental Response, Compensation, and Liability; and other relevant Federal executive orders.

4.2.1 National Environmental Policy Act

As a Federal agency, the Service must comply with provisions of the 1969 National Environmental Policy Act, as amended (42 U.S.C. 4321-4347). An environmental analysis is required under NEPA to evaluate reasonable alternatives to meet a specified purpose and need for action. An environmental assessment serves as the basis for determining whether implementation of the proposed action would constitute a major Federal action significantly affecting the quality of the human environment. The planning process for developing the environmental assessment facilitates the involvement of government agencies and the public.

In this EA, the Service evaluated two alternatives to meet the Service's purpose and need to maintain the status of CWTD: Alternative A—No Action, and Alternative B—Translocation of Deer. Alternative B would involve the translocation of deer from the JBH Mainland prior to an expected dike failure.

4.2.2 Endangered Species Act

Neither the translocation nor the animal damage management plan represent a Federal action that would affect species listed under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544). The section 7 consultation (USFWS 2012⁴) concluded that the proposed action described in this EA is not likely to adversely affect listed species (Nelson's checkermallow, water howellia, CWTD, STHL) on the JBH and Ridgefield NWRs.

4.2.3 National Historic Preservation Act

The Service would follow established procedures for protecting archaeological and cultural resources if encountered during the translocation process. The Service would avoid damaging

cultural and historic resources and would comply with the National Historic Preservation Act of 1966 (16 U.S.C. 469) and other cultural resource preservation laws, and consult with the State Historic Preservation Office and appropriate Native American tribes for any future restoration and management actions which may have the potential to affect historic properties or cultural resources.

4.2.4 Comprehensive Environmental Response, Compensation, and Liability Act

Under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 U.S.C. 9601 et seq.), the Service determined that the proposed project areas are not on the Environmental Protection Agency's National Priority List or in their CERCLA System.

4.2.5 Executive Order 12372. Intergovernmental Review

Coordination and consultation with affected Tribal, local and State governments, other Federal agencies, and local interested persons has been completed through personal contact by Refuge staff, and Refuge Supervisors.

4.2.6 Executive Order 13186. Responsibilities of Federal Agencies to Protect Migratory Birds.

This Order directs departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act. A provision of the Order directs Federal agencies to consider the impacts of their activities, especially in reference to birds on the Fish and Wildlife Service's list of Birds of Conservation (Management) Concern (BCC). It also directs agencies to incorporate conservation recommendations and objectives in the North American Waterbird Conservation Plan and bird conservation plans developed by Partners in Flight (PIF) into agency planning. The effects of all alternatives to Refuge habitats used by migratory birds were assessed within EA.

4.2.7 Other Federal Executive Orders

In implementing the proposed action, the Service would comply with the following Executive Orders: Protection of Historical, Archaeological, and Scientific Properties (Executive Order 11593); Management and General Public Use of the National Wildlife Refuge System (Executive Order 12996); Departmental Policy on Environmental Justice (Executive Order 3127); and Consultation and Coordination with Indian Tribal Governments (Executive Order 13175).

4.3 Distribution and Availability

A press release will be sent to media outlets near both refuges (in both Washington and Oregon) announcing the availability of the Draft EA.

Copies of the EA are available on both Refuges' websites: www.fws.gov/willapa and www.fws.gov/ridgefield. Hardcopies of the document are also available at the following locations:

Julia Butler Hansen Refuge for the Columbian White-tailed Deer
46 Steamboat Slough Road
Cathlamet, WA 98612
360/795-3915

Willapa National Wildlife Refuge
3888 SR101
Ilwaco, WA 98624
360/484-3482

Ridgefield National Wildlife Refuge
28908 NW Main Avenue
Ridgefield, WA 98642
360/887-4106

Public comments should be sent by January 2, 2013 to:

**Refuge Manager
Willapa National Wildlife Refuge
3888 SR101
Ilwaco, WA 98624**

CHAPTER 5. REFERENCES

- Ames, K.M., C.M. Smith, W.L. Cornett, S.C. Hamilton, E.A. Sobel, S.C. Hamilton, J. Wolf and D. Raetz. 1999. Archaeological Investigations at 45CL1 Cathlapotle (1991–1998), Ridgefield Wildlife Refuge, Clark County, Washington; A Preliminary Report. Cultural Resource Series Number 13. Fish and Wildlife Service, Portland, OR. Wapato Valley Archaeological Project Report #7, Portland State University, Portland, OR.
- Bender, L.C, J.C. Lewis, and D.P. Anderson. 2004. Population ecology of Columbian black-tailed deer in urban Vancouver, Washington. *Northwestern Naturalist*, 85(2):53-59. 2004.
- DeYoung, C.A. 1988. Comparison of net-gun and drive-net capture for white-tailed deer. *Wildl. Soc. Bull.*, 16(3):318-320.
- Gilbow, D., G.W. Lindeman, and H.S. Rice. 1981. Cultural Resources Overview and Intensive Survey of the Columbia White-tailed Deer National Wildlife, Wahkiakum County, WA, and Clatsop County, OR. Eastern Washington University Reports in Archaeology and History, Cheney, WA. Prepared for U.S. Fish and Wildlife Service.
- Hawkins, R.E and G.G. Montgomery. 1969. Movements of translocated deer as determined by telemetry. *J. Wildl. Manage.* 33:196-203.
- Jones J.M and J.H. Witham. 1990. Post-translocation survival and movements of metropolitan white-tailed deer. *Wildl. Soc. Bull.* 18:434-441.
- Jones, M.L, Mathews N.E., and W.F. Porter. 1997. Influence of Social Organization on Dispersal and Survival of Translocated Female White-Tailed Deer. *Wildlife Society Bulletin*, 25:272-278
- Kaehler, G.A. 2002. Patterns in glass: the interpretation of European glass trade beads from two protohistoric sites in the greater Lower Columbia region. Portland State University, Portland, OR.
- Lyman, R.L. and K.M. Ames. 2004. Sampling to redundancy in zooarchaeology: lessons from the Portland Basin, northwestern Oregon and southwestern Washington. *Journal of Ethnobiology* 24(2) 329–346.
- Moulton, G.E., ed. 1991. *The Journals of the Lewis and Clark Expedition*, Vol. 7, March 23 to June 9, 1806. University of Nebraska Press, Lincoln, NB.
- Pais, R.C. 1987. Mortality, dispersal and habitat use of resident and translocated white-tailed deer does on the Cumberland Plateau of eastern Kentucky. M.S. Thesis. Univ. Kentucky,

- Lexington. 82pp. As quoted in Jones et al. 1997.
- Sullivan, J.B., C.A. DeYoung, S.L. Beasom, J.R. Heffelfinger, S.P. Coughlin, and M.W. Hellickson. 1991. Drive-netting deer: incidence of mortality. *Wildl. Soc. Bull.*, 19(4):393-396.
- Teer, J. G. 1984. Lessons from the Llano Basin, Texas. Pages. 261–290. *in* L. K. Halls, editor. *White-tailed deer: ecology and management*. Stackpole Books, Harrisburg, Pennsylvania, USA.
- USFWS. 1983. Revised Columbian white-tailed deer recovery plan. U.S. Fish and Wildlife Service, Olympia, WA.
- USFWS. 1988. Transplanting and herding Columbian white-tailed deer. Report of Activities, Permit CLARA (2/20/87). U.S. Fish and Wildlife Service, Julia Butler Hansen Refuge.
- USFWS. 1997. Summary of Cultural Resources, Ridgefield NWR. Nov 21, 1997. Unpublished report on file at U.S. Fish and Wildlife Service, Sherwood, OR.
- USFWS. 2005. 2005 report of activities permit wnwr-6; establish a second new subpopulation of Columbian white-tailed deer. USFWS report. Julia Butler Hansen Refuge for Columbian White-tailed Deer, Willapa Bay National Wildlife Refuge Complex, Cathlamet, WA. 8 pp.
- USFWS. 2010¹. Lewis and Clark National Wildlife Refuge and Julia Butler Hansen Refuge for the Columbian White-tailed Deer comprehensive conservation plan and environmental impact statement. U.S. Fish and Wildlife Service, Willapa National Wildlife Refuge Complex, Ilwaco, WA. 505 pp.
- USFWS. 2010². Ridgefield National Wildlife Refuge Comprehensive Conservation Plan. U.S. Fish and Wildlife Service, Ridgefield National Wildlife Refuge, Ridgefield, WA. 701 pp.
- USFWS. 2012¹. Columbian white-tailed deer population and fawn recruitment in winter 2011–2012. USFWS report. Julia Butler Hansen Refuge for Columbian White-tailed Deer, Willapa Bay National Wildlife Refuge Complex, Cathlamet, WA. 11 pp.
- USFWS. 2012². Habitat suitability of Ridgefield NWR for Columbian white-tailed deer. USFWS report. Julia Butler Hansen Refuge for Columbian White-tailed Deer, Willapa Bay National Wildlife Refuge Complex, Cathlamet, WA. 4 pp.
- USFWS. 2012³. Report of activities for Columbian white-tailed deer, recovery subpermit WNWR-9 calendar year 2012. USFWS report. Julia Butler Hansen Refuge for Columbian White-tailed Deer, Willapa Bay National Wildlife Refuge Complex, Cathlamet, WA. 9 pp.

USFWS. 2012⁴. Endangered Species Act section 7 consultation for emergency translocation of Columbian white-tailed deer from the Julia Butler Hansen Refuge for Columbian White-tailed Deer to Ridgefield National Wildlife Refuge.

White G.C. and R.M. Bartmann. 1994. Drop nets versus helicopter net guns for capturing mule deer fawns. *Wildl. Soc. Bull.* 22:248-252.