

Habitat Suitability of Ridgefield NWR for Columbian White-tailed Deer

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The possibility of a dike failure on at the Mainland Unit of Julia Butler Hansen National Wildlife Refuge (JBH) could represent a significant setback in efforts to delist the Columbian White-tailed Deer (CWTD). To mitigate these effects, a translocation effort has been proposed to move deer from the affected area to Ridgefield NWR. Although Ridgefield NWR is within the historical range of CWTD and shares many characteristics with JBH, there are distinct differences in habitat that may affect the success of the project. To assess the likelihood of success, a general assessment of habitat was conducted.

Project Area and Methods

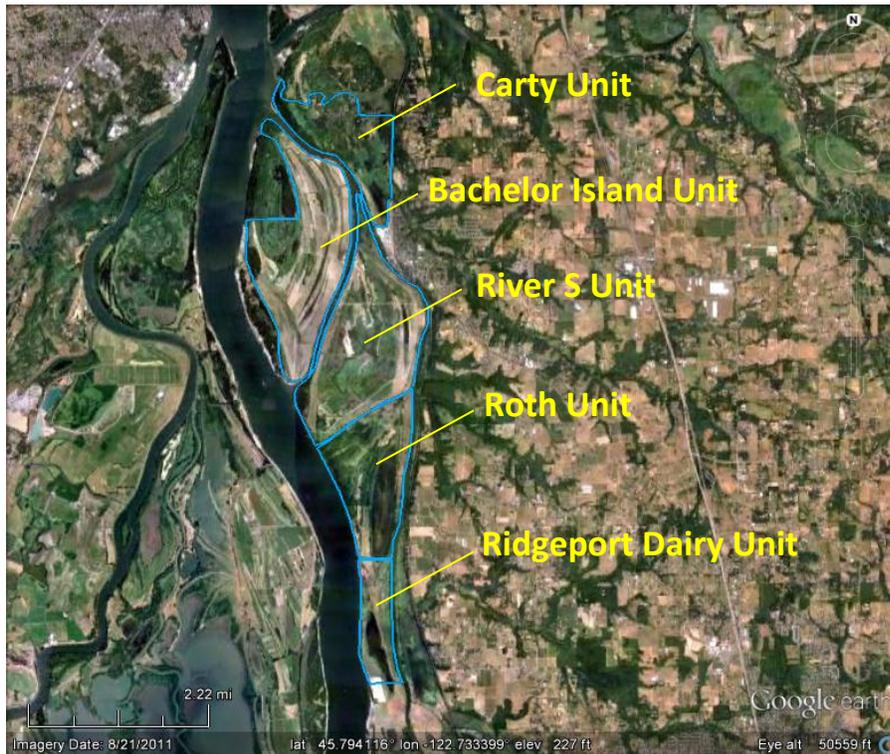
Ridgefield NWR lies within the Columbia River Valley upstream from the current CWTD range (fig. 1). It consists of about 5200 acres of wetland and upland habitat bordered by the Columbia River to the west and private lands to the east.

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



Ridgefield NWR is comprised of 5 main units (fig. 2), each with differing habitat characteristics. These units include Carty, River S, Roth, Ridgeport Dairy, and Bachelor Island.

Figure 2. Ridgefield NWR Units.



We visited these units and evaluated them for cover, browse, and forage. A GIS layer was digitized to approximate the area of each unit, and the Habitat Wetlands Inventory was used as a guide to habitat type. Large areas of the refuge are flooded for much of the year and these areas contribute little to deer habitat throughout the year. For this reason we screen digitized all permanently or semi-permanently flooded and non-vegetated areas and removed them from the total number of available acres.

Habitat was given a qualitative assessment by unit of high, moderate, or low. High quality habitat consisted of mixed deciduous or parkland forest vegetation with an average overall cover of 30–60% with adequate browse and forage. Moderate habitat consisted of areas with 20–30% cover or 60–70% cover with moderate browse and forage. Low quality habitat consisted of open areas or closed canopy forests, or areas with little available food sources.

Results and Discussion

GIS results approximate a total acreage of about 5000 with about 3800 acres of terrestrial habitat (table 1). The Carty Unit contained the highest quality habitat. This area supported a mixed deciduous habitat with interspersed cover, browse, and forage. The understory provided room for movement with a moderate density of browse, including red-osier dogwood (*Cornus sericea*), willow (*Salix spp.*), and snowberry (*Symphoricarpos albus*). Himalayan blackberry (*Rubus armeniacus*) grew in some openings and along the roadway. While dense stands of blackberry can impede movement, it also is one of the most important browse species for deer on JBH and represents an important food source. The area contained some reed canary grass, but it was generally moderate to sparse, with upland meadows supporting a variety of edible grasses and forbs, such as orchard grass (*Dactylis glomerata*), perennial ryegrass (*Lolium perenne*), tall fescue (*Festuca arundinacea*), birdsfoot trefoil (*Lotus corniculatus*), and buttercup (*Ranunculus sp.*). This area also contained large areas of dry soils above the normal flood level. In addition oak savannah comprised a significant portion of the unit. This not only ensures a desirable amount of cover and forage, it should produce a moderate amount of mast during some years. The habitat in this area was probably superior to that seen on the JBH Mainland.

Table 1. Approximate area of terrestrial habitat for CWTD.

Unit	Total Acres	Inundated and Non-vegetated	Net Terrestrial Habitat	Habitat Quality
Carty Unit	730	130	600	High
Roth Unit	900	260	640	Moderate
Ridgeport Dairy Unit	370	130	240	Low–Moderate
River S Unit	1510	460	1050	Low
Bachelor Island Unit	1520	210	1310	Low
Totals	5030	1190	3840	

The Roth unit represented more of a parkland mosaic, with dense deciduous tree stands and open meadows. Within the eastern portion of the unit, there was a high concentration of ash (*Fraxinus spp.*) with a dense understory of dogwood, willow, and snowberry. The western portion of the unit also supported an ash overstory, with an understory dominated by reed canarygrass, which has discouraged tree and shrub regeneration. The topography consisted of fingers of high ground separated by swales. These swales are normally wet during the winter months, supporting reed canarygrass stands during summer and fall.

Overall, the area contained adequate browse and forage, but the high density understory and the high canopy cover in some stands made this area somewhat less desirable than the Carty Unit.

Still the area contained enough openings and mixed deciduous habitat to support a moderate to high density of deer. This habitat was probably equal to or slightly better than that seen on the JBH Mainland.

The three remaining units all contained large areas of low-lying meadow or seasonally-flooded wetlands with pockets of woody cover. In some cases long stringers of trees and shrubs cut through wide open pastures. Most of the open areas in the River S and Bachelor Island units are managed for geese and other waterfowl, which resulted in low-lying meadows and wetlands. While the pastures represented significant forage, CWTD are risk averse and tend to avoid large open areas. We expect these areas to be used when located near available cover, but densities would probably be low and concentrated along the forested habitat.

Deer densities vary widely across their range (McCullough 1984, McNulty et al. 1997) and have been as high as 160 deer per square mile at JBH during severe overcrowded conditions, and as low as 19 deer per square mile in years following weeklong flooding events. The management goal for JBH is 35–40 deer per square mile (USFWS 2010). Because of the high density of reed canary grass and low overall cover at JBH, we consider the Mainland unit to be of moderate quality, and we are currently below this goal. We have conducted significant habitat enhancement, and we expect to reach our goals through pasture renovation and increased cover.

By comparison, the Carty Unit is probably already capable of supporting goals similar to those of JBH without further management. If we ascribe a density of 40 deer per square mile to this unit, it should support about 38 deer. The effect of competition from black-tailed deer on CWTD is unknown, but we have noted more success in areas with low black-tailed deer populations. Black-tailed deer surveys have not been conducted in the Ridgefield area, but the current density of black-tailed deer is thought to be low at the refuge (A. Chmielewski, USFWS, Ridgefield, WA). For the purpose of this exercise, we reduced our expected CWTD numbers by 30% to account for black-tailed deer effects, leaving an expected 27 CWTD in this unit. Similar assumptions assigning the Roth unit an overall density of 30 deer per square mile resulted in an expectation of about 21 CWTD. If the remaining units support even 10 deer per square mile, the rest of the refuge should support about 29 CWTD. This suggests a total expectation of about 77 CWTD.

This is a simplistic estimation that ignores supporting habitat from adjacent lands and inholdings, but it does suggest a minimum number of deer that the refuge could support. The actual number will likely be somewhat higher. The CWTD recovery plan (USFWS 1980) considers a subpopulation of at least 50 animals to be viable and self-supporting. The JBH Mainland population has been estimated at 68–83 animals for the last 4 years, so the estimate for Ridgefield NWR compares well with that number. We consider Ridgefield NWR to be appropriate replacement habitat should the JBH Mainland unit become flooded, and a likely candidate to support a secure, viable subpopulation of CWTD.

References

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