

2003-2012
Post-Delisting Monitoring Report:
Douglas County Distinct Population Segment
of the Columbian White-tailed Deer
(Odocoileus virginianus leucurus)



**Prepared by the U.S. Fish and Wildlife Service, Roseburg Office
in cooperation with Oregon Department of Fish and Wildlife
and Roseburg District Bureau of Land Management
November 2013**

COLUMBIAN WHITE-TAILED DEER POST-DELISTING MONITORING REPORT 2003 - 2012

This Post-delisting Monitoring Report fulfills the requirement in the Post-delisting Monitoring Plan (PDMP) (USFWS 2006) for the Douglas County Distinct Population Segment (DPS) of the Columbian White-tailed Deer (CWTD) by providing annual information on monitoring progress during the Post-delisting Monitoring Period. The current monitoring period concluded at the end of 2012 and the PDMP requires the Service to provide frequent and updated information on the CWTD DPS population parameters such as population trends, disease occurrence and habitat status during the post-delisting monitoring period (for previous reports see:

<http://www.fws.gov/oregonfwo/FieldOffices/Roseburg/>). Much of the information provided in this DPS report relies on the cooperative monitoring efforts by the Oregon Department of Fish and Wildlife (ODFW) and the Roseburg District of the Bureau of Land Management (BLM).

If data from this monitoring effort, or from other sources, indicate that the CWTD DPS is experiencing significant declines (as defined in section 5.1 of PDMP, USFWS 2006) in abundance or distribution, that a potentially catastrophic disease threatens the survival of the population, that substantial habitat has been lost or degraded, or that it requires protective status under the Endangered Species Act for some other reason, the Service can initiate procedures to re-list the population, including, if appropriate, emergency listing. From our current review, we conclude that the CWTD DPS is sufficiently meeting conditions of the PDMP and does not warrant consideration for relisting. However, a major component of the CWTD DPS recovery is having sufficient numbers of CWTD on secured habitat. Based on our review, we have concerns regarding CWTD status and habitat management on these secured areas. While significant steps are being taken to alleviate the concerns, we recommend continued post-delisting monitoring through 2017 to continue to adaptively manage the situation on secured habitat.

In this report, we provide:

- background information on the CWTD listing and delisting (Table 1);
- summary of data covering the post-delisting monitoring period per the monitoring elements of population trend, disease occurrence and habitat status;
- a review the status of the population with respect to the five listing factors considered in Section 4 of the Endangered Species Act; and
- population and habitat monitoring recommendations.

BACKGROUND

Table 1. Timeline of major events in the history of CWTD recovery within western Oregon, 1967 to present.

Year	Action
1967	The species was listed under the Endangered Species Preservation Act of 1966 (USFWS 1967).
1969	The species is included on a list of fish and wildlife species threatened with extinction under the Endangered Species Conservation Act of 1969.
1973	Species automatically included in the Lists of Endangered and Threatened Wildlife when the Endangered Species Act was enacted in 1973.
1976	The first recovery plan for the species was finalized
1978	State of Oregon determined the white-tailed deer in the Roseburg area belonged to the Columbian species.
1983	The revised recovery plan for the species is finalized.
1987	The species is listed as endangered by the state of Oregon with the passage of the Oregon Endangered Species Act in 1987.
1994	BLM acquires "North Bank", which becomes the largest publicly owned secured parcel providing habitat for CWTD and is the linchpin for delisting and recovery.
1995	Oregon Fish and Wildlife Commission voted unanimously to remove the CWTD from the State of Oregon List of Threatened and Endangered Species; the subspecies was placed on the State's Sensitive Species List for continued monitoring. (OFWC 1995)
2001	North Bank Habitat Management Area (NBHMA) Plan finalized
2003	Service delists the Douglas County DPS of the CWTD
2003-10 reports	Post-delisting monitoring recommended

Recovery and Delisting

The CWTD Recovery Plan (1983) identified the following objectives for the Douglas County population: (1) To down-list the population to threatened and recommended the maintenance of 1,000 Columbian white-tailed deer in a viable status on lands within the Umpqua River basin of Douglas County, while keeping the relative proportions of deer habitat within the known range of the subspecies from further deterioration; and (2) to delist the population; it recommended the maintenance of a minimum population of 500 animals from the larger population, to be distributed on 5,500 acres of suitable, secure habitat within the Umpqua River basin of Douglas County on lands owned (public or private), controlled, protected, or otherwise dedicated to the conservation of the species.

The Recovery Plan defined secure habitat as those areas protected from adverse human activities (*e.g.*, heavy, unregulated grazing by domestic animals, clearing of woody plants) in the foreseeable future, and are relatively safe from natural phenomena that would destroy their value to the subspecies (USFWS 1983). Though, more recent information

may suggest that strategic active habitat management may be beneficial to the deer (see below).

POST-DELISING MONITORING PLAN ELEMENTS

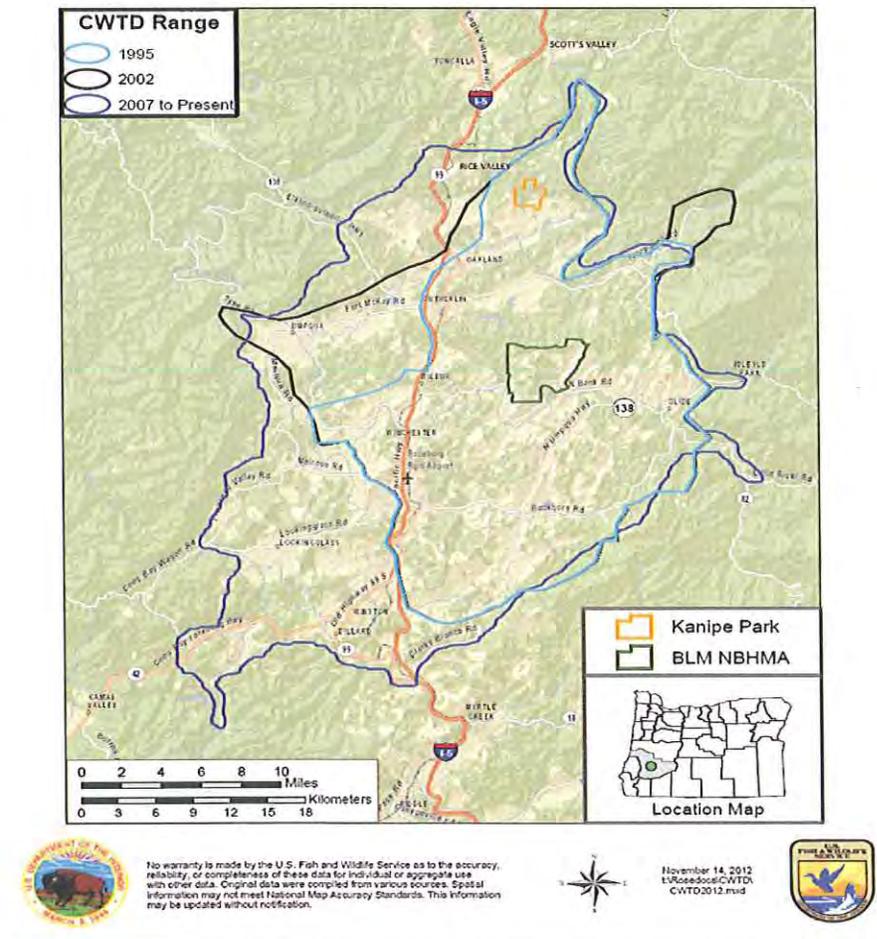
I. POPULATION TRENDS

Range

The range of the Douglas County population of CWTD has steadily been reestablished for the past decade (Figure 1) growing from an estimated 308 square miles in 2002 to almost 550 square miles presently. This growth in distribution is the result of natural movement along with ODFW's transplant program which transplanted over 400 CWTD (Table 2) from occupied habitat into historic but unoccupied habitat.

Some of the deer from this relocation effort have been radio collared to allow for subsequent monitoring. Based on the telemetry information it appears some of the deer have moved north into the southern Willamette Valley near Cottage Grove Reservoir. ODFW is not ready to document a range expansion at this time, but both ODFW and the Service expect to see soon the establishment of resident deer in the southern Willamette Valley due to these past relocation efforts.

Figure 1. Distribution of the Douglas County Population of CWTD, 1995 – 2012.



No warranty is made by the U.S. Fish and Wildlife Service as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.

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Table 2. Data from ODFW's CWTD transplant program 2005 - 2010. No CWTD have been trapped and transplanted since 2010.

Year	Captured	Released ¹	Died	Euthanized	Relocated	
					Bucks	Does
2005	59	3	6	1	18	31
2006	79	3	0	0	32	44
2007	71	5	4	0	33	29
2008	79	5	2	0	39	33
2009	98	3	2	0	30	63
2010	77 ²	0	1	0	33	43
Totals	463	13	12	1	113	168

¹ Released at capture site. ² This includes 7 deer (1 buck and 6 does) that were relocated to Julia Butler Hansen National Wildlife Refuge in Washington State to augment a declining population and was in keeping with the results of a recently completed genetics study showing the Douglas County and Washington populations to be genetically similar (Piaggio and Hopken 2010).

Deer per mile - spotlight survey information

Since 1975, the ODFW has conducted spring and fall spotlight surveys to estimate population size, recruitment, and sex ratios (Table 3). The ODFW has established standard routes along 220 miles of road within the known range of the deer (Figure 2) including 47.5 miles of route through the CWTD core area (Figure 2). In 2013, the ODFW observed 211 CWTD based on the core area route which is estimated to be 4.44 CWTD/core-area mile (Figure 3).

According to the PDMP, it was determined that for core area surveys, a value of less than four deer per mile for five consecutive years would be a threshold at which the trend becomes significantly different than the current trend. The trigger for response will be a population decline to fewer than four deer per mile on core area surveys for 3 consecutive years. According to the data, a sufficient number of deer have been detected annually, above the trigger threshold, that a response by the agencies is not warranted at this time due to this parameter.

Table 3. CWTD population composition compiled by ODFW in management units across Douglas County, 2007 - 2012.

YR	UNIT #	UNIT NAME	2007-2012 CWTD POPULATION COMPOSITION										CLASS TOTAL	BUCKS PER 100 DOES	FAWNS PER 100 DOES	FAWNS PER 100 ADULTS	HAIRLOSS NO. / %
			BUCKS				DOES		FAWNS		TOTAL						
			1	2	3	4	DOES	FAWNS	DOES	FAWNS							
2007	21	INDIGO	0	0	0	0	0	0	0	4	2	6	50.0	50.0	50.0	0/0	
	22	DIXON	2	4	0	1	7	23	3	23	3	33	30.4	13.0	10.0	0/0	
	23	MELROSE	4	18	11	4	37	141	35	141	35	213	26.2	24.8	19.7	1/47	
2008	21	INDIGO	0	1	1	0	2	7	1	7	1	10	28.6	14.3	11.1	0.0	
	22	DIXON	1	0	2	3	6	16	3	16	3	25	37.5	18.8	13.6	0.0	
	23	MELROSE	5	7	14	1	27	167	52	167	52	246	16.2	31.1	26.8	6/2.44	
2009	21	INDIGO	1	2	0	2	5	25	4	25	4	34	20.0	16.0	13.3	0/0.0	
	22	DIXON	0	1	3	2	6	31	5	31	5	42	19.4	16.1	13.5	0/0.0	
	23	MELROSE	3	18	17	5	43	140	41	140	41	224	30.7	29.3	22.4	1/0.5	
2010	21	INDIGO	0	4	5	0	9	21	0	21	0	30	42.9	0.0	0.0	0/0.0	
	22	DIXON	1	0	3	1	5	29	5	29	5	39	17.2	17.2	14.7	0/0.0	
	23	MELROSE	6	14	10	10	40	159	51	159	51	250	25.2	32.1	25.6	0/0.0	
2011	21	INDIGO	0	2	0	0	2	19	4	19	4	25	10.5	21.1	19.0	0/0.0	
	22	DIXON	0	0	0	0	0	0	14	0	14	5	19	0	35.7	0/0.0	
	23	MELROSE	4	16	12	2	34	153	33	153	33	220	22.2	21.6	17.6	1/0.45	
2012	21	INDIGO	0	3	0	0	3	17	5	17	5	25	17.6	29.4	25.0	0/0.0	
	22	DIXON	0	0	1	0	1	17	7	17	7	25	5.9	41.2	38.9	0/0.0	
	23	MELROSE	5	17	11	1	34	127	33	127	33	194	26.8	26.0	20.5	1/0.45	

Figure 2. Core and non-core area survey routes for CWTD within Douglas County, Oregon.

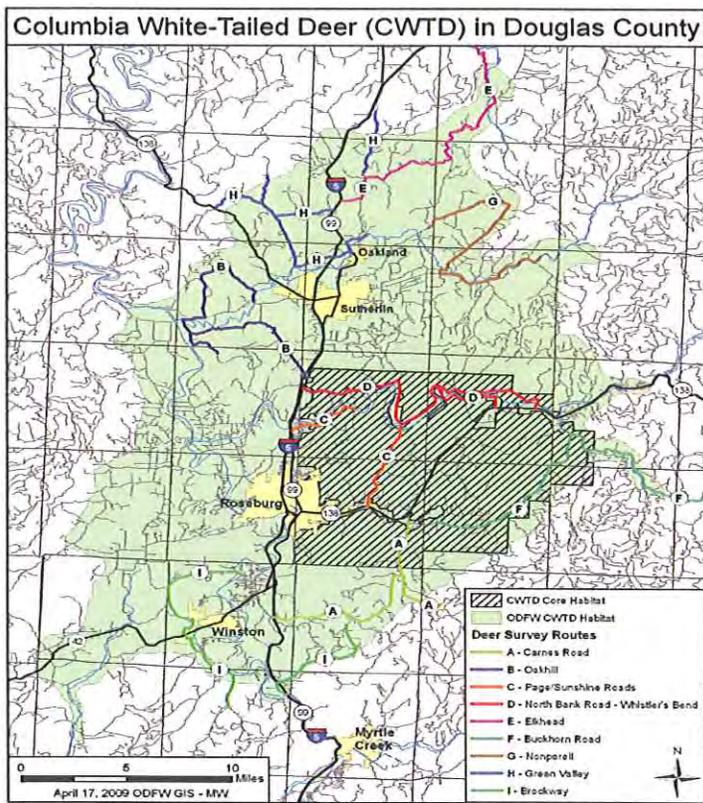
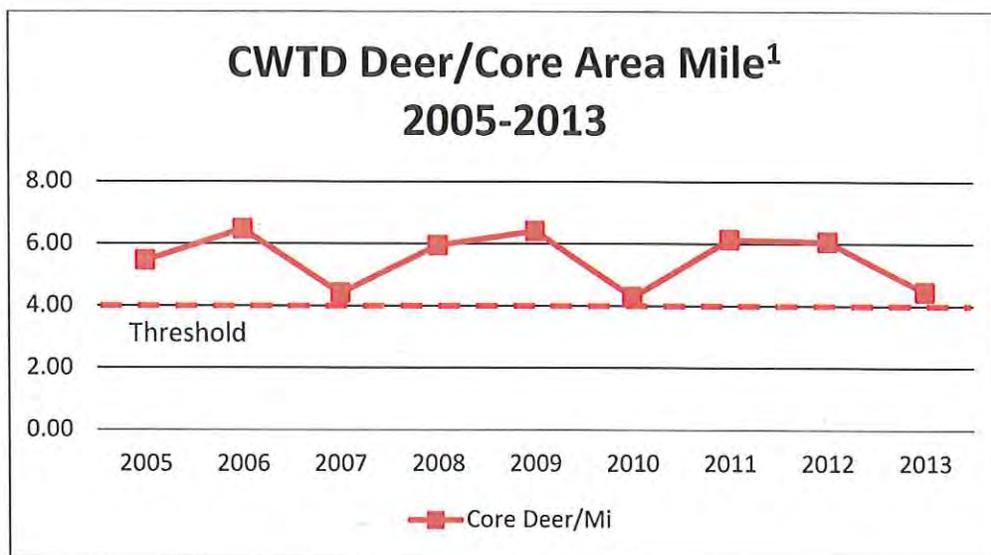


Figure 3. Spring core area count for CWTD within Douglas County, Oregon, 2005 – 2013. ¹ Deer/Mile calculated from the number of CWTD observed on core-area route divided by the core area route of 47.5 miles



Buck and fawn per 100 doe ratios

The buck/doe ratio (bucks per 100 does) in 2012 was 24 (Table 4). Since 1980, buck/doe ratios have held fairly steady and averaged 23.3 with a range of 0 to 57 bucks per 100 does (Figure 4 and ODFW unpublished data). According to ODFW, an average buck ratio of 20 (1 buck per 5 does) is sufficient to provide enough breeding males in the deer population.

The fawn/doe ratio (fawns per 100 does) in 2012 was 23 (Table 4). Since 1980, fawn/doe ratios have generally declined but averaged approximately 32 with a range of 14 to 71 fawns per 100 does (Figure 5 and ODFW unpublished data). CWTD have been protected for many years and only since 2003 have a limited number of bucks been allowed to be harvested. Does however, are still protected from hunter harvest. No kill permits have been issued to landowners with CWTD damage complaints. Instead, ODFW has provided assistance with non-lethal methods and provided advice to minimize damage. Doe mortality comes from road kills, predation, disease and poaching. Fawn survival rates in the area were on the lower end of rates reported for other white-tailed deer populations (Ricca et al. 2002). It is plausible that the low deer - fawn ratios for the Douglas County population may be indicative of an aging doe population where older does are less likely to have fawns. It may also be a function of a competition for food resources along with predation.

Table 4. CWTD buck to doe and fawn to doe ratios computed for Fall surveys compiled by ODFW within Douglas County, Oregon, 1980 - 2012.

Year	CWTD buck/100 does based on fall compositional counts	CWTD fawns/100 does based on fall compositional counts	Year	CWTD buck/100 does based on fall compositional counts	CWTD fawns/100 does based on fall compositional counts
1980	10	57	1997	22	33
1981	57	48	1998	17	20
1982	0	50	1999	32	35
1983	18	30	2000	30	41
1984	24	47	2001	22	34
1985	16	71	2002	24	34
1986	22	49	2003	22	25
1987	31	42	2004	22	23
1988	19	31	2005	20	14
1989	21	31	2006	20	20
1990	28	36	2007	26	24
1991	30	36	2008	18	29
1992	29	35	2009	28	26
1993	29	44	2010	26	27
1994	26	45	2011	19	23
1995	21	44	2012	24	23
1996	22	23			
1998	17	20			

Figure 4. Composition of bucks to does for CWTD during Fall surveys within Douglas County, Oregon, 1980 – 2012. Data from ODFW.

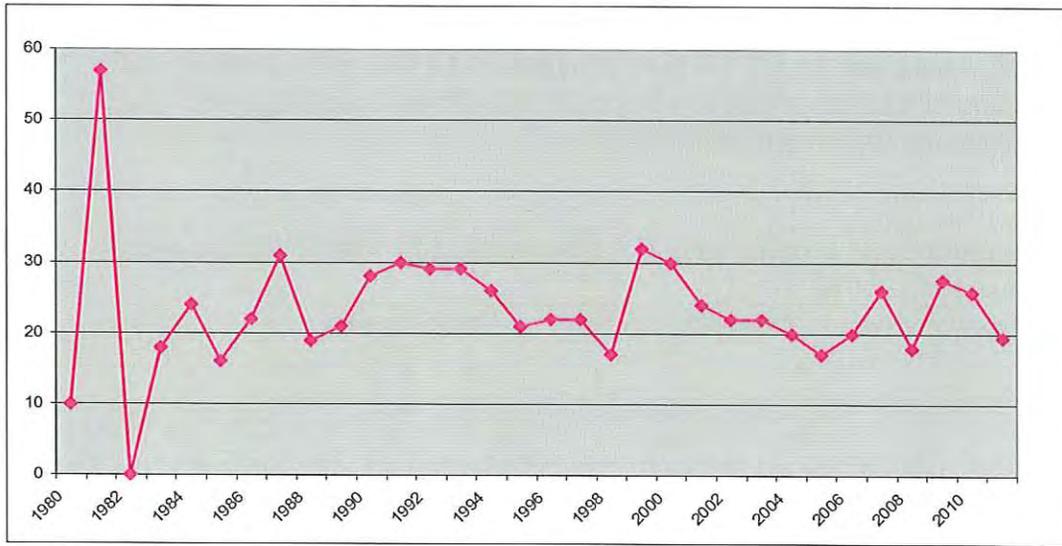
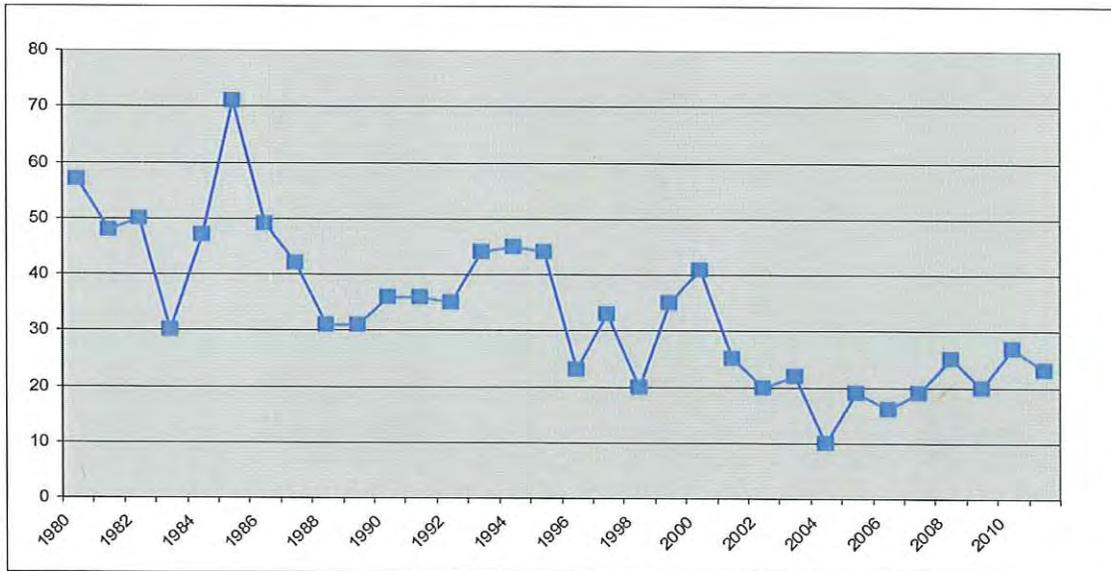


Figure 5. Composition of fawns to 100 does for CWTD during Fall surveys within Douglas County, Oregon, 1980 – 2012. Data from ODFW.



Annual population estimates

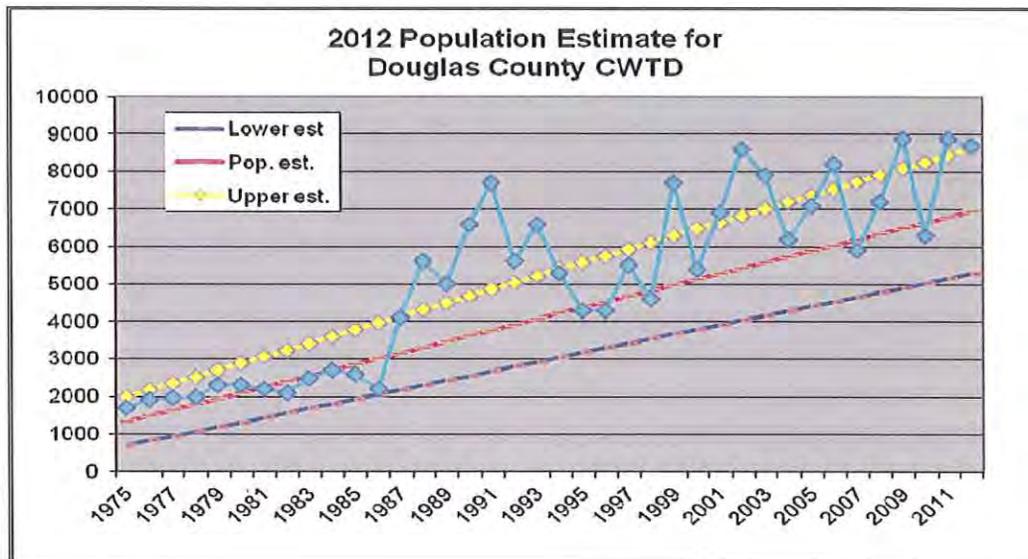
Douglas County

Annual population estimates for CWTD have demonstrated a long-term upward trend since management for the deer population began in 1975 (Table 5 and Figure 6). The population estimate for 2012 was 6,956 CWTD.

Table 5. Population trend estimates for CWTD compiled by ODFW for Douglas County, Oregon, 1975 - 2012.

Year	Lower Estimate	Population Estimate	Upper Estimate
1975	615	1317	2018
1976	738	1472	2206
1977	860	1628	2395
1978	982	1783	2584
1979	1105	1939	2773
1980	1227	2094	2962
1981	1349	2250	3151
1982	1471	2406	3340
1983	1594	2561	3529
1984	1716	2717	3717
1985	1838	2872	3906
1986	1961	3028	4095
1987	2083	3183	4284
1988	2205	3339	4473
1989	2328	3495	4662
1990	2450	3650	4851
1991	2572	3806	5039
1992	2694	3961	5228
1993	2817	4117	5417
1994	2939	4272	5606
1995	3061	4428	5795
1996	3184	4584	5984
1997	3306	4739	6173
1998	3428	4895	6361
1999	3550	5050	6550
2000	3673	5206	6739
2001	3795	5361	6928
2002	3917	5517	7117
2003	4040	5673	7306
2004	4162	5828	7495
2005	4284	5984	7683
2006	4406	6139	7872
2007	4529	6295	8061
2008	4651	6450	8250
2009	4951	6568	8483
2010	4812	6570	8329
2011	5073	6793	8513
2012	5283	6956	8628

Figure 6. Population trend estimate for CWTD, as calculated by ODFW, for Douglas County, Oregon, 1975 - 2012. Blue line with diamond symbols represents the annual estimate.



CWTD on Secure Habitat

The 6,500 acre NBHMA managed by the BLM, is considered as secure habitat for the CTWD. It is located within the core habitat area (Figure 2) and up to 17 miles of survey routes within the NBHMA were established beginning in 2007 for pre-hunting season census surveys.

Overall, the CWTD population at the NBHMA seems to be relatively stationary but may be in decline (Figures 7 and 8). Additionally, survey results for NBHMA are generally lower than the ODFW standard core routes (Figure 9). A disparity in the numbers could be due a number of factors at the NBHMA. For example, a proportion of the survey routes occur on the high ridges, well away from water in the late summer and lower in habitat quality in contrast to the valley bottoms which are relatively higher in habitat quality and less accessible for survey; the site-survey distance is somewhat limited on the routes compared to the more open conditions along the County road routes; and, timing of prescribed burns that occur during the summer could affect CWTD distribution in the short-term.

The ODFW estimated deer occurrence on the NBHMA ranged from 154 to 348 individuals during 1994 through 1997 (Steve Denney, pers. comm. 1997). According to the more recent raw counts, the number of CWTD per the survey routes on the NBHMA has ranged from a high of 344 in 2008 to a low 260 in 2012 (Figure 8). These numbers should be viewed as minimums for the population size at the NBHMA. This is due to surveys being conducted during a time of year when the deer are less active and therefore less visible. Also, the raw count is restricted to the road system; it is likely that more deer

occur at the NBHMA than just those counted via the road network; but, how many more is unknown.

Figure 7. North Bank Habitat Management Area CWTD survey results (August and September combined) as compiled by BLM, 2007 - 2012. CWTD = Columbian white-tailed deer and CBTD = Columbian black-tailed deer.

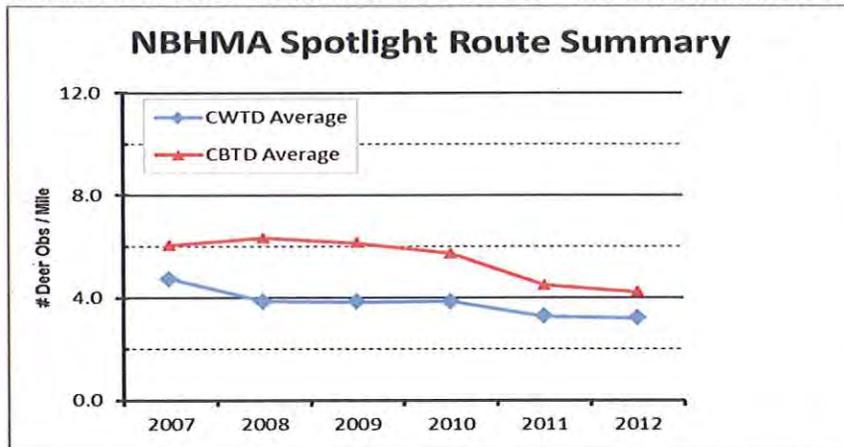


Figure 8. Raw counts of CWTD during spotlight surveys on the NBHMA, compiled by the BLM, 2007 - 2012.

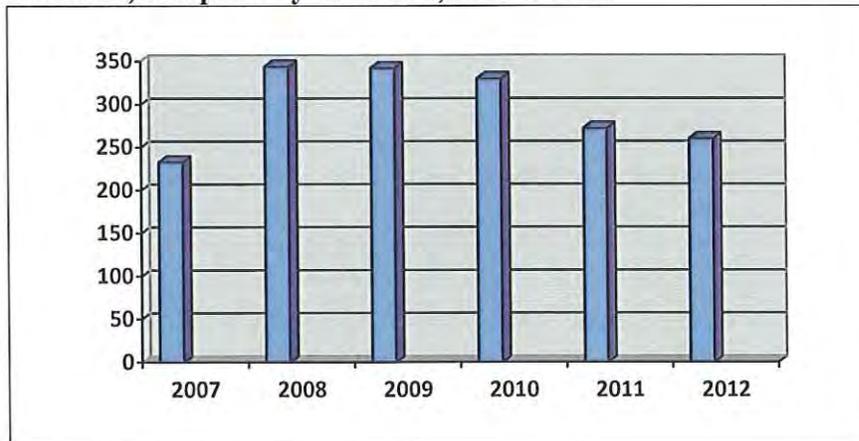
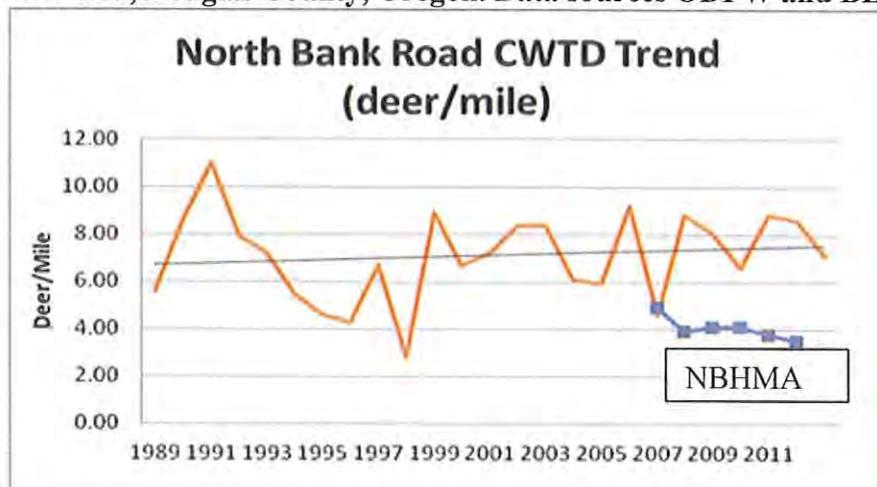


Figure 9. Results of CWTD surveys along North Bank Road and within the NBHMA, Douglas County, Oregon. Data sources ODFW and BLM, 1989 - 2012.



Mildred Kanipe Memorial Park (1,100 acres) and Whistler’s Ben County Park (175 acres) and a private landowner conservation easement of 202 acres, are also considered as secure habitat. Unfortunately, no current surveys are available to estimate CWTD numbers on these parcels. Though, in 2001, ODFW estimated that there were approximately 100 CWTD at Whistler’s Bend Park.

For the population to be delisted in 2003, it was recommended that a minimum of 500 animals from the larger population be distributed on 5,500 acres of secure habitat within the Umpqua River Basin of Douglas County. For 2012, best available data along with reasoned estimates and professional opinion suggest that a minimum, at least 250 CWTD reside on the approximately 6,500 acres of secured habitat at the NBHMA. Because of lack of surveys on the remaining 1,500 acres of secured habitat, it is unclear how many deer reside in these areas.

Population Trend Summary

The CWTD population has nearly doubled its range within Douglas County over the past decade. The number of deer per mile within the core area remains strong and above the PDMP’s response trigger. The population composition as expressed through the average buck ratio seems to be sufficient enough for the breeding population. However, fawn survival and recruitment are low for reasons unknown and may be the result of density-dependent factors including an overall high density of deer, lack of carry capacity, or availability of quality forage. In the 1930s, the Columbian white-tailed deer population in Douglas County was estimated at fewer than 300 individuals within a range of about 31 square miles (Crews 1939). More recent data through 2012, indicate a continued, strong, increase in the number of deer to approximately 6,000 individuals covering almost 600 square miles, exceeding the downlisting criteria of 1,000 individuals. While some data is lacking, our best available population and demographic estimates indicate CWTD are at or

above the original delisting triggers for the DPS. However, there are concerns regarding the species population status on secure habitat and secured habitat was identified as crucial to continued recovery of the species.

II. DISEASE OCCURRENCE AND OUTBREAK EARLY ALERT SYSTEM

In the final rule to delist the CWTD Douglas County DPS, the Service noted that disease outbreaks could threaten the health of the deer population. Therefore, three diseases are monitored as part of the ongoing post-delisting monitoring program, two diseases (adenovirus hemorrhagic disease and deer hair-loss syndrome) are endemic in the population, and are monitored as part of ODFW's standard disease monitoring efforts.

Adenovirus hemorrhagic disease

Sampling by ODFW has found adenovirus titers (evidence of past exposure) are present throughout the CWTD DPS. ODFW considers this disease to be present in the herd at low levels (endemic) and currently poses no real concern (Tod Lum, pers. comm. 2012).

Deer hair loss syndrome

Deer with hair-loss syndrome are noted by ODFW on the twice annual population surveys (see Table 3 above) and is not currently considered to be a threat to the population. In 2007, 0.4 percent (1 occurrence in 254 deer) of the deer population had this syndrome whereas in the more recent years, the prevalence of hair loss has been minor (Table 3).

Chronic wasting disease

Documenting the continued absence of chronic wasting disease in Oregon is a priority for ODFW. Samples are collected from hunter-harvested elk (*Cervus elaphus*), black-tailed and white-tailed deer. This disease has not been detected anywhere in Oregon to date (Tod Lum, pers. comm. 2012) and it will continued to be monitored because should it ever be detected, the disease could pose a significant threat to the deer.

Disease Occurrence Summary

Current data show no evidence of increased mortality due to adenovirus hemorrhagic disease or deer hair loss syndrome. These diseases are present in the population at low levels, but at this time do not show evidence of becoming more prevalent. Chronic wasting disease has not been detected in Oregon, and therefore is not currently a threat to the deer. If diseases are detected, the agencies will work with the State Wildlife Veterinarian to apply the necessary treatment to the population, which could include manipulating herd density or removing infected individuals. A major disease could be cause to extend population monitoring to document recovery from the outbreak.

III. HABITAT STATUS

The Recovery Team recognized conversion of habitat to rural residential home-sites and intensive livestock grazing as the prime threats to Columbian white-tailed deer habitat in Douglas County (USFWS 1983). The collaborative efforts of the Service, ODFW, BLM,

Douglas County, and others to recover the population, have focused on protecting and restoring important habitats for the CWTD. Since 1978, over 7,000 acres have come into public ownership within the CWTD DPS's range. This acreage includes the BLM's NBHMA and Douglas County's Mildred Kanipe Memorial Park. In addition, a number of Federal, State and local programs have assisted private landowners in Douglas County who wish to protect or restore the natural habitat values on their lands. Since 2004, over 100 landowners protected or enhanced approximately 5,000 acres of habitat under these programs (combined sources of SWCD, NRCS, Douglas County and others through 2012). Continued management and protection of key habitats is essential to the long-term maintenance of the population.

In addition to monitoring the population trend and establishing an early warning system for disease outbreaks, monitoring the status of habitat managed for the CWTD DPS is also relevant to tracking the status of the population. Protection and active management of riparian habitats and open space in Douglas County have allowed the population to recover; monitoring the status of those parcels will help us evaluate whether the population will again be threatened by habitat loss. Potential environmental impacts of major Federal and non-Federal projects, when known, are reviewed by either the Service or ODFW for CWTD concerns. Where possible, the agencies will use their various authorities to encourage adjustments to the projects benefitting CWTD. If the annual habitat status review indicates that the range of the CWTD is contracting due to loss or degradation of habitat, then the Service and ODFW will take actions to help ensure that continued habitat loss does not threaten the population with decline toward a listing status.

Development and Habitat Management within Douglas County

Douglas County implemented land-use plans and zoning ordinances that apply to private lands to protect habitat and assist in CWTD recovery (Douglas County Planning Department [DCPD]) 1995); Douglas County Board of Commissioners 2002). These protective measures include retention of existing land uses that maintain essential habitat components. Minimum lot sizes for farm use and timberlands, as well as building setbacks along riparian zones, have been established to ensure maintenance of habitat and travel corridors (ODFW 1995; Douglas County Board of Commissioners 2002). Douglas County's Columbian White-tailed Deer Habitat Protection Program was established in 1980 (Douglas County Board of Commissioners 2002). The County, in conjunction with the ODFW and the Service, identified the range of habitat with the greatest density of Columbian white-tailed deer, and 73,495 acres were designated as Essential Habitat Areas (DCPD 1995). Potential conflicting uses within the Essential Habitat Areas were identified as: (1) Residential development in native riparian habitat; (2) additional livestock development in lowland river valleys; and (3) brush clearing, aimed at creating and improving pastures for livestock, that removes cover for deer (Douglas County Board of Commissioners 2002). To address these concerns, 96.5 percent (70,555 acres) of the resource lands (agricultural or farm/forest) within the Essential Habitat Area are subject to a minimum parcel size of 80 acres; and any land division requests of less than 75 acres must be reviewed by the ODFW (Douglas County Board of Commissioners 2002). Land zoned as non-resource lands within the Essential Habitat Area (3.5 percent) is limited to single family dwellings, and rural residential development is limited to 2-acre and 5-acre lots (DCPD 1995; Douglas County Board of Commissioners 2002).

Another component of Douglas County's program (2002) to conserve habitat for the subspecies was a 100-foot structural development setback from streams to preserve riparian corridors within the Essential Habitat Area (Douglas County Board of Commissioners 2002). However, a rule change a few years thereafter, changed the setback distance to 50-foot in the entire county from a riparian area for building a structure and vegetation removal can still occur down to the creek or river in limited hardship cases. Additionally, other rule changes may be forthcoming through the Southern Oregon Regional Pilot Program for Regional Farm and Forest Conservation for Douglas, Jackson and Josephine Counties. ODFW will continue to provide recommendations when appropriate and available, to minimize development impacts to CWTD habitat.

In 2006 there was an estimated 197,000 acres of suitable deer habitat in Douglas County. Subsequently, residential development within the City of Sutherlin, annexations and additions to both Sutherlin and the Roseburg Urban Growth Boundaries have occurred, approximating 1,765 acres (acre summary from previous monitoring reports). A relatively small portion of this development, less than 1 percent, affected deer habitat in the county. This level of development should not affect the overall deer population. The deer continue to be present in the city limits and should continue to be present in the future, but deer carrying capacity will likely be reduced.

Management Actions within Private lands

Habitat conservation and restoration projects on private lands have direct and indirect benefits to deer. Riparian protection (such as fences and off-stream watering facilities) along with actions such as native plantings, grass seeding and conversion of orchards and pasture back to native riparian vegetation provide deer with valuable fawning and/or hiding cover and thermal refugia during the hot summer months.

Over the years, these projects have been funded and implemented by suite of groups and organizations and programs. Example organizations include: Oregon Watershed Enhancement Board (OWEB), Partners for Fish and Wildlife, Jobs-in-the-Woods, The Nature Conservancy, McKenzie River Trust, Natural Resources Conservation Service (NRCS), Douglas Soil and Water Conservation District (DSWCD), and Partnership for the Umpqua Rivers (Watershed Council), to name a few. Program delivery has occurred through federal efforts such as the Environmental Quality Incentives Program (EQUIP), the Conservation Reserve Program (CRP), Continuous Conservation Reserve Program (CCRP) and Conservation Reserve Enhancement Program (CREP). These projects, because of the deer's affinity for riparian habitat, have contributed and will continue to assist in the restoration of deer throughout their historic range. Since 2006, approximately 8,500 acres have had conservation practices benefitting CWTD in Douglas County (data based on past reports and more recent NRCS information through 2012). While it is somewhat difficult to track project implementation on an annual basis, available data indicates that the amount of private land acres enrolled in programs is holding steady, if not increasing the past few years.

Management Actions within Secure Habitat Areas

Mildred Kanipe Memorial Park:

Mildred Kanipe Memorial Park (1,100 acres) (Figure 1) is the second largest parcel of publicly owned land within the CWTD DPS's range. The park is managed by the Douglas County Park Department who is revising a Coordinated Resource Management Plan with habitat recommendations. Recent beneficial habitat projects in the park have included over 100 acres of oak savanna and oak woodland restoration. Treatments targeting non-native and invasive species (English hawthorn, Himalayan blackberry and Scotch broom) through cutting, spraying and burning have occurred along with reseeding treated areas with native understory species. Continued vegetation succession and increases in invasive weeds threaten and diminish CWTD habitat quality in the park. Restoration efforts that balance the management direction for the park and benefit CWTD should be compatible.

Whistler's Bend County Park:

Whistler's Bend County Park (175 acres) is directly south of the NBHMA, across the North Umpqua River. The park is managed for human recreation needs (Douglas County Parks Department 1999), but also provides hiding cover for deer, which make forays onto adjacent private lands to forage in the pastures and suburban yards surrounding the park. At this time, deer habitat management has not been established for the park and small parcels such as this park function as important refugia for deer that meet many of their foraging requirements on adjacent private lands (Recovery Team, *in litt.* 2001).

North Bank Habitat Management Area:

The NBHMA (6,500 acres) is located east of Roseburg in the North Umpqua River basin (Figures 1 and 2) and is the largest publicly owned parcel providing habitat for deer. The NBHMA was previously managed as a working cattle ranch and was acquired by the BLM in 1994 through a land exchange (BLM 1998) specifically to secure habitat for the deer since it lies within the Douglas County core habitat. It is characterized by four distinct habitat types: Grasslands and oak savannah (29 percent); hardwood/conifer forest (52 percent); oak woodlands (17 percent); and other habitat such as rock outcrops, riparian areas, and wetlands (2 percent) (BLM 1998). No active habitat management occurred at the NBHMA in the period between its acquisition in 1994 and the completion of a management plan in 2001; and this lack of management has resulted in a decline in habitat quality (BLM 2000) due to a buildup of thatch (rank vegetation) in grassland areas, invasion of undesirable shrub species, cedar encroachment in meadow areas, and conifer seedling establishment in oak woodlands, inhibiting forb production for deer forage and by reducing the availability of preferred cover (BLM 1998). Today, aggressive active management to benefit CWTD is a challenge and discussed below.

The primary goal of the NBHMA Habitat Management Plan (HMP) is to ensure habitat for the CWTD, which is why the parcel was originally purchased. Management objectives identified in the final HMP include: (1) increased availability, palatability, and nutritional quality of deer forage and browse; (2) maintenance of mature oak, shrub, and herbaceous vegetation components; (3) control of noxious weeds; and (4) development of water sources (BLM 2001). Prescribed burning, thinning thick conifer stands, timber management, seeding and planting, and livestock grazing are some of the management tools available to achieve these objectives (BLM 2001). These activities will be scheduled

to avoid sensitive periods (such as fawning and nursing) for the deer (USFWS 2001). Prescribed burning and seeding will be used to increase the abundance of desirable forage plants; thinning of oaks and removal of encroaching conifers will provide more preferred open canopy hiding cover for the deer (BLM 2001; USFWS 2001).

General management actions have been implemented before and since de-listing of the deer (from 2001-2012) to restore stream, riparian and upland habitat. These management actions include prescribed burning (Figure 10), seeding, forage plot development, noxious weed treatment, mowing, planting, and installation of water developments (guzzlers) (Table 6). Extensive work has been accomplished on stream headcuts and crossings along with associated road improvements to improve stream and riparian habitat (Figure 11). More recently, a pilot program utilizing livestock for grazing (Figure 12) in the Blacktail basin has been utilized. Under the close coordination of BLM resource professionals and a local rancher, livestock are being used to reduce the thatch overburden and improve the quality of the forage for CWTD. Many aspects of the pilot program are being monitored (e.g., forage condition, water quality, thatch removal) (Figure 13) by the BLM for implementation and effectiveness success and to ascertain more broad scale application of grazing across the parcel.

NBHMA Monitoring

The following monitoring efforts are occurring within the NBHMA:

- Stream and riparian with the establishment of baseline stream channel and greenline surveys. Greenline surveys are designed to measure vegetation trends on streambanks and rely upon identification of riparian plant community types on a line intercept transect (Cagney 1993).
- Vegetation condition with the establishment of permanent photo plots and transects within different habitat types. Plots and transects have been and will be re-visited as various management actions have taken place across the area.
- With the assistance of ODFW, BLM established and surveyed deer census spotlight routes within the NBHMA in 2007. The initial routes totaled 11 miles in length with expansion to 17 miles in 2008. Surveys are conducted twice, in late August and early September, prior to hunting season.
- CWTD studies on habitat use, survival and forage plot use using ear tags, radio and GPS collars.
- Noxious weed control
- Water quality monitoring
- Recreation user counts

Table 6. North Bank Habitat Management Area management activities benefiting Columbian white-tailed deer, 2001 - 2012 (source Roseburg BLM).

Management Activity	Units	Pre-2001[i]	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Totals
Prescribed Burning	Acres	Some	490	586	640	730	570	634	32	250	480	152	218	58	4840
Post-burn Seeding-Hand or ATV	Acres	None	0	0	5	50	0	0	10	5	0	0	35	0	106
Post-burn Seeding-Aerial	Acres	Some	0	0	0	0	400	450	0	0	160	0	0	0	4010
Post-burn Seeding-Fire Trails	Miles	None	10	10	10	10	10	0	0	0	0	0.5	0	1	61.6
Forage Plots Installed, Non-native	Acres	None	0	0	0	0	17	15	0	51	12	15	2	0	112
Forage Plots Installed, Native	Acres	None	0	0	0	0	0	0	0	41	8	3	0	0	52
Forage Plots Maintained[iii]	Acres	None	0	0	0	0	0	0	0	0	114	70	159	30	373
Water Developments	Each	None	1	3	1	1	1	3	0	0	0	0	1	0	10
Weed Treatment, Upland	Acres	None	0	64	70	112	30	10	30	24	138	225	150	150	853
Weed Treatment, Streamside	Miles	None	0	1	1.3	1.5	2	15	3	5	2	5	1	0	43.8
Upland Planting[iv]	Acres	Some	0	15	25	15	0	3	3	5	5	2	1	0	71
Streamside Planting	Miles	Some	0	0	1	1.3	0.3	2	1	6	3	3	1	0.5	19.1
Mowing	Acres	Some	45	30	45	45	30	30	30	62	70	70	138	50	646
Oak Thinning	Acres	None	0	0	0	0	0	0	0	30	45	15	0	0	90
Grazing to Improve Forage	Acres	None	0	0	0	0	0	0	0	0	0	0	58	285	343
Stream Restoration[v]	Miles	None	0	0	0	0	0	0	0	1	2	1	1	0.5	6.6
Head Cut Stabilization	Each	None	0	4	3	0	0	2	0	0	0	0	0	0	9
Road Maintenance	Miles	None	0	2	2	2	0	0	3.3	0	0	0	3.5	5.5	16.3
Culvert Maint./Replacement	Each	None	0	0	0	0	0	0	7	0	0	1	2	2	12
Armored Stream Crossings	Each	None	0	0	0	0	0	0	0	0	0	0	0	0	1
Interior Fence Removal	Miles	Some	0	0	0	0	0	0	0	0	0	1	0	0	1
Stream Surveys	Each	None	0	0	0	8	0	0	0	0	0	0	0	0	11
Permanent Vegetation transects	Each	None	0	0	11	12	10	4	0	7	9	5	3	0	61
Spotlight routes	Miles	None	0	0	0	0	0	0	22	34	34	34	34	34	192
Forward-looking Infrared flights	Each	None	0	0	0	0	0	0	0	0	1	0	0	0	1
Ricca Theses[vi]	Each	1999	0	0	0	0	0	0	0	0	0	0	0	0	1
Whitney Theses[vii]	Each	2000	0	0	0	0	0	0	0	0	0	0	0	0	1
OSU Project[viii]	Each	None	0	0	0	0	0	0	0	0	0	1	0	0	1
Publications [ix]	Each	127	28	16	14	7	0	0	0	7	13	8	19	9	239
Marking CWTD [x]	Each	127	28	16	14	7	0	0	0	7	13	8	19	9	239

[i] Some occurred, however, amount, location, and timing not always recorded.
 [ii] Includes burning, mowing, weed treatments, seeding.
 [iii] Includes seeding, fertilization, selenium on a 21 acre plot and selenium on approximately another 18 acres.
 [iv] White oak, willow, snowberry, spirea, elderberry, ninebark, ash, maple, white alder, redstem ceanothus, buckbrush
 [v] Log and boulder placement in stream channel to increase habitat diversity.
 [vi] Movements, Habitat Associations, and Survival of CWTD in Western Oregon.
 [vii] Ecological Relationships Between CWTD, with Epps (ODFV) and Nickerson (FWS)
 [viii] Possible Human Impacts to CWTD, with Epps (ODFV) and Nickerson (FWS)
 [ix] Whitney, L. W., R. G. Anthony, and D. H. Jackson, 2011. Resource Partitioning between Sympatric Columbian White-tailed and Black-tailed deer in Western Oregon. J. Wildl. Manage. 75(3):631-645
 [x] Ricca, M.A., R.G. Anthony, D. H. Jackson, and S.A. Wolfe, 2003. Spatial use and habitat associations of Columbian white-tailed deer in western Oregon. Journ. Wildl. Manage. 66(4):1255-1266.
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 [xii] Ear-tag, VHF and GPS transmitters. Includes male & female, adult and fawn, for Ricca, Whitney, fawn survival, burn plot, and forage plot studies.

Figure 10. Prescribed burning in 2007.



Figure 11. Stream restoration.



Figure 12. Livestock pilot grazing program 2012.



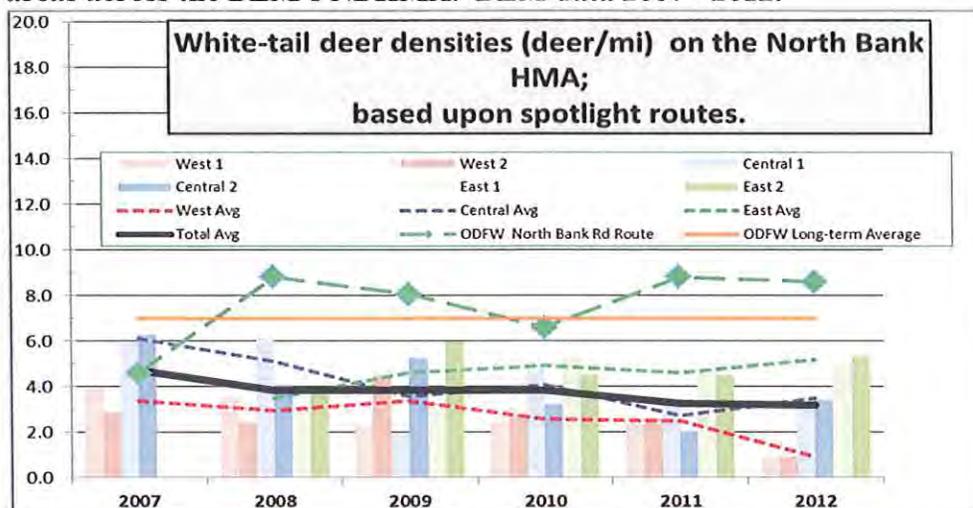
Figure 13. Livestock exclosure monitoring 2012.



As mentioned above surveys for CWTD have been conducted at the NBHMA and along its primary access road, North Bank Road. The land condition along the 15-mile long North Bank Road is primarily ranch and farm style land uses. This includes oak woodlands, cattle and upland pasture management, row crops and hay products. The North Umpqua River and riparian habitat borders a significant portion of North Bank Road. A pattern exists in that the number of CWTD deer/mile (see Figure 9) as well as the number of young/adults is greater along North Bank Road compared to the NBHMA (ODFW unpublished data).

Within the NBHMA, the BLM is focusing much of its active management, such as prescribe burning, oak woodland restoration and riparian enhancement primarily on the eastside of the area. Both the west and central portions receive significantly less active management. While it is unclear whether there is a cause and effect, the abundance of deer is relatively higher in the more managed east side of the BLM area (Figure 14). More years of data will be needed to see if this active management-deer population relationship continues this pattern.

Figure 14. Relative comparison of CWTD densities partitioned by three geographic areas across the BLM’s NBHMA. BLM data 2007 - 2012.



The Executive Summary of the revised recovery plan noted that, “After ‘recovery’ the Douglas County population will require on-going maintenance and management to continue the secure status” (USFWS 1983). This need for continued management after delisting was reaffirmed in the delisting decision (USFWS 2003). Thus, like many listed species, the CWTD is likely conservation- reliant (Scott et al. 2010) and the continued monitoring of the CWTD population at the NBHMA will help inform the degree to CWTD need some form of active habitat management.

While the results of the post delisting monitoring show continued upward trends in population size and range, monitoring data is just becoming available to answer emerging issues regarding the value of secure habitat to the deer. For example:

Is North Bank Habitat Management Area important to continued CWTD recovery?

If so then:

- How many deer occur within the area?

- Is habitat quality within the area sufficient to provide for deer abundance and health and can this question be answered adequately to affect management?
- To what extent are there possible conflicts between recreational activities on the area (such as spring and fall turkey hunts, deer hunts, hiking, mountain biking, and equestrian activities) and deer use? And at what point would these conflicts be unacceptable, not only for the local management area but also in the context of the larger population situation?

Habitat Status Summary

Important habitats such as riparian areas and oak woodlands are being managed for CWTD Douglas County-wide. This includes the County programs along with the programs available to private landowners. While it is recognized that development pressures continue to put at risk some CWTD habitat, the habitat protection and restoration gains thus far have been commensurate, if not greater than any losses. The Service and ODFW continue to be engaged, as resources permit, to respond to notifications of projects that may impact CWTD habitat. At the time of delisting, some development was expected.

On secure habitat, while beneficial management actions for CWTD are being implemented, it is unclear how well the deer are doing on secured habitat areas such as NBHMA, Kanipe and Whistler's Bend Parks. In addition to North Bank, population monitoring of CWTD would be valuable to have at these Parks. Much progress has been made the past few years in terms of beneficial active management at NBHMA and has included the collaborative interagency approach of managing the parcel along with continued prescribed burns and the reintroduction of livestock under a pilot grazing program. While it seems that some form of management at the NBHMA may benefit the deer, for example on the eastside of area, continued monitoring would be beneficial to ascertain the benefits and whether these activities should be applied to the other portions of the ranch for this conservation-reliant species.

IV. CWTD HUNTS IN DOUGLAS COUNTY

The ODFW is responsible for the state's management of wildlife and when appropriate, may offer recreational harvest opportunities of game animals to the public. In 2005, the Oregon Fish and Wildlife Commission approved a limited number of rifle buck tags (Hunt # 123- Umpqua) for hunting CWTD within Douglas County, excluding the NBHMA. The oak woodland/savannah and riparian habitat areas heavily utilized by white-tailed deer meant the majority of hunting opportunity would be located at lower elevations on private lands. Therefore, the general public would have fairly restricted access to hunting white-tailed deer. However, it was the first opportunity hunters would have to hunt Columbian white-tailed deer since their listing as an endangered species in 1978. Although the hunt was only 12 days long in early October, it was well received by landowners who supported white-tailed deer populations on their lands throughout the 25 year closure.

Up until 2006, hunting on NBHMA was geared towards the reduction of black-tail deer to reduce competition with white-tailed deer. There were three youth hunts (any black-tail bag limit) and one hunt for Master Hunters (antlerless black-tail only). In 2006, ODFW began to provide some limited public hunting opportunity for white-tailed deer on the NBHMA by creating three new hunts and modifying an existing one. The new hunts were for archery hunters (Hunt # 123R2- N Bank Habitat Bow), muzzleloader hunters (Hunt # 123M2- N Bank Habitat) and rifle hunters (Hunt # 123B- N Bank Habitat). The first youth hunt (Hunt # 623T1- N Bank Habitat) was modified to allow youth hunters the same opportunity as the three new hunts, to harvest a buck white-tailed deer or any black-tailed deer.

Since 2005, when the harvest of a white-tailed buck was allowed, approximately 600 hunters have participated in hunts offering an opportunity for the hunter to harvest a white-tailed buck. During this period, over 300 white-tailed bucks have been harvested (Table 7) (Figure 15) and about 20 percent of the harvest has occurred on the NBHMA. For example, hunters have harvested at least 148 buck deer (63 white-tailed bucks and 85 black-tailed-bucks) since 2006 when hunting within the NBHMA was initiated and it is likely that longer hunting seasons along with more hunts on the NBHMA have contributed to this harvest. At this time, ODFW believes hunting is an appropriate management tool for CWTD.

Figure 15. Harvested Columbian white-tailed deer.



Table 7. Annual results for Douglas County Deer Hunts, including both Columbian white-tailed deer (CWTD) and black-tailed deer (BTD) from 2005 - 2012. Data provided by ODFW.

Hunt	Sold	LOP	Did Not Hunt	Hunted	Days Hunted	# Harvested	CWTD Buck	BTD Buck	BTD Doe	Days/Hunter	Days/Deer
2005	123	121	99	15	96	332	57	6	N/A	3.5	5.8
2006	123A	93	72	22	71	309	27			4.4	11.4
	123B ¹	10	0	2	8	32	6	3		4.0	5.3
	123R1	14	0	2	12	70	6			5.8	11.7
	123R2 ¹	17	0	0	14	87	3	0		6.2	29.0
	123M2 ¹	9	0	0	9	47	2	0		5.2	23.5
	623T1 ¹	32	0	6	26	108	18	8	1	4.2	6.0
2007											
	123A	77	55	11	66	223	48	10	0	3.4	4.6
	123B ¹	10	0	2	8	31	6	3	0	3.9	5.2
	123R1	19	0	3	16	71	11			4.4	6.5
	123R2 ¹	16	0	2	14	62	2	0	0	4.4	31.0
	123M2 ¹	10	0	1	9	46	2	2	0	5.1	23.0
	623T1 ¹	31	0	1	30	90	10	8	0	3.0	9.0
2008											
	123A	83	62	14	69	261	43	15		3.8	6.1
	123B ¹	8	0	2	6	26	5	3	0	4.3	5.2
	123R1	25	0	2	23	102	4	0	0	4.4	25.5
	123R2 ¹	16	0	2	14	64	0			4.6	0.0
	123M2 ¹	9	0	0	9	63	2	0		7.0	0.0
	623T1 ¹	33	0	4	29	80	18	14	2	2.8	0.0
2009											
	123A	81	59	18	63	273	20	4	0	4.3	13.7

Hunt	Sold	LOP	Did Not Hunt	Hunted	Days Hunted	# Harvested	CWTD Buck	BTD Buck	BTD Doe	Days/Hunter	Days/Deer
123B ¹	8	0	0	8	25	5	3	2	0	3.1	5.0
123R1	26	0	3	23	101	10	7	0	3	4.4	10.1
123R2 ¹	18	0	0	18	83	4	0	2	2	4.6	20.8
123M2 ¹	10	0	0	10	50	4	2	2	0	5.0	12.5
623T1 ¹	30	0	0	30	114	12	2	8	2	3.8	9.5
2010											
123A	92	71	18	74	233	32	30	2	0	3.1	7.3
123B ¹	5	0	0	5	15	2	1	1	0	3.0	7.5
123R1	31	1	14	17	138	8	4	4	0	8.1	17.3
123R2 ¹	9	0	5	4	6	0	0	0	0	1.5	-
123M2 ¹	4	0	1	3	36	3	1	2	0	12.0	12.0
623T1 ¹	28	0	0	28	89	12	5	6	1	3.2	7.4
2011											
123A	80	58	9	71	276	43	41	2	0	3.9	6.4
123B ¹	5	0	1	4	10	4	2	2	0	2.5	2.5
123R1	43	0	7	18	104	0	0	0	0	5.8	-
123R2 ¹	10	0	1	9	51	0	0	0	0	5.7	-
123M2 ¹	3	0	1	2	4	1	1	0	0	2.0	4.0
623T1 ¹	30	0	3	27	80	18	0	7	2	3.0	4.4
2012											
123A	89	76	4	85	357	43	36	7	0	4.2	8.3
123B ¹	5	0	0	5	18	4	4	0	0	3.6	4.5
123R1	46	0	18	28	202	19	6	11	2	7.2	28.9
123R2 ¹	7	0	2	5	15	0	0	0	0	3.0	-
123M2 ¹	5	0	0	5	18	4	4	0	0	3.6	4.5
623T1 ¹	31	0	2	29	82	18	4	12	2	4.3	4.6

¹ North Bank Habitat Management Area hunts.

V. CWTD STATUS BASED ON THE FIVE FACTOR LISTING ANALYSIS

Section 4 of the Endangered Species Act specifies five factors to be considered when determining if a species is threatened or endangered. These same five factors were reviewed in determining if the Douglas County population merited removal from the list in 2003. In this section, we briefly review the status of the five factors and current conditions.

1. The present or threatened destruction, modification, or curtailment of habitat or range.

CWTD population numbers (and distribution) continue an increasing trend through 2012 with the current and highest recorded population estimate at over 6,900 individuals. This evidence along with the triggers set forth in the Post-Delisting Monitoring Plan indicates that CWTD recovery is on track (see Section I Population Trends herein).

In many areas of the DPS, habitat continues to be managed for the benefit of the deer, and deer are utilizing additional habitats as a result of the transplant program. No new significant threats to habitat or range are apparent. However, to date, monitoring data is preliminary and it is too early to ascertain CWTD habitat quality within NBHMA and other secured habitat, such as Mildred Kanipe Park, with respect to restoration actions (i.e., removal of non-native invasive plants, prescribed burns, pilot livestock grazing, and forage plots) so as to evaluate the effectiveness of active management actions on the deer and their habitat.

2. Overutilization for commercial, recreational, scientific, or educational purposes.

Since 2005 over 600 hunters have participated in hunts offering an opportunity for the hunter to harvest a white-tailed buck. During this period, approximately 300 CWTD bucks have been harvested. Specific to NBHMA, hunters have harvested at least 148 buck deer (63 CTWD and 85 CBTD) since 2006 when hunting within the NBHMA was initiated. At this time, the ODFW sees no reason to discontinue the limited hunts but will continue to monitor and regulate harvest.

There appears to be however, some concern with other recreational uses such as other types of hunting, mountain biking, hiking, etc on CWTD habitat use and physical condition. This concern is based on local anecdotal evidence and on studies of other ungulates that suggest a decline in deer health when faced with many disturbance factors. Monitoring of these uses and deer response in the DPS is difficult due to cost and the number of variables involved. The NBHMA may present a good opportunity to design a study to ascertain the extent of such recreational uses on CWTD due to being able to control the amount of visitor traffic to some extent.

3. Disease or predation.

Adenovirus hemorrhagic disease and deer hair-loss syndrome disease, while present in the population, is not prevalent in the deer population. Chronic wasting disease has not been

detected in Oregon, and poses no threat at this time. Monitoring by ODFW will continue as part of their standard disease monitoring effort.

4. Inadequacy of existing regulatory mechanisms.

No threats associated with this factor are apparent. Existing regulatory mechanisms are in place to manage a controlled deer harvest and land use planning regulations are in place in Douglas County. While some development was expected per the Recovery Plan, continued habitat restoration and conservation is improving habitat quality, helping to ameliorate the limited habitat losses. Monitoring efforts focusing on habitat loss, habitat restoration and deer habitat use should continue.

5. Other natural or manmade factors affecting its continued existence.

At this time, no other factors are identified as a concern to the deer population.

Overall, our evaluation of the five factors lead us to conclude that while there are a few key areas of concern related to CWTD habitat management, the overall population trend is increasing and therefore believe the population does not warrant consideration for relisting.

VII. CONCLUSIONS AND RECOMMENDATIONS

Based on information presented in this report, we believe the threats to the CWTD do not cause concern, and conclude CTWD in Douglas County remain secure absent the protections provided by the Act. Additionally, the population and habitat parameters are sufficiently above the monitoring triggers for potential relisting consideration. However, we also believe current monitoring data is limited to analyze the effects to deer from the following:

- The status of deer population trends and habitat quality on secure habitat (NBHMA, Kanipe Park and Whistler's Bend Park),
- Role of habitat restoration activities in maintaining or improving deer condition, and/or population levels, and
- The effects of interaction between deer and the human recreation activities (e.g., hunting, equestrian, dog walking, hiking and biking) on deer condition and population levels.

To allow time to establish population trends on secure habitat, we find the Post Delisting Monitoring Period should continue for another five years, through the end of 2017. Prior to the end 2017, the cooperating agencies and other interested groups will be convened by the Service to consider whether extension is necessary.

In the meantime, the following recommendations are provided:

- Continue the spotlight counts within the NBHMA to establish trend data for deer occurrence with the NBHMA.
- Analyze effects of hunts on the deer population on NBHMA.

- Continue to analyze data on deer health using information gathered from deer capture and harvest data.
- Evaluate and monitor habitat restoration, including the role of oak woodland/savannah restoration in relation to deer habitat use.
- Continue the monitoring effort on NBHMA using GPS radio-collars on deer to evaluate deer use of various habitat types including areas treated by prescribed fire, mowing, grazing, planting and seeding.
- Develop a monitoring program to evaluate the interactions within and between recreational uses and the deer populations occurring within secure habitat.
- Continue to provide review and comment regarding development in the range of the deer within Douglas County.
- Determine the feasibility of utilizing livestock grazing, in particular at NBHMA, to improve forage quality and palatability.
- Determine habitat quality on secured habitat such as Kanipe and Whistler's Bend Parks.
- Conduct spot-light surveys at Kanipe and Whistler's Bend to determine CWTD population size.
- Determine factors contributing to County-wide reduction in doe-to-fawn ratios.

To assist in the planning and implementation of these recommendations, ODFW, BLM, and the Service will continue to meet quarterly, and more frequent as necessary, to further enhance communication and cooperative management of the deer and their habitat. Included in the coordination is the need to prioritize implementation of the above recommendations commensurate with workload and budgetary considerations. The agencies will also continue to commit to the NBHMA interdisciplinary team and will make every attempt to attend these meetings and field tours.

With detailed information from these specific actions and commitments, we can better evaluate the continued stresses on local deer herds and the effectiveness of habitat restoration and the possible benefits derived by this conservation-reliant species depending on the secure habitat within the range of the deer.

It is the partnership and collaborative investments by the Service, BLM, ODFW and Douglas County which will define the successful management of this conservation-reliant species. The current post-delisting monitoring program and management activities, if allowed to adapt and investigate new emerging issues as they arise, appears to provide adequate information for the management of the deer and its habitat into the future.

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