

# *Appendix B*

## *Compatibility Determinations*



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## Introduction

The compatibility determinations (CDs) developed during the comprehensive conservation plan (CCP) planning process evaluates uses as projected to occur under Alternative 2, the Preferred Alternative in the draft environmental impact statement (EIS) for Malheur National Wildlife Refuge CCP (CCP/EIS). The evaluation of funds needed for management and implementation of each use also assumes implementation as described under Alternative 2. Chapter 6 of the draft CCP/EIS also contains analysis of the impacts of public uses to wildlife and habitats. That portion of the document is incorporated through references into this set of CDs.

### Uses Evaluated at This Time

The following section includes full CDs for all refuge uses that are required to be evaluated at this time. According to Service policy, CDs will be completed for all uses proposed under a CCP that have been determined to be appropriate. Existing wildlife-dependent recreational uses must also be reevaluated and new CDs prepared during development of a CCP. According to the Service’s compatibility policy, uses other than wildlife-dependent recreational uses are not explicitly required to be reevaluated in concert with the preparation of a CCP, unless the conditions of the use have changed or unless significant new information related to the use and its effects has become available, or the existing CDs are more than 10 years old. However, the Service planning policy recommends preparing CDs for all individual uses, specific use programs, or groups of related uses associated with the proposed action. Accordingly, the following CDs are included in this document for public review.

**Table B-1. Summary of Compatible Use Determinations**

#	Refuge Use	Page	Appropriate?	Compatible?	Year Due for Reevaluation
B.1	Wildlife Observation, Photography, and Interpretation	B-4	N/A	Yes	2027
B.2	Environmental Education	B-20	N/A	Yes	2027
B.3	Waterfowl Hunting	B-29	N/A	Yes	2027
B.4	Upland Game Hunting	B-44	N/A	Yes	2027
B.5	Fishing	B-61	N/A	Yes	2027
B.6	Commercial Tours and Photography	B-72	Yes	Yes	2022
B.7	Grazing and Haying	B-80	Yes	Yes	2022
B.8	Plant Gathering of Culturally Important Plants	B-109	Yes	Yes	2022
B.9	Research, Scientific Collecting, and Surveys	B-114	Yes	Yes	2022
B.10	Farming	B-121	Yes	Yes	2022

## **Compatibility: Legal and Historical Context**

Compatibility is a tool refuge managers use to ensure that recreational and other uses do not interfere with wildlife conservation, the primary focus of refuges. Compatibility is not new to the Refuge System and dates back to 1918 as a concept. As policy, it has been used since 1962. The Refuge Recreation Act of 1962 directed the Secretary of the Interior to allow only those public uses of refuge lands that were “compatible with the primary purposes for which the area was established.”

Legally, refuges are closed to all public uses until officially opened through various administrative actions, including CDs. Regulations require that adequate funds be available for administration and protection of refuges before opening them to any public uses. However, wildlife-dependent recreational uses (hunting, fishing, wildlife observation, photography, interpretation, and environmental education) are to receive enhanced consideration and cannot be rejected simply for lack of funding, unless the refuge has made a concerted effort to seek out funds from all potential partners. Once found compatible, wildlife-dependent recreational uses are deemed the priority public uses at a refuge. If a proposed use is found not compatible, the refuge manager is legally precluded from approving it. However, a use found not compatible may be modified such that it can be found compatible. Economic uses that are conducted or authorized by the refuge also require CDs.

Under compatibility policy, uses are defined as recreational, economic/commercial, or management-related uses of a refuge by the public or a non-Refuge System entity. Uses generally providing an economic return (even if conducted for the purposes of habitat management) are also subject to CDs. The Service does not prepare CDs for uses where the Service does not have jurisdiction. For example, the Service may have limited jurisdiction over refuge areas where property rights are vested by others; where legally binding agreements exist; or where there are treaty rights held by tribes. In addition, aircraft overflights, emergency actions, some activities on navigable waters, and activities by other Federal agencies on “overlay Refuges” are exempt from the compatibility review process.

New compatibility regulations, required by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act), were adopted by the Service in October 2000 (U.S. Fish and Wildlife Service [USFWS] 2000). The regulations require that a use must be compatible with both the mission of the System and the purposes of the individual refuge. This standard helps to ensure consistency in application across the Refuge System. The Act also requires that CDs be in writing and that the public have an opportunity to comment on most use evaluations.

The Refuge System mission emphasizes that the needs of fish, wildlife, and plants must be of primary consideration. The Improvement Act defined a compatible use as one that “... in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the Refuge.” Sound professional judgment is defined under the Improvement Act as “... a finding, determination, or decision, that is consistent with principles of sound fish and wildlife management and administration, available science and resources ....” Compatibility for priority wildlife-dependent uses may depend on the level or extent of a use.

Court interpretations of the compatibility standard have found that compatibility is a biological standard and cannot be used to balance or weigh economic, political, or recreational interests against the primary purpose of the Refuge (*Defenders of Wildlife v. Andrus* [Ruby Lake Refuge]).

The Service recognizes that CDs are complex. For this reason, refuge managers are required to consider “principles of sound fish and wildlife management” and “best available science” in making these determinations (House of Representatives 1997). Evaluations of the existing uses on Malheur National Wildlife Refuge are based on the professional judgment of Refuge and planning personnel including observations of Refuge uses and reviews of appropriate scientific literature.

In July 2006, the Service published its Appropriate Refuge Uses Policy ([603 FW 1](#)). Under this policy, most proposed uses must also undergo a review prior to compatibility. Uses excepted from the policy include the Big Six uses and uses under reserved rights—see the policy for more detail. Appropriate uses reviews are included in Appendix A.

## References

- Defenders of Wildlife v. Andrus (Ruby Lake Refuge I). Case 2098 (D.D.C. 1978). Environmental Reporter 11:873.
- House of Representatives. 1997. Report 105-106 on National Wildlife Refuge System Improvement Act. Available at: [http://www.fws.gov/Refuges/policiesandbudget/HR1420\\_part1.html](http://www.fws.gov/Refuges/policiesandbudget/HR1420_part1.html).
- USFWS (U.S. Fish and Wildlife Service). 2000. Compatibility regulations. Available at: <http://www.fws.gov/Refuges/policymakers/nwrpolicies.html>. Accessed June 23, 2011.

## **B.1 Wildlife Observation, Photography, and Interpretation Compatibility Determination**

**RMIS Database Uses:** Wildlife Observation; Photography (wildlife); Interpretation

**Refuge Name:** Malheur National Wildlife Refuge

### **Establishing and Acquisition Authorities and Refuge Purposes**

- “ ... a Refuge and breeding ground for migratory birds and other wild life ... ” Executive Order 7106, dated July 19, 1935, as modified by Public Land Order 1511, dated September 24, 1957
- “ ... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act)
- “ ... for the development, advancement, management, conservation, and protection of fish and wildlife resources ... ” 16 U.S.C. 742f(a)(4)
- “ ... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ... ” 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)
- “ ... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans ... ” 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

### **National Wildlife Refuge System Mission**

The mission of 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” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd et seq.]).

### **Description of Use**

This CD examines wildlife observation, wildlife photography, and interpretation as proposed under Preferred Alternative 2 of the Malheur Refuge draft CCP/EIS. There is substantial overlap between activities associated with wildlife observation, wildlife photography, and interpretation on the Refuge, and as such these uses are evaluated together in this CD. Associated uses include hiking, motorized boating (electric), and non-motorized boating. Horseback riding, cross-country skiing, and bicycling also may occur incidental to these uses, but at very low levels (<5 visits per year per activity); they are analyzed as part of this CD.

**Program Offerings:** Under Preferred Alternative 2, the uses would continue to occur primarily informally as self-guided activities. However, in addition, monthly, docent-led tours would be established to diversify the visitor experience and opportunities for these uses, including kayaking or canoeing tours on Malheur Lake by Refuge staff and/or qualified volunteers.

**Location of Use:** Visitors typically engage in wildlife observation, wildlife photography, and interpretation uses at the Refuge Headquarters, along Center Patrol Road on the Auto Tour Route,

and at a number of historic and interpretive sites, including Benson Pond, the historic Sodhouse Ranch, Buena Vista Overlook, Krumbo Reservoir, and the historic P Ranch. The historic Sodhouse Ranch is a significant resource for colonial nesting great blue herons and cormorants and winter roosting for bald eagles; the site would continue to be closed for the majority of the year to prevent disturbance, but it is open to the public from August 15 through October 15, after peak wildlife activity has subsided and before bald eagles roost in the winter. Krumbo Reservoir provides habitat for migrating loons in early spring and fall, and eared grebes during winter nesting season. Under Preferred Alternative 2, Krumbo Reservoir would be opened to year-round wildlife observation, photography, and interpretation. Non-motorized boats or boats with electric motors would be allowed on Krumbo Reservoir to support these uses. Other areas on the Refuge would be occasionally visited during docent-led tours.

***Associated Facilities:*** A network of pull-offs, viewpoints, kiosks, overlooks, and hiking trails that vary in length from less than 1 mile to 11 miles would support these uses. Preferred Alternative 2 provides more opportunities for developed wildlife observation, photography, and interpretation programs and structured visitor experiences with enhanced facilities and improved access. An enlarged visitor contact station/gift shop and office would be developed at Refuge Headquarters, as well as a seasonal contact station at the P Ranch. Additional developed visitor amenities (including restrooms, vault toilets, picnic tables, and shelters), new interpretive panels, vehicle pull-outs, viewing overlooks and elevated viewing platforms, and permanent photography blinds would be constructed throughout the Refuge at specific strategic public use locations.

***Access:*** As is the case currently, use would be permitted for vehicles on public roads; on foot along roads open to motorized vehicles and designated hiking trails; and, occasionally, for boats. Except for docent-led tours (which would occur monthly and during special events), which may venture farther afield, public access would remain confined to roads and trails. Road access would be expanded by opening the Boat Landing Road to the Malheur Lake airboat launch site near Refuge Headquarters and the East Canal Road to the confluence of Bridge Creek with the East Canal. Additional loop, spur, and Americans with Disabilities Act (ADA) trails would be created, resulting in a total of 44 miles of roads and 17 miles of trails open to public access under Preferred Alternative 2. In contrast to current management, occasional canoe/kayak access via docent-led tours would be encouraged on Malheur Lake.

***Number of Visitors and Seasonal Patterns:*** Wildlife observation, photography, and interpretation are expected to remain the most popular activities on Malheur Refuge over the life of the CCP. An estimated 93 percent of Refuge visitors engage in bird-watching and other forms of wildlife observation. Current annual visits associated with wildlife observation are estimated at 61,000. Annual visits associated with interpretation are estimated at 52,000, and annual visits associated with wildlife photography are also estimated at 52,000 (visits are tabulated separately). Wildlife observation, photography, and interpretation occur year-round on the Refuge, but peak during spring migration (March to May) and fall migration (September). The remainder of the year, the Refuge may see less than 100 visitors per month. As a result of the emphasis on enhanced facilities, expanded access, and more special events and programs under Preferred Alternative 2, these uses would be expected to grow over 15 years to 82,000 visits per year for wildlife observation, 71,000 visits per year for photography, and 71,000 visits per year for interpretation (visits are tabulated separately).

**Availability of Resources**

Availability of resources for administering and managing wildlife observation, photography, and interpretation under Preferred Alternative 2 are detailed in Table B-2.

**Table B-2. Costs to Implement the Use**

<b>Category</b>	<b>One-time Expenses (\$)</b>	<b>Recurring Expenses (\$/year)</b>
<b>Welcome and Orientation (W&amp;O)</b>		
Update existing W&O panels and develop new panels at four locations	\$120,000	\$500
Maintain existing and develop two new vault toilets	\$50,000	\$5,000
Maintain existing and develop new visitor amenities, including accessible picnic tables, trash cans, and shelters	\$7,500	\$5,000
Construct enlarged visitor contact station and gift shop	\$250,000	\$10,000
Rehabilitate George Benson Memorial Museum facility	\$50,000	
Establish seasonal contact station at P Ranch	\$45,000	\$3,000
Develop modern media W&O materials, maintain website, etc.		\$1,000
<b>Wildlife Observation, Photography, Interpretation</b>		
Conduct docent-led canoe/kayak tours on Malheur Lake	\$100,000	\$15,000
Advertise, train volunteers, and conduct other monthly land-based docent tours monthly, plus special events	\$50,000	\$5,000
Provide new non-ADA trails and develop new trail signage	\$72,000	\$2,000
Provide new ADA trails at Sodhouse Ranch, Benson Pond, P Ranch	\$225,000	\$2,000
Construct wildlife-viewing overlook at Krumbo Reservoir	\$40,000	\$1,000
Construct four elevated viewing platforms	\$220,000	\$4,000
Provide three photography blinds	\$30,000	\$1,000
Maintain historical landscapes for birding		\$1,000
Develop new interpretive panels	\$45,000	\$1,000
Administer and manage programs		\$55,000
<b>Transportation</b>		
Raise and surface Center Patrol Road	\$1,200,000	\$100,000
Develop additional vehicle pull-offs	\$52,500	
Improve vehicle access along East Canal Road	\$90,000	
Improve vehicle access at Boat Landing Road, including pull-offs	\$45,000	
Maintain Krumbo Lane		\$10,000
Develop parking areas to assist with public use programs	\$150,000	

Category	One-time Expenses (\$)	Recurring Expenses (\$/year)
Overall road maintenance (public roads, pull-offs, parking areas)		\$20,000
<b>Total</b>	\$2,792,000	\$241,500

Wildlife observation, photography, and interpretation are the biggest programs on the Refuge and attract the most visitors and visits. The Refuge has one full-time equivalent (FTE) position dedicated to the visitor services program as a Visitor Services Manager, with a majority of time spent on administering and managing the wildlife observation, photography, and interpretation program. There are two additional FTE positions supporting cultural resources programs and law enforcement needs. Other Refuge staff assist in trail and parking area maintenance, facility and road maintenance, sign posting, and construction projects. The Refuge has a strong volunteer base, and the visitor center and tours are generally staffed by volunteers during the high visitation months from May to September.

Some capital projects may currently lack funding, but the Refuge would develop partnerships and seek additional funding resources over the next 15 years as necessary to complete projects. Based on the availability of resources, the Refuge would have sufficient funds for managing current and expected levels of uses associated with wildlife observation, photography, and interpretation. Exact costs will be developed during design and implementation.

Welcome and orientation facilities, signage, access trails, and other transportation resources are used for multiple purposes across programs, including environmental education, hunting, and fishing. Program-specific facilities and resources are included in the appropriate CDs.

**Anticipated Impacts of the Uses**

General Impacts Expected from the Scientific Literature

A general assessment of impacts resulting from wildlife observation, photography, and interpretation uses has been compiled from the literature and is briefly summarized below.

**Disturbance Intensity (Frequency, Distance, etc.):** Human activities on recreational lands, trails, and other access points can result in direct effects on wildlife. Disturbance responses can depend upon the activity type, recreationists’ behavior, and the distance, duration, frequency, predictability, timing, and visibility of the use (Knight and Cole 1995). Disturbance to migrant shorebirds on eastern coastal bays was found to increase as the total number of disturbances and recreationists increased and the distance from the disturbance decreased (Burger 1986). Flushing, especially repetitive flushing, can strongly impact patterns of many bird species. Migratory birds have been observed to be more sensitive than resident species to disturbance (Klein 1989), and in the case of the eastern coastal migrant shorebirds, the percentage of observed shorebirds that were flushed and did not return increased by 53 percent from 1982-2002, suggesting that the birds were not adapting to the presence of people by habituation and were being affected in the long-term (Burger et al. 2004).

Nest predation for songbirds (Miller et al. 1998), raptors (Glinski 1976), colonial nesting species (Buckley and Buckley 1976), and waterfowl (Boyle and Samson 1985) tends to increase in areas more frequently visited by people, where disturbance flushes birds away from their nests and creates

vulnerabilities during nesting seasons. Frequency is a major factor, and songbirds have been found to alter behavior after repeated human disturbance, particularly red-winged blackbirds, goldfinches, and American robins, which became much more aggressive toward humans who repeatedly visited their nests (Knight and Temple 1986a, 1986b, 1986c).

Set-back distances for public use facilities have been found to be important in limiting human disturbance to wildlife. In Florida, 15 species of colonial waterbirds nesting at 17 colonies were exposed to three different human disturbance mechanisms in order to determine recommended set-back distances for protecting mixed-species nesting assemblages (Rodgers and Smith 1995). In general, a recommended set-back distance of about 100 meters (328 feet) for wading bird colonies and 180 meters (590 feet) for mixed tern/skimmer colonies was found to be adequate to effectively buffer sites from human disturbance caused by approach of pedestrians and motor boats (Rodgers and Smith 1995). In Nebraska, roosting sandhill cranes avoided sites near human disturbance features at 500 meters (m [1,640 feet]) from nearest paved road, 400 m from nearest gravel road, and 400 m from a single dwelling structure (Norling et al. 1992). Conversely, wildlife tends to habituate best to disturbance that is predictable, as indicated by sandhill cranes in Florida and in Nebraska that nested within 400 m of highways, railroads, mines, and power lines, which provided predictable background disturbance (Dwyer and Tanner 1992; Norling et al. 1992).

**Group Size:** Disturbance impacts to wildlife related to visitor group size is not a well-documented research area; however, a few studies have analyzed these impacts. Most animals flee from humans, and large groups of people may represent greater perceived risk of predation (Geist et al. 2005). Remacha et al. (2011) analyzed visitor group size influences on the number and variety of birds observed during guided educational tours in a forested area in central Spain, with group sizes ranging from 7 to 20 people. The study showed that increasing visitors' group size has an impact on wildlife, as large groups were associated with decreased bird numbers; additionally, the study found that birds may demonstrate reduced tolerance not only by reducing their frequency of occurrence but also by reducing the number of individuals when faced with large groups of visitors. The study concluded that reducing the size of visitors' groups helps to minimize the negative impacts on wildlife and also allows visitors to watch more wildlife (Remacha et al. 2011).

Another study by Beale and Monaghan (2004) on human disturbance effects to seabird colonies at St. Abbs Head National Nature Reserve in Scotland examined the variation in nesting success for two birds, kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*), as a function of different disturbance regimes, including varying the average number of people per hour and people load, which takes into consideration the number of visitors and their distance from the nest. Human disturbance was found to have a significant negative effect on the nesting success in both species of birds. Increasing visitor numbers by 8.5 percent resulted in a 22 percent increase in the failure rate of kittiwakes, and a 13 percent increase in the failure rate for guillemots. Beale and Monaghan concluded that perhaps the most likely explanation is that nesting birds perceive people to be a potential predator and show appropriate anti-predator physiological responses, which interfere with energy resources available for nesting. The results showed that safe distances, or buffer zones, depend on the numbers of people visiting an area, and that both numbers and distance matter in determining disturbance effects.

In addition to group size, loudness has also been found to be an important variable in determining whether birds altered their behavior. A study was conducted at the Arthur B. Marshall Loxahatchee National Wildlife Refuge in Florida between 1992 and 1994 to observe how people affect foraging birds at the Refuge (Burger and Gochfeld 1991). Variation in feeding behavior was largely explained by whether people were present, the number of people present, and the amount of noise made by the

people (Burger and Gochfeld 1991). For all species, time devoted to feeding and number of strikes or pecks decreased while people were present and as the noise made by people increased; interestingly, loudness was found to be more important than the number of people present (Burger and Gochfeld 1991). Noise level is not necessarily correlated with number of people present, but larger groups might be more prone to producing noise than small groups or individuals.

Conversely, a study analyzing the impacts of groups of cross-country skiers to elk in Yellowstone National Park found that the number of skiers did not impact the elk once they were already disturbed by the first skier, and instead the amount of winter range used by skiers and the number of days involved seemed to be more important than skier numbers (Cassierer et al. 1992). Literature suggests that organizing visitors in small numbers is recommended for groups, but also spreading out visits and locations of visits is recommended to mitigate disturbance across the landscape.

***Impacts of Pedestrian (Hiking) vs. Vehicular Access:*** It is widely accepted that wildlife is frequently more sensitive to disturbance from people on foot than in vehicles (Skagen 1980; Grubb and King 1991; MacArthur et al. 1982; Pease et al. 2005). Numerous studies have confirmed that people on foot can cause a variety of disturbance reactions in wildlife, including flushing or displacement (Erwin 1989; Fraser et al. 1985; Freddy 1986; Pease et al. 2005), heart rate increases (MacArthur et al. 1982), altered foraging patterns (Burger and Gochfeld 1991), and even, in some cases, diminished reproductive success (Boyle and Samson 1985).

A study on seven species of dabbling ducks at the Back Bay National Wildlife Refuge found a significant difference between vehicular (diesel truck and electric passenger tram) and non-vehicular (pedestrian and bicyclist) treatments in the number of ducks that were flushed. In this study, 90 percent of the birds showed an observable response to non-vehicular treatments, of which 43 percent flew; the proportion of ducks that flew was greatest when they were located less than 100 m from the disturbance (Pease et al. 2005). In a review of several studies of the reaction of waterfowl and other wetland birds to people on foot, it was found that distances greater than 100 m in general did not result in a behavioral response (DeLong 2002). Mule deer in sagebrush-grassland habitat in Utah showed a 96 percent probability of flushing at 100 m from the line of movement of off-trail recreationists, with the percentage not dropping to 70 percent until the perpendicular distance increased to 390 m (Taylor and Knight 2003).

Wildlife photography in particular can be a more disturbing activity because photographers are more likely to leave vehicles and wander off-trail, approach wildlife, and remain close for an extended period of time to capture a detailed photograph, as observed at Ding Darling National Wildlife Refuge and other places (Klein 1993; Morton 1995; Dobb 1998). This may also apply to the experience of the user, as avid wildlife viewers tend to intentionally seek out rare or spectacular species and/or are more eager to use the most viewing opportunities in the limited amount of time (e.g., bird listing) and thus potentially pose a larger negative impact to wildlife (Knight and Cole 1995). People engaged in wildlife observation and photography react to the presence of birds and thus are generally more unpredictable on foot depending on excitement level, curiosity, and desire to observe closely.

***Impacts of Cross-country Skiing:*** In two different studies of winter recreation impacts to wildlife in Yellowstone National Park, Aune (1981) and Cassierer (1990) found that, except for coyotes, all wildlife species observed (mostly big game) reacted more quickly to an approaching skier than to a snowmobile, and the flight distance was generally greater from skiers. Bison were found to respond dramatically to skiers who were off established trails. In another study, elk began to move when

skiers approached to within 15 m in an area heavily used by humans year-round, and within 400 m in an area where human activity is much lower (Cassirer et al. 1992).

**Boating Impacts:** Recreational boating can alter bird distribution, reduce the use of particular habitats or entire areas by waterfowl and other waterbirds, alter feeding behavior and nutritional status, and cause premature departure from areas due to the noise and speed of boats (Knight and Cole 1995; Knapton et al. 2000). Canoes and kayaks can cause significant disturbance effects based on their ability to penetrate into shallower marsh areas (Speight 1973; Knight and Cole 1995). In the Ozark National Scenic Riverway, green-backed heron activity declined on survey routes when canoes and boat use increased on the main river channel (Kaiser and Fritzell 1984). Canoes or slow-moving boats have also been observed to disturb nesting great blue herons (Vos et al. 1985). Huffman (1999) found that non-motorized boats within 30 m (98 feet) of the shoreline in south San Diego Bay caused all wintering waterfowl to flush between the craft and shore. However, compared to motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (Jahn and Hunt 1964; Huffman 1999; DeLong 2002).

The total number of boats and people can be an inappropriate measure of recreational intensity because the presence of a single boat might be just as disturbing as that of many (Tuite et al. 1983; Knight and Knight 1984). Even a low level of boating activity affects the duration and pattern of use by wildlife (Bratton 1990).

**Bicycling Impacts:** In a Canyonlands National Park study comparing the effects of trail bikes, hikers, and vehicles to bighorn sheep behavioral responses, distances moved, and duration of responses, Papouchis et al. (2001) found that hikers caused the most severe responses in desert bighorn sheep (animals fled in 61 percent of encounters), followed by vehicles (17 percent fled) and mountain bikers (6 percent fled), apparently because hikers were more likely to be in unpredictable locations and often directly approached sheep. However, Taylor and Knight (2003), who found no difference in effects between hikers and bikers (see below), noted that Papouchis et al. compared the responses of sheep approached directly and off-trail by hikers with those of sheep approached tangentially on a road or trail by mountain bikers and vehicles. Generally, wildlife exhibit a stronger response to humans that approach them directly and to humans located off designated trails.

In a Utah study comparing mountain biking and hiking disturbance to mule deer, antelope, and bison, both on- and off-trail, Taylor and Knight (2003) found little difference between the responses to hiking or biking. However, their results did show differences in species and based on whether the activity takes place on or off the trail. They did suggest that, because bikers travel faster than hikers, they may cover more ground in a given time period than hikers, thus having the opportunity to disturb more wildlife per unit of time.

**Horseback Riding Impacts:** Impacts related to horseback riding include exotic plant seed dispersal in horse coats, forage, and manure (Beck 1993; Hammitt and Cole 1987); soil compaction and erosion (Bainbridge 1974; Hendee et al. 1990; Hammitt and Cole 1987); stream sedimentation (Wilson and Seney 1994); trail widening (Whittaker 1978); vegetation trampling (Nagy and Scotter 1974; Weaver and Dale 1978; Whittaker 1978); and direct wildlife disturbance (Owen 1973).

Vegetation and soil compaction and erosion impacts can be much more pronounced from horses than hikers (Bainbridge 1974; Hendee et al. 1990; Hammitt and Cole 1987), with soil compaction as much as 1,500 psi (pounds per square inch) exerted on the soil surface with each step (Hendee et al. 1990). Hikers tend to flatten vegetation while horses tend to chum up soil, thus cutting plants off at the

rootstalk (Whittaker 1978). Hoof action tends to dig up and puncture the soil surface (McQuaid-Cook 1978), which could cause greater sediment loss than any other form of recreational trail use and increase the potential for disturbance-tolerant vegetation establishment. Trail widening is also a consideration as horses tend to walk on the down slope sides of trails (Whitson 1974), creating a much wider area of disturbance and increasing trail maintenance problems. This can increase the spread of previously established exotics by providing loose, disturbed soil for germination and spreading reproductive plant structures.

Wildlife disturbance relative to horseback riding has been poorly studied, with most references using other activities such as hiking and cross-country skiing to infer horseback riding impacts. Only one study identified disturbance tolerance of waterfowl to horseback riders and found that horseback riders could approach geese up to a distance of 150 feet. This is compared to suggested hiking trail distances of 250 feet (Miller et al. 1998) and boat buffers ranging from 250 to 900 feet (depending on type of boat, whether motorized, and species impacted; Burger et al. 1999). The 150-foot approach distance offered by Owen (1973) is consistent with observations suggesting that horseback wildlife observers can approach wildlife at closer distances than through other form of travel. Many wildlife species appear to be habituated to livestock and thus are less likely to flee when approached through this method. However, any form of approach is expected to cause some disturbance, which will vary according to the species affected and the type, level, frequency, and duration of disturbance, as well as the time of day or year that it occurs.

***Disturbance from Dogs:*** Dogs elicit a greater response from wildlife than people on foot alone (MacArthur et al. 1982; Hoopes 1993). In the case of birds, the presence of dogs may flush incubating birds from nests (Yalden and Yalden 1990), disrupt breeding displays (Baydack 1986), disrupt foraging activity in shorebirds (Hoopes 1993), and disturb roosting activity in ducks (Keller 1991). For mule deer in Colorado, the presence of a dog resulted in a greater area of influence, alert and flush distance, and distance moved than when a pedestrian was alone (Miller et al. 2001). Many of these authors indicated that dogs with people, dogs on leash, or loose dogs provoked the most pronounced disturbance reactions from their study animals. Indirectly, domestic dogs can potentially introduce various diseases and transport parasites into wildlife habitats (Sime 1999).

### Refuge-specific Impacts

This section evaluates the likely impact at the Refuge, considering the scientific studies discussed above and considering the uses within the context of Malheur Refuge.

Over 130 species of birds nest in the Refuge, and unusual or rare birds, particularly passerines, can often be seen during the spring migrations. Malheur Refuge provides some of the most significant habitat and resources for migratory birds on the Pacific Flyway. If not adequately protected, especially during the migration and nesting seasons, bird populations could be impacted by regular disturbance and flushing from feeding, resting, or nesting areas.

***Loss of Habitat from Facility Construction:*** Under Preferred Alternative 2, new facilities constructed for wildlife observation, photography, and interpretation, as well as facilities supporting welcome and orientation, would result in 10 acres of habitat loss, which is a fraction of a percentage of the Refuge. A large number of facilities would be associated with already developed sites, but as a result of enhanced opportunities in the P Ranch Unit, in particular, a majority of the habitat loss (approximately 6.5 acres) would be associated with wet meadow habitat. Overall, habitat loss from new facilities is considered negligible across the landscape.

***Vegetation, Soil, and Water Impacts:*** Pedestrian access to the Refuge creates the highest potential for direct disturbance or damage to vegetation and soil, as foot travel associated with these uses could potentially result in temporary or minor vegetation trampling and soil compaction. People can also be vectors for invasive plants by moving seeds from one area to another. The threat of invasive plant establishment will always be an issue requiring regular monitoring and treatment. However, under Preferred Alternative 2, self-guided visitor access for wildlife observation, photography, and interpretation would be limited to roads, 18 miles of trails, and developed sites. No impacts from these uses are expected to water resources. Habitat and soil impacts related to horseback riding would be minor, as the use is mostly incidental and occurs at very small numbers (<5 visits a year). Horseback riding is limited to Center Patrol Road.

In addition to the self-guided opportunities along trails, roads, and developed sites, the Refuge would offer up to 20 docent-led tours a year to areas that may be away from established public roads or trails, including tours for special events. Docent-led tours may create potential for additional impacts to vegetation and soil, but limitations on group size, the likelihood that tours will visit a variety of different locations over time, and the relatively infrequent offerings of these types of visits mean that the likely impacts to soils and vegetation would be minor within the context of the Refuge as a whole.

***Disturbance-related Impacts:*** Many of the studies noted above analyze disturbance impacts to wildlife from human presence. However, at Malheur Refuge, visitors most often access and explore the Refuge by vehicle, thus minimizing pedestrian disturbance to resources, which as noted above, can be larger than disturbance from vehicles. Vehicles act as a blind, shielding wildlife from humans, and the Refuge encourages this practice in their visitor brochure and in visitor interactions with volunteers and staff. Center Patrol Road allows visitors to see a diversity of habitats and wildlife while largely concentrating the impacts of visitors to a single road through the Refuge. Given previously cited studies, wildlife tends to be most disturbed by human presence at distances less than 100 m (328 feet). Assuming a wildlife distance buffer zone of 200 m on all Refuge roads open to public use, the total impact of disturbance from visitors on open Refuge roads and trails is approximately 9,800 acres, or 5 percent of the Refuge. Disturbance to habitat would vary depending on the location of the road or trail, and, based on calculations, the majority of habitats that would be disturbed from Refuge roads and trails would be wet meadow at 28 percent, which includes a number of public use sites (salt desert scrub at 25 percent and sagebrush-steppe at 11 percent of total acreage disturbed). In the long-term, even if visitor numbers increase more than expected due to program and facility development, disturbance impacts from wildlife observation, photography, and interpretation would pose minimal impact to Refuge wildlife, because users would be concentrated on the designated roads, trails, and public facilities described above, leaving wildlife thousands of acres of undisturbed sanctuary.

***Impacts at Specific Sites:*** Docent-led tours would also include opportunities for group kayaking or canoeing on Malheur Lake, which has the potential to cause disturbance to wildlife using this resource and habitat, including sandhill cranes using the lake as a staging area in the fall migration season. Careful scheduling of the tours around sensitive wildlife seasons and resource areas, limiting the group size to a manageable and sustainable size, and providing public education to inform visitors of ethical and least intrusive methods to wildlife viewing and photography would reduce impacts.

Under Preferred Alternative 2, opportunities would also be expanded at Krumbo Reservoir for wildlife observation, including electric and non-motorized boating, outside of the fishing season,

except when the water ices over. Increasing access to the Reservoir could have potential impacts to birds during the winter nesting season at Krumbo Reservoir as well as Krumbo Swamp and Otter Pond along the Krumbo Access Road. The number of birds using the Reservoir during the winter is less than 400 birds on any given day and less than 100 birds during the coldest part of the season; most birds have migrated farther south during the winter. The Reservoir is 184 acres, which is less than 20 percent of the total 1,004 acres of available open water wintering habitat in this part of the Refuge, leaving at least 820 acres of open water for wintering bird use including Boca Lake, Benson Pond, and East or West Knox Pond. Additionally, the number of visitors to the Reservoir during the winter months would be significantly lower than in the spring, summer, or fall months. With the low number of birds present, low visitor use levels, and availability of additional wintering habitat and sanctuary, it is expected that year-round access at Krumbo Reservoir would have minor impacts. Wildlife surveys and monitoring would be conducted to ensure disturbance stays at a minimum.

***Pet Impacts:*** Pet impacts are expected to be minor in relation to wildlife observation, photography, and interpretation use, since all pets must be kept leashed and stay on designated public use roads and trails while on the Refuge. Horses must also stay on public use roads.

***Impacts to Listed Species:*** There are no listed or endangered species on the Refuge. Greater sage-grouse (*Centrocercus urophasianus*) and the Great Basin Columbia spotted frog (*Rana luteiventris*) are designated as Federal candidate species for listing under the Endangered Species Act. Incidental post-breeding observations of sage-grouse have been made in recent years in the southeast portion of the Blitzen Valley. Spotted frogs have been documented in limited areas on the Refuge (Engle 2001; Pearl et al. 2010; Rombough and Engler 2010; Oregon Department of Fish and Wildlife [ODFW] 2011). It is unclear at this time if the Refuge population is part of the Great Basin distinct population, which is the Federal candidate species or if they belong to the Oregon population.

Although the Refuge has occurrences of these candidate species, it is anticipated that impacts from wildlife observation, photography, and interpretation uses and facilities would be negligible. These uses would continue to occur at public sites and on designated roads and trails, away from sensitive habitat and resources and outside of breeding areas and seasons. The greater sage-grouse is not known to breed on the Refuge. Incidental use of the east side of the south Blitzen Valley by sage-grouse has been reported during the late summer when visitor numbers and activities are lower. Wildlife observation, photography, and interpretation uses would be minimal in the areas of Mud and Bridge Creek, where frog populations are known to occur and thus would not impact the spotted frog populations. If uses result in unacceptable adverse effects to candidate species or habitats, the Refuge would impose restrictions to mitigate disturbance.

***Impacts to Other Priority Public Uses:*** Wildlife observation, photography, and interpretation generally result in little disturbance to other visitors. Conflicts between hunters and these activities would be minimal due to the seasonal differences in uses. Hunting on the Refuge occurs at a time of year when visitors engaged in wildlife observation, photography, and interpretation are fewer in number. Under Preferred Alternative 2, hunting would be open on the southern portion of Malheur Lake at Boat Landing Road where docent-led kayaking or canoeing tours would also occur. To minimize safety conflicts between hunters and non-hunters, docent-led tours on the southern portion of Malheur Lake would occur prior to the hunting season so there is no overlap between uses. Other hunting areas are not open to self-guided wildlife observation, photography, or interpretation and thus this use should not conflict with hunting. There is no conflict expected between anglers or environmental education participants and wildlife observers or photographers.

**Infrastructure:** No significant effects to roads, trails, or other infrastructure from the wildlife observation, photography, and interpretation programs are foreseen. Normal road, trail, and facility maintenance would continue to be necessary. Additional facility construction or upgrade, if needed, is addressed in the Availability of Resources section.

### Public Review and Comment

Various opportunities were provided for the public to engage in the CCP planning process. Appendix J details public involvement undertaken during the development of the CCP/EIS. Written comments on this draft CD are welcome.

### Determination

<u>          </u>	Use is Not Compatible
<u>  X  </u>	Use is Compatible with the Following Stipulations

### Stipulations Necessary to Ensure Compatibility

- Visitors would be restricted to designated trails, sites, or facilities as determined by Refuge staff. Use is open daily from dawn to dusk. Camping, overnight use, swimming, and fires would be prohibited.
- Motorized vehicles, bicycles, horseback riding, and cross-country skiing would be authorized on Center Patrol Road and Krumbo Lane, and vehicles must observe posted speed limits.
- Pets must be kept leashed while on the Refuge, and would be only permitted on open Refuge roads. Pet owners would be expected to clean up after their pets and properly dispose of any waste.
- The Refuge would require advance reservations for groups in need of staff and volunteer participation to avoid conflicts with other groups and management activities.
- Docent-led tours would be limited to 20 tours a year and 15 participants maximum per group. All tours would be led by Refuge staff or qualified volunteers. Tour-goers would be instructed to stay on-trail, in designated program boundaries, and observe extra precautions if visiting closed areas.
- Improved trail signage would be developed to inform and guide visitors on name, length, difficulty, and destination.
- Seasonal closure at Sodhouse Ranch would be maintained.
- Elevated observation platforms, overlooks, trails, and blinds may be constructed to help reduce negative visitor impacts to wildlife, soils, vegetation, and hydrology.
- Collection of natural objects, such as plants, animals, minerals, antlers, and cultural resources are prohibited.
- If disturbance to wildlife or damage to habitat reaches unacceptable levels, the Refuge would limit uses in areas where unacceptable impacts occur. Monitoring would be conducted to ensure that high-quality habitat for wildlife feeding, resting, and breeding is maintained.

### Justification

Wildlife observation, photography, and interpretation receive enhanced consideration in the CCP planning process, and are considered priority public uses when determined compatible. Although these activities can result in disturbance to wildlife, they would occur on a small percentage of Refuge acres. There is a sufficient amount of undisturbed habitat available to Refuge wildlife for

escape and cover, and wildlife populations will find sufficient food resources and resting places. The relatively limited number of individual plants and animals expected to be adversely affected will not cause wildlife populations to materially decline. The physiological condition and production of Refuge species will not be impaired, their behavior and normal activity patterns will not be altered dramatically, and their overall welfare will not be negatively impacted. Thus, allowing wildlife observation, photography, and interpretation to occur under the stipulations described above will not materially detract or interfere with the purposes for which the Refuge was established or the Refuge Mission. Wildlife observation, photography, and interpretation programs complement the Refuge Purpose, vision, and goals, and help fulfill the mission of the National Wildlife Refuge System.

### **Mandatory Reevaluation Date**

09/2027 Mandatory 15-year Reevaluation Date (for priority public uses)

### **NEPA Compliance for Refuge Use Decision**

X Environmental Impact Statement and Record of Decision

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**Signatures:**

Prepared by: \_\_\_\_\_  
(Signature) (Date)

Refuge Manager/  
Project Leader  
Approval: \_\_\_\_\_  
(Signature) (Date)

**Concurrence:**

Refuge Supervisor: \_\_\_\_\_  
(Signature) (Date)

Regional Chief,  
National Wildlife  
Refuge System: \_\_\_\_\_  
(Signature) (Date)

## B.2 Environmental Education Compatibility Determination

**RMIS Database Uses:** Environmental education (not conducted by Refuge System staff or authorized agents); Environmental Education (teaching teachers or group leaders); Environmental Education (teaching students)

**Refuge Name:** Malheur National Wildlife Refuge

### Establishing and Acquisition Authorities and Refuge Purposes

- “... a Refuge and breeding ground for migratory birds and other wild life ...” Executive Order 7106, dated July 19, 1935, as modified by Public Land Order 1511, dated September 24, 1957
- “... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act)
- “... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” 16 U.S.C. 742f(a)(4)
- “... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)
- “... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans ...” 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

### National Wildlife Refuge System Mission

The mission of 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” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd et seq.]).

### Description of Use

This CD examines environmental education (EE) on the Refuge as proposed under Preferred Alternative 2 of the draft CCP/EIS. This CD addresses on-site EE programs and educational programs associated with non-profits and educational institutions.

**Program Offerings:** EE at the Refuge is currently conducted on- and off-site and is led by Refuge staff and qualified volunteers. The on-site EE program has been formally correlated with Oregon State Educational Standards and with local school district curricula for elementary levels kindergarten through fifth grade, as well as secondary and university levels. Under Preferred Alternative 2, the program would continue with ongoing collaborative efforts with local and regional EE initiatives to facilitate on- and off- Refuge EE for over 500 students annually, with the focal audience of local first and third grade students.

In addition to supporting local schools, the Refuge would continue to support environmental education and natural resource-based programs on the Refuge led by a variety of non-profits and

educational institutions. Currently, these groups include: Audubon Society chapters; high schools; public and private universities; and community colleges. The same or similar organizations would be expected to continue to participate in EE on the Refuge. Under Preferred Alternative 2, non-profit groups and educational institutions would be required to apply for a special use permit before engaging in EE on the Refuge.

The off-site EE program would be associated with established events and special programs, and the Refuge would continue to participate in and support local, regional, and national events and education modules.

***Location of Use and Associated Facilities:*** The on-site program for local schools occurs outdoors at the Refuge Headquarters and inside the George Benson Memorial Museum. Under Preferred Alternative 2, an outdoor learning area and outdoor learning shelter at the Refuge Headquarters would be constructed to assist with existing EE program efforts, to provide the opportunity for more experiential learning, and to support EE programs during periods of inclement weather.

EE programs associated with non-profits and educational institutions occur on foot or in vehicles in areas open to the public, and use the same facilities as wildlife observation, photography, and interpretation programs. Due to the large size of the Refuge, these programs are mainly conducted in vehicles, with occasional stops at public sites to allow groups to observe and learn about wildlife outside the vehicle.

***Number of Visits and Seasonal Patterns:*** An estimated 700 visits per year are made to the Refuge currently by local students for EE programs. EE for local students is currently facilitated by Refuge staff. EE activity conducted for non-local visitors (mostly adult visitors) is estimated to total approximately 6,700 visits per year. Most of the non-local EE is thought to be facilitated through universities, Malheur Field Station, or other non-profit groups. Based on past history, the majority of classes would be expected to visit the Refuge between April and June (spring migration season) under Preferred Alternative 2, although the classes may visit at any time of year. Groups may include up to 100 students. Class visits would be rotated to spread out the visits across different days and throughout the season to reduce the number of students on the Refuge at one time.

Non-profit groups and educational institutions would continue to conduct programs during the spring and fall migrations to make the most of the opportunity to observe and experience the wide variety of wildlife on the Refuge. Educational institutions occasionally bring groups during the summer for special programs, like geology and field biology classes. Due to the long distances travelled by many of these groups to get to the Refuge, the programs associated with these groups are generally multi-day and occur over the weekend, with groups staying overnight off-Refuge.

As a result of continued emphasis on EE under Preferred Alternative 2, this use would be expected to grow over 15 years to 800 visits by local students and 9,000 visits by non-local persons per year.

### **Availability of Resources**

Availability of resources for administering and managing EE under Preferred Alternative 2 are detailed in Table B-3.

**Table B-3. Costs to Implement the Use**

<b>Category</b>	<b>One-time Expense (\$)</b>	<b>Annual Expense (\$/year)</b>
Construct outdoor EE shelter at Refuge Headquarters	\$80,000	\$1,000
Provide outdoor learning area at Refuge Headquarters	\$25,000	\$1,000
Administration and management of program (curriculum development, initiatives, special events, coordination)		\$14,000
Equipment and materials		\$2,000
<b>Total</b>	<b>\$105,000</b>	<b>\$18,000</b>

The EE program works closely with area schools and regional and statewide partners to teach and engage students of all ages on Refuge resources, both on-site and off-site. The Refuge has one FTE position dedicated to the EE program as a Visitor Services Manager. Additional Refuge staff supports topic-specific programs like carp awareness and cultural resources. Other Refuge staff assists in maintenance of EE facilities; the EE program uses many of the same facilities and resources as the wildlife observation, photography, and interpretation program, including trail and parking area maintenance, facility and road maintenance, sign posting, and construction projects (USFWS 2011).

Some EE projects may currently lack funding, but the Refuge would develop partnerships and seek additional funding resources over the next 15 years as necessary to complete projects. Based on the availability of resources, the Refuge would have sufficient funds for managing current and expected levels of the EE program. Exact costs will be developed during design and implementation.

**Anticipated Impacts of the Use**

General Impacts Expected from the Scientific Literature

A general assessment of impacts resulting from EE uses has been compiled from the literature and is briefly summarized below.

**Disturbance Impacts:** In general, impacts that could occur from EE programs would be similar to those expected from wildlife observation, photography, or interpretation activities, especially those expected from larger groups using the site (USFWS 2011). Such impacts would be expected to include temporary damage to vegetation resulting from trampling, disturbance to nesting birds, and disturbance to feeding or resting birds or other wildlife in the proximity. EE programs generally accommodate groups of participants, and studies have shown that increasing group size has an impact on wildlife (Beale and Monaghan 2004; Remacha et al. 2011). In addition to group size, loudness has also been found to be an important variable to disturbance of wildlife, and loudness of people present can be more important than the number of people present (Burger and Gochfeld 1991). Studies showed that reducing group size, allowing safe distances, and reducing noise levels help minimize negative impacts on wildlife (Burger and Gochfeld 1991; Beale and Monaghan 2004; Remacha et al. 2011).

An unpublished study examined the effect of EE site activities at Blackhorse Lake on the Turnbull National Wildlife Refuge (Jose 1997). The study was designed to compare waterfowl presence and

behavior patterns between the times EE activities were occurring and the times when EE classes were not on-site. The study results indicated that fewer waterfowl were present in the study area when EE classes were on-site as compared to the control times. The study also found more shore flights undertaken by birds when EE classes were on-site. Redheads displayed the highest number of flight responses, followed by mallards. Ruddy ducks almost never flew but had the highest increase in directional swimming away from the EE classes. The study recommended that sites heavily used by smaller-bodied birds, such as ruddy ducks, buffleheads, and teals, not be used as EE sites.

**Conservation Benefits:** EE provides indirect beneficial impacts for visitors engaged in EE programs and activities. One study found that animal-oriented activities have an impact on the knowledge and attitudes of students involved in EE. Direct instruction methods in which children examined the anatomical and behavioral characteristics of live spiders and snakes promoted a positive attitude toward these animals (Kress 1975; Kellert and Westervelt 1983). Eighth graders engaged in wildlife-oriented activities were found to be more likely to recognize the importance of lower forms of animal life and preserving endangered species, and to have greater tolerance for predators (LaHart 1978). Another study concluded, “If one were to try to change attitudes, education without an experiential component might not be very effective” (Baird and Tolamn 1982, p. 12).

### Refuge-Specific Impacts

This section evaluates the likely impact at the Refuge itself, considering the scientific studies discussed above and considering the uses within the context of Malheur Refuge.

**Loss of Habitat from Facility Construction:** Under Preferred Alternative 2, new facilities constructed for EE would result in 0.25 acre of habitat loss, which is a fraction of a percentage of the Refuge; thus, habitat loss from new facilities is considered negligible.

**Vegetation, Soil, and Water Impacts:** Collection of resource samples for study (i.e., mud, water, plants) would be primarily focused at the Refuge Headquarters, and samples would be used on-site. Collection would be of materials needed to enhance hands-on learning and investigation and would be designed as part of structured activities and lessons guided by teachers and Refuge staff and volunteers. These activities would be an integral part of the EE philosophy, and their impacts would be considered minimal. Some additional trampling would also occur from larger group sizes, but impacts would be concentrated at public sites. To minimize trampling along the east side of the Display Pond, a hardened site may be developed. Impacts to water resources are expected to be negligible.

**Disturbance Impacts:** Under Preferred Alternative 2, the construction of an outdoor learning area and shelter at the Refuge Headquarters would have short-term disturbance impacts. Maintenance of facilities and equipment related to EE could also result in very local disturbance depending on time and place of need.

Disturbance to wildlife could occur from EE programs, as with any group, if birds near EE activities would be disturbed by human presence. The EE program would continue to be small, and would generally support groups of 10 to 30 participants at any one time, although occasionally multiple groups visit the Refuge at the same time. A special use permit (SUP) would be required for EE programs on the Refuge to ensure groups understand Refuge regulations, the purpose and mission of the Refuge and Refuge System, and to help the Refuge gather use information. For special permission into closed habitat/wildlife areas, an SUP would be required, and would be approved on a

case-by-case basis. All participants involved in EE would be instructed in ethical wildlife observation etiquette to view wildlife with minimal disturbance.

Table B-4 details the SUP requirements under Preferred Alternative 2 for environmental education.

**Table B-4. Special Use Requirements for Environmental Education**

Access to Open Areas	Access to Closed Areas	Access to Hunting Areas	Access to Fishing Areas
<ul style="list-style-type: none"> <li>• Special use permit</li> <li>• No fee</li> </ul>	<ul style="list-style-type: none"> <li>• Special use permit</li> <li>• No fee</li> </ul>	<ul style="list-style-type: none"> <li>• No entry during hunting season</li> </ul>	<ul style="list-style-type: none"> <li>• Special use permit</li> <li>• No fee</li> </ul>
<ul style="list-style-type: none"> <li>• Special use permit</li> <li>• No fee</li> </ul>	<ul style="list-style-type: none"> <li>• Special use permit</li> <li>• No fee</li> </ul>	<ul style="list-style-type: none"> <li>• No entry during hunting season</li> </ul>	<ul style="list-style-type: none"> <li>• Special use permit</li> <li>• No fee</li> </ul>

Participation in EE programs is growing throughout Oregon, with the Service’s *Connecting People with Nature* initiative, and nationally with the *America’s Great Outdoors* initiative. With this growing emphasis, future program participation and associated effects would be expected to be higher than present. The EE program could have increased impacts on Refuge habitats and wildlife, but a majority of EE activities would be conducted at the Headquarters or along roads and trails open to the public.

It is not expected that EE would cause any additional short-term, long-term and/or cumulative and indirect/secondary impacts other than those detailed above.

**Impacts to Listed Species:** There are no listed or endangered species on the Refuge. Greater sage-grouse (*Centrocercus urophasianus*) and the Great Basin Columbia spotted frog (*Rana luteiventris*) are designated as Federal candidate species for listing under the Endangered Species Act. Incidental post-breeding observations of sage-grouse have been made in recent years in the southeast portion of the Blitzen Valley. Spotted frogs have been documented in limited areas on the Refuge (Engle 2001; Pearl et al. 2010; Rombough and Engler 2010; ODFW 2011). It is unclear at this time if the Refuge population is part of the Great Basin distinct population, which is the Federal candidate species or if they belong to the Oregon population.

Although the Refuge has occurrences of these candidate species, it is anticipated that impacts from EE uses and facilities would be negligible. These uses would continue to occur at public sites and on designated roads and trails, away from sensitive habitat and resources and outside of breeding areas and seasons. The greater sage-grouse is not known to breed on the Refuge. Incidental use of the east side of the south Blitzen Valley by sage-grouse has been reported during the late summer when visitor numbers and activities are lower. EE uses do not generally occur at Mud Creek and Bridge Creek outside of the fishing season and thus would not impact the spotted frog populations. Groups participating in EE on the Refuge would be required to apply for an SUP, and stipulations for reducing impacts to candidate species would be further covered by the permit. EE would also assist in raising awareness and preventing undue impacts to these species. If the use results in unacceptable adverse effects to candidate species or habitats, the Refuge would impose restrictions to mitigate disturbance.

**Impacts to Other Priority Public Uses:** EE generally results in little disturbance to other visitors. Some additional crowding at the Refuge Headquarters or along public roads and trails may occur

with EE groups, but the EE programs would consist of structured activities and would be carefully scheduled to ensure groups are spread out and not impacting other programs or events.

**Infrastructure:** No significant effects to roads, trails, or other infrastructure from EE programs are foreseen. Normal road, trail, and facility maintenance would continue to be necessary. Additional facility construction or upgrade is addressed in the Availability of Resources section.

### **Public Review and Comment**

Various opportunities were provided for the public to engage in the CCP planning process. Appendix J details public involvement undertaken during the development of the CCP/EIS. Written comments on this draft CD are welcome.

### **Determination**

Use is Not Compatible  
 Use is Compatible with the Following Stipulations

### **Stipulations Necessary to Ensure Compatibility**

#### ***Special Use Permit***

- An SUP would be required for groups engaging in EE on the Refuge. No fee would be charged for EE groups.
- A standard permit form stipulating dates, times, and locations of use would be made available prior to the visit on the Refuge’s website or by mail.
- SUPs for areas open to the public grant permissions to open areas for up to 1 year under the same use stipulations before renewal.
- Special permission requests to closed habitat/wildlife areas or other special considerations (e.g., access to Refuge after normal public visitation hours, setting up temporary equipment, requiring additional resources or staff) would be granted on a case-by-case basis with no renewal.
- The SUP is required to be readily available while conducting the permitted use on the Refuge.
- Requests must demonstrate intent to enhance education, appreciation, and/or understanding of the Refuge and the National Wildlife Refuge System. Failure to abide by any part of the SUP or regulations would be considered grounds for immediate revocation of the permit and could result in denial of future permit requests.

#### ***General Stipulations***

- On-site EE programs would be conducted at Refuge Headquarters or along roads and trails open to the public.
- Class size would be limited to 30 participants at a time.
- Refuge staff would instruct all groups in behavior etiquette and ways to reduce wildlife and habitat disturbance during a “welcome” session.
- Collection of resource samples for study (i.e., mud, water, plants) would be restricted to the Refuge Headquarters, and samples would be used on-site. Collection would be of materials

needed to enhance hands-on learning and investigation and would be designed as part of structured activities and lessons.

- Periodic monitoring and evaluation of Refuge Headquarters and EE programs would be conducted to assess if objectives are being met and the resource is not being unacceptably degraded.

### **Justification**

EE receives enhanced consideration in the CCP process, and is considered a priority public use when determined compatible. By limiting the size of groups, providing structured activities, and providing closed areas for wildlife away from human disturbance, this program would limit disturbances to wildlife. There is sufficient undisturbed habitat available to Refuge wildlife for escape and cover, and wildlife populations will find sufficient food resources and resting places. The relatively limited number of individual plants and animals expected to be adversely affected will not cause wildlife populations to materially decline, the physiological condition and production of Refuge species will not be impaired, their behavior and normal activity patterns will not be altered dramatically, and their overall welfare will not be negatively impacted. The use of SUPs allows the Refuge Manager to continually adjust the activity to any significant new or changing conditions on the Refuge as needed, and to facilitate outreach and coordination of activities with EE groups. Thus, allowing EE to occur under the stipulations described above will not materially detract or interfere with the purposes for which the Refuge was established or the Refuge System mission.

EE contributes to the mission of the Refuge System by providing wildlife-oriented educational benefits to visitors. EE programs on Refuge lands are inherently valuable to the USFWS because they will enhance the public's knowledge of the Refuge and its resources, and expand the number of visitors who engage in the Refuge's conservation mission. EE on-site and off-site is an important part of the Refuge's vision and goals.

### **Mandatory Reevaluation Date**

09/2027 Mandatory 15-year Reevaluation Date (for priority public uses)

### **NEPA Compliance for Refuge Use Decision**

X Environmental Impact Statement and Record of Decision

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**Signatures:**

Prepared by: \_\_\_\_\_  
(Signature) (Date)

Refuge Manager/  
Project Leader  
Approval: \_\_\_\_\_  
(Signature) (Date)

**Concurrence:**

Refuge Supervisor: \_\_\_\_\_  
(Signature) (Date)

Regional Chief,  
National Wildlife  
Refuge System: \_\_\_\_\_  
(Signature) (Date)

## B.3 Waterfowl Hunting Compatibility Determination

**RMIS Database Use:** Hunting (waterfowl)

**Refuge Name:** Malheur National Wildlife Refuge

### Establishing and Acquisition Authorities and Refuge Purposes

- “... a Refuge and breeding ground for migratory birds and other wild life ...” Executive Order 7106, dated July 19, 1935, as modified by Public Land Order 1511, dated September 24, 1957
- “... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act)
- “... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” 16 U.S.C. 742f(a)(4)
- “... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)
- “... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans ...” 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

### National Wildlife Refuge System Mission

The mission of 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” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd et seq.]).

### Description of Use

**Program Offerings:** This CD examines waterfowl hunting on designated units of the Refuge as proposed under Preferred Alternative 2 of the draft CCP/EIS. Under this alternative, the Refuge would offer waterfowl hunting in two units: the Malheur Lake Unit and the Buena Vista Unit. The total waterfowl hunt area under Preferred Alternative 2 would measure approximately 63,100 acres or 33 percent of the Refuge. Staggered hunt openings would provide the equivalent of two “opening weekends” at the Refuge.

A youth waterfowl hunt would be promoted, and the Refuge would support reasonable waterfowl hunting opportunities in the Buena Vista Unit for disabled hunters. Species available for take include ducks, geese, and coots. To increase hunter success during the hunting season, the use of well-trained hunting dogs would be encouraged by the Refuge for prey retrieval.

### Location of Use, Associated Facilities, and Access:

**Malheur Lake Unit:** Malheur Lake Unit is currently located on the north side of Malheur Lake, east of Highway 205 and west of Cole Island Dike (approximately 26,000 acres or 14 percent of the Refuge).

Under Preferred Alternative 2, the allowable hunt area on the lake would be expanded to include an area on the south side of Malheur Lake east of the Sodhouse Farms (a private inholding) eastern dike and west of Cole Island Dike (approximately 4,600 acres), creating two hunt units on the lake: the North Malheur Lake Unit and the South Malheur Lake Unit. The opening on the North Malheur Lake Unit would remain the same as the state waterfowl season, which is generally from the end of September to mid-October. Access would be improved to the North Malheur Lake Hunt Unit by refurbishing the Saddle Butte lake access with an all-weather road. Existing walk-in access from Highway 205 and the Lawen access would remain. The north hunt boundary would be redefined to reflect the actual huntable acreage west of Cole Island Dike, and to protect significant resources on Malheur Lake.

The South Malheur Lake Unit would have special date regulations from the fourth Saturday of October to the end of the regular state waterfowl season and would include a fourth access point at the airboat launch site near Refuge Headquarters with expanded parking and a refurbished boat launch. A no-hunt buffer zone around the airboat launch site and proposed observation tower would be enforced. This would bring the North and South Malheur Lake Units to a total of 27,100 acres under Preferred Alternative 2. See Map 3b.

*Buena Vista Unit:* The Buena Vista Hunt Unit, currently open only for upland game hunting, would also be opened to waterfowl hunting under Preferred Alternative 2, adding 36,000 acres of waterfowl hunt area to the waterfowl hunt program. A special date regulation would apply from the fourth Saturday of October to the end of the regular state pheasant season. Boats would not be permitted in this hunt unit; however, the hunt unit would provide a walk-in hunting experience where hunters could set up temporary decoys or jump-shoot if opportunities present themselves.

Like other Refuge users, hunters rely on roads, parking lots, pull-offs, trails, and dikes while using the Refuge.

*Number of Visits and Seasonal Patterns:* In 2010-2011, an estimated 85 visits were made to the Refuge to engage in waterfowl hunting activities. Waterfowl hunting is the smallest use of all the priority public uses on the Refuge. With improvements made to habitat management, access, and enhanced hunting opportunities, the number of waterfowl hunting visits is expected to grow over 15 years to 180 visits per year.

**Availability of Resources**

Availability of resources for administering and managing the waterfowl hunting program under Preferred Alternative 2 are detailed in Table B-5.

**Table B-5. Costs to Implement the Use**

Category	One-time Expense (\$)	Annual Expense (\$/year)
Improve Saddle Butte access road	\$130,000	
Open new ADA-accessible boat launch and parking area on Malheur Lake at the end of Boat Landing Road	\$150,000	
Develop new publications and signage for hunt program	\$2,000	\$1,000

**Table B-5. Costs to Implement the Use**

<b>Category</b>	<b>One-time Expense (\$)</b>	<b>Annual Expense (\$/year)</b>
Staff administration and management (programmatic, law enforcement, regulations, and information)		\$5,000
Facility maintenance		\$2,000
<b>Total</b>	<b>\$282,000</b>	<b>\$8,000</b>

Administering the waterfowl hunt program does not require significant staff time, equipment, or funding. Still, to maintain a quality hunting experience, access trails, parking lots, signs, and other facilities are maintained annually. The Refuge has one FTE Visitor Services Manager and one FTE position for law enforcement that patrols the Refuge during hunting season to ensure compliance with Federal, state, and Refuge conditions. The majority of the staff time spent administering this program would fall mostly on the law enforcement position. Other Refuge staff assists in maintenance of hunting facilities like access roads and parking lots; in general, the waterfowl hunt program uses many of the same facilities and resources as the wildlife observation, photography, and interpretation program, including trail and parking area maintenance, facility and road maintenance, sign posting, and construction projects (USFWS 2011). Additional costs and staff time would include updating and printing hunting brochures and developing new publications for the hunt program.

Some hunt program enhancements may currently lack funding, but the Refuge would develop partnerships and seek additional funding resources over the next 15 years as necessary to complete projects. Based on the availability of resources, the Refuge would have sufficient funds for managing current and expected levels of waterfowl hunting. Exact costs will be developed during design and implementation.

**Anticipated Impacts of the Use**

General Impacts Expected from the Scientific Literature

A general assessment of impacts resulting from waterfowl hunting uses has been compiled from the literature and is briefly summarized below.

**Direct Impacts to Hunted Wildlife:** Sport hunting involves the direct take of wildlife designated as huntable game species by regulation. In addition to loss of target individuals, additional birds are sometimes crippled or killed and not retrieved.

Hunting causes disturbance to feeding and resting waterfowl as well as non-target species due to noise (shotgun), movement, vehicular traffic, and use of dogs for hunting activities. It can also alter behavior, population, structure, and distribution patterns of wildlife (Owens 1977; Raveling 1979; White-Robinson 1982; Thomas 1983; Bartlet 1987; Madsen 1985; Cole and Knight 1990; Dooley et al. 2010). Disturbance levels from hunting activity outside Chincoteague NWR were found to be high enough to force wintering black ducks into a pattern of nocturnal feeding within surrounding salt marsh and diurnal resting within Refuge impoundments (Morton et al. 1989a, 1989b). Unhunted populations have been documented to behave differently from hunted ones (Wood 1993). Although disturbance from hunting is noted to have effects directly on wildlife, the U.S. Department of the

Interior (U.S. DOI) concluded that hunting disturbance has less of an impact compared to the direct mortality caused by hunting (2009).

There appears to be an inverse relationship between the number of birds using an area and hunting intensity (DeLong 2002). In California, the number of northern pintails on Sacramento NWR non-hunt areas increased after the first week of hunting and remained high until the hunt season was over in early January (Heitmeyer and Raveling 1988). Following the close of hunting season, ducks generally increased their use of the hunt area; however, use was lower than before the beginning of the hunting season. Prolonged and extensive disturbances may cause large numbers of waterfowl to leave disturbed areas and migrate elsewhere (Madsen 1995; Paulus 1984).

Sanctuaries or non-hunt areas have been identified as the most common solution to disturbance problems caused by hunting (Havera et al. 1992). In Denmark, hunting disturbance effects were experimentally tested by establishing two sanctuaries, and over a 5-year period, these sanctuaries became two of the most important staging areas for coastal waterfowl; numbers of dabbling ducks and geese increased 4- to 20-fold within the sanctuary (Madsen 1995).

***Disturbance from Dogs:*** Dogs elicit a greater response from wildlife than people on foot alone (MacArthur et al. 1982; Hoopes 1993). The presence of dogs may disrupt foraging activity in shorebirds (Hoopes 1993) and disturb roosting activity in ducks (Keller 1991). Many of these authors indicated that dogs with people, dogs on leash, or loose dogs provoked the most pronounced disturbance reactions from their study animals. In effect, off-leash dogs increase the radius of human recreational influence or disturbance beyond what it would be in the absence of a dog. Indirectly, domestic dogs can also potentially introduce various diseases and transport parasites into wildlife habitats (Sime 1999).

### Refuge-specific Impacts

This section evaluates the likely impact on Refuge resources specifically, considering the scientific studies discussed above and considering the use within the context of Malheur Refuge. It also considers the cumulative effect of Refuge hunts on regional and flyway populations of target species.

NEPA considerations by the Service for hunted migratory game bird species have been addressed nationally. In August 2009, a *Draft Supplemental Environmental Impact Statement: Issuance of Annual Regulations Permitting the Hunting of Migratory Birds* (hereafter abbreviated as SEIS 2009) was released (U.S. DOI 2009). Annual NEPA considerations for waterfowl hunting frameworks are covered under a separate Environmental Assessment and Finding of No Significant Impact.

***Harvest Management—Regulatory Procedures:*** The hunting of waterfowl in the United States is based upon a thorough regulatory setting process that involves numerous sources of waterfowl population and harvest monitoring data. Waterfowl populations throughout the United States are managed through an administrative process known as flyways, of which there are four (Pacific, Central, Mississippi, and Atlantic). Oregon is included in the Pacific Flyway. A review of the policies, processes, and procedures for waterfowl hunting is covered in a number of documents.

Because the Migratory Bird Treaty Act stipulates that all hunting seasons for migratory game birds be closed unless specifically opened by the Secretary of the Interior, the Service annually promulgates regulations (50 Code of Federal Regulations [CFR] 20) establishing the Migratory Bird Hunting Frameworks. The frameworks are essentially permissive, in that hunting of migratory birds

would not be permitted without them. Thus, in effect, annual Federal regulations both allow and limit the hunting of migratory birds.

The Migratory Bird Hunting Frameworks provide season dates, bag limits, and other options for states to select from, which should result in the level of harvest determined to be appropriate based upon Service-prepared annual biological assessments detailing the status of migratory game bird populations. In North America, the process for establishing waterfowl hunting regulations is conducted annually. In the United States, the process involves a number of scheduled meetings (Flyway Study Committees, Flyway Councils, Service Regulations Committee, etc.) in which information regarding the status of waterfowl populations and their habitats is presented to individuals within the agencies responsible for setting hunting regulations. In addition, public hearings are held and the proposed regulations are published in the Federal Register to allow public comment.

For waterfowl, annual assessments used in establishing the Frameworks include the Breeding Population and Habitat Survey, which is conducted throughout portions of the United States and Canada. This survey is used to establish an annual Waterfowl Population Status Report. In addition, the number of waterfowl hunters and resulting harvest are closely monitored through both the Harvest Information Program (HIP) and the Parts Survey (Wing Bee). Since 1995, such information has been used to support the adaptive harvest management (AHM) process for setting duck-hunting regulations. Under AHM, a number of decision-making protocols determine the choice (package) of pre-determined regulations (appropriate levels of harvest) that comprise the framework offered to states that year. Each state's wildlife commission then selects season dates, bag limits, shooting hours, and other options from the Pacific Flyway package. Their selections can be more restrictive, but cannot be more liberal than AHM allows. Thus, the level of hunting opportunity afforded each state increases or decreases each year in accordance with the annual status of waterfowl populations.

Season dates and bag limits for National Wildlife Refuges open to hunting are never longer or larger than the state regulations. In fact, based upon the findings of an environmental assessment developed when a Refuge opens a new hunting activity, season dates and bag limits may be more restrictive than the state allows. Each National Wildlife Refuge considers the cumulative impacts to hunted migratory species through the Migratory Bird Frameworks published annually in the Service's regulations on Migratory Bird Hunting.

**Population and Harvest Data:** The following analysis of hunting effects on the Refuge uses data on harvest and population, comparing the number of birds taken at various scales with the estimated population size. Since hunting occurs in the fall and winter, the mid-winter population index is used to compare take to population. The index is provided by the 2010 Pacific Flyway Data Book, which tracks waterfowl harvests and status, and hunter participation and success in the Pacific Flyway and United States (Collins and Trost 2010). The Pacific Flyway is one of the major north-south routes of travel for migratory birds in the Americas along the West Coast, and the Refuge is part of the flyway route. The data is provided at a variety of scales: Pacific Flyway, State of Oregon, and Survey Unit 69-3 S, which includes Klamath, Lake, and Harney counties, providing a good view of regional populations (Collins and Trost 2010). Although the Refuge receives the majority of its birds during the spring and fall migration months, the mid-winter index provides an example of bird populations that may be present regionally during the Refuge hunting season.

**Wintering Populations:** Recent mid-winter waterfowl survey counts for ducks and geese in the Pacific Flyway, the State of Oregon, and regional Survey Unit 69-3 S are presented in Table B-6.

These numbers only represent an index, not an absolute population number. Oregon hosts only a small percentage of wintering waterfowl; within the Pacific Flyway, the majority of waterfowl winter in California. At Malheur, the main wintering species include: Canada geese, mallards, common goldeneye, bufflehead, and common and hooded merganser; coots are smaller in number. Most waterfowl species migrate away from the Refuge by mid-November with peaks during October. The Refuge has a low number of wintering birds, usually less than 3,000 birds reported during counts. The mid-winter population index from the Pacific Flyway Council is not reported for Malheur Refuge.

**Fall Populations:** Counts were conducted on the Refuge during the 1970s to 1990s to gather information on fall use days of ducks and geese. Between 1975 and 1981, the counts captured ducks and geese on Malheur Lake only; counts were Refuge-wide between 1982 and 1990, which assumed 90 percent of fall use still on Malheur Lake. From 1991 to 1997, counts did not specify location of populations, so it is hard to determine if they represent Malheur Lake, Harney Lake, or Refuge-wide counts, and thus do not provide a reliable source. The fall population counts from the 1970s to 1990s represent population numbers from mid-September through mid-December on the Refuge. Although dated, the counts provide the best available data for fall bird populations over time on the Refuge. (Paullin et al. 1977; Horton et al. 1983; Littlefield 1983)

Area harvest information is not available at the regional or Refuge level, as it is not consistently tracked by the Pacific Flyway Council, ODFW, or the Refuge. The Pacific Flyway provides harvest data at the flyway, state, and regional levels. The Refuge harvest numbers are estimated by Refuge staff, but are only an estimate.

**Estimated Harvest Mortality:** Hunting results in mortality to waterfowl, and these numbers are tracked at different scales. See Table B-6 for harvest estimates at different scales in 2009. The estimated future harvest of ducks and geese on the Refuge due to hunting under Alternatives 1, 2, and 3 is also captured.

**Table B-6. Harvest and Population at Flyway, State, and Survey Unit Scales: Ducks, Geese<sup>1</sup>, and Coots**

Area	Area Harvest 2009	Breeding Population 2010	Mid-winter Population Index 2010	Average Fall Count 1982-1990 <sup>2</sup>	Estimated Harvest <sup>3</sup>		
					Alt. 1	Pref. Alt. 2	Alt. 3
<b>Ducks</b>					<b>Alt. 1</b>	<b>Pref. Alt. 2</b>	<b>Alt. 3</b>
Pacific Flyway	3,225,718	980,298	4,620,523		No change		
State of Oregon	422,001	219,876	349,654		No change		
Survey Unit 69-3 S <sup>4</sup>	Not available		14,173		No change		
Malheur NWR	Est. <100			25,593	<100	<250	<150
<b>Geese</b>					<b>Alt. 1</b>	<b>Pref. Alt. 2</b>	<b>Alt. 3</b>
Pacific Flyway	425,739		1,522,908		No change		
State of Oregon (total season)	60,901		125,447		No change		
Survey Unit 69-3 S <sup>3</sup>	Not available		13,024		No change		
Malheur NWR	Est. <150			6,253	<150	<200	<150
<b>Coots</b>					<b>Alt. 1</b>	<b>Pref. Alt. 2</b>	<b>Alt. 3</b>
Pacific Flyway	35,564		606,642		No change		
State of Oregon (total season)	2,124		13,585		No change		
Survey Unit 69-3 S <sup>3</sup>	Not available		100		No change		
Malheur NWR	Est. <50			Not available	<50	<100	<75

<sup>1</sup> Source: Collins and Trost 2010.

<sup>2</sup> From Refuge-wide population counts, averaged from available data from Harney Basin Study Reports.

<sup>3</sup> Klus 2001; Megan and Bodeen 2011.

<sup>4</sup> Survey Unit 69-3 S is a unit that the Pacific Flyway Council uses for mid-winter surveys that includes Klamath, Lake, and Harney counties, which includes Malheur Refuge.

Although in Table B-6, harvest in 2009 appears to represent more than the actual mid-winter survey for ducks at the state level, it is important to remember that to make any kind of comparison between the seasonal harvest and some population level, an estimate of the number of birds available for harvest in Oregon would be needed. The mid-winter count represents simply a snapshot at one point during mid-winter, and thus can underestimate total wintering populations. The duck harvest in Oregon accounted for approximately 13 percent of the Pacific Flyway duck harvest in 2009. Similarly, the goose harvest in Oregon accounted for approximately 14 percent of the Pacific Flyway goose harvest in 2009.

***Direct Mortality Stemming from Refuge Hunts:*** Refuge-specific harvest data is not available at this time, but per communication with Refuge staff and ODFW, hunter numbers and harvest numbers are generally very low and do not exceed more than 250 waterfowl harvested annually. With expanded access to the South Malheur Lake Unit and the opening of the Buena Vista Hunt Unit for waterfowl hunting under Preferred Alternative 2, the number of harvests would be expected to increase to 550 waterfowl annually. These estimated harvests represent a tiny fraction of a percent of the total mid-winter population of wintering waterfowl in the Survey Unit and State of Oregon, and an even smaller fraction of the Pacific Flyway population. Under Preferred Alternative 2 harvest estimation, the waterfowl harvested would be less than 2 percent of the mid-winter survey population in the Survey Unit 69-3 S (Klamath, Lake, and Harney counties). From available data provided in the Harney Basin Study Reports, the duck and goose harvested would be between 1 percent and 4 percent of fall counts at average 1982-1990 levels. Coot populations have been increasing over the last 50 years, from 600,000 birds in 1955 to 1.6 million birds in 2005. American coot harvest in Oregon during 2005 was 1,500 birds taken by 200 hunters. As the flyway coot population continues to remain high, these birds are underutilized and, with liberal bag limits, can provide increased hunting opportunity. The overall impacts from the harvest estimates would be minor to negligible.

Historical data demonstrates that Malheur Lake was once an extremely productive area for waterfowl, with annual waterfowl production estimates from 1942 to 1980 averaging over 51,000 birds, of which ducks constituted over 95 percent, or over 48,000 ducks produced annually. In 1948 alone, 146,950 ducks were produced (Cornely 1982), suggesting that these high levels of production resulted in high-quality waterfowl hunting. After 1980, population data is not readily available; however, Refuge staff believe production has been decreasing over the years due to lake level fluctuations and invasive carp. As management activities work to control carp in Malheur Lake over the next 15 years, it would be expected that the number of nesting birds in this area would increase and consequently the number of hunters and harvests would also increase. There are many unknowns in carp control, and an accurate estimate of waterfowl to be harvested under this scenario cannot be predicted at this time.

The Buena Vista Hunt Unit would considerably increase the acreage open to waterfowl hunting to 63,000 acres; however, the expected number of waterfowl hunters after opening weekend would be small, thus mitigating against hunter competition and disturbance issues. Additionally, spreading out opening weekend for waterfowl hunting between the hunt units over two weekends would help reduce conflicts between hunters and allows additional protection for staging sandhill cranes.

Given the small amount of the estimated take and the distribution of the hunt units, the hunt program as designed is not expected to adversely affect the Refuge's ability to sustain optimum population levels for maintaining populations of migratory waterfowl. As the health of Malheur Lake improves and the hunt program grows over the 15-year time frame of the CCP, the hunt program would be

revisited with ODFW guidance to determine what the appropriate level of harvest would be with growing population projections.

***Disturbance to Target Wildlife:*** Hunting could result in redistribution of waterfowl and waterbirds at the Refuge. Disturbance effects associated with hunting were examined in the SEIS 2009 for waterfowl and some other migratory bird species. On the basis of a review by Dahlgren and Korschgen (1992), the SEIS 2009 noted that disturbance has its most pronounced detrimental effect during the nesting period. Hence the SEIS 2009 noted that hunting-related disturbance does not have any pronounced population level effects (U.S. DOI 2009).

***Impacts to Non-Target Wildlife:*** Non-hunted wildlife would include any non-target waterfowl and other birds; small- and medium-sized mammals; reptiles; amphibians; and invertebrates. Occasionally, non-target species are illegally killed by hunters by accident or intentionally, or are disturbed by hunter presence or noise. The free-roam hunting opportunity and use of temporary blinds at the Buena Vista Unit could increase habitat disturbance in areas not currently accessed.

The cumulative effects of disturbance to non-hunted birds under the proposed action are expected to be moderate to minor for the following reasons. Hunter education courses are required for youths. Hunting seasons do not coincide with nesting seasons; thus, reproduction would not be reduced by hunting. Disturbance to the foraging or resting activities of migrating or resident birds might occur, and would increase with the new access for boats at the South Malheur Lake Unit and the opening of the Buena Vista Hunt Unit to waterfowl hunters. However, even with these changes, hunting is still expected to involve a small numbers of participants. On North Malheur Lake Unit, due to the long walk-in distances and difficulties and inconsistencies of getting boats out on the lake, many hunters hunt the shoreline rather than using boats on Malheur Lake, thus limiting the area disturbed on that side. The Buena Vista Unit would remain a walk-in hunt, but prohibiting overnight camping would decrease the likelihood of hunters roaming long distances in the Buena Vista Unit and other hunt units.

Waterfowl can be an important food resource for bald eagles in winter. On the Refuge, bald eagle presence is low during the winter, and the majority of the population is found during the spring. During waterfowl hunting season, there would be adequate food resources available on Malheur Lake and the wetlands for any bald eagles on the Refuge at this time. Furthermore, hunting pressure is generally low overall, and there would be no expected competition between hunters and bald eagles for waterfowl.

Disturbance to other taxa would be unlikely or negligible for the following reasons. Encounters with reptiles and amphibians, invertebrates, and small mammals in the early fall would be few and should not have cumulative negative effects on Refuge populations. Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles would be restricted to public roads and the harassment or taking of any wildlife other than the game species legal for the season would not be permitted.

Dogs would increase the level of disturbance to target and non-target species, but this impact is expected to be minor, especially to migratory wildlife, and is encouraged to support the use. Dogs would be required to be under the close control of their owners while on the Refuge.

Sandhill cranes stage on the southern portion of Malheur Lake and in the Buena Vista wetlands until mid-October. Under Preferred Alternative 2, a late season opener for the southern portion of Malheur

Lake and the Buena Vista Unit would allow sufficient protection of the sandhill cranes until they migrate south, thus mitigating any hunting-related impacts to sandhill cranes. Other birds using the area may be disturbed by noise and human presence; however, since most birds would have already migrated through the area by the time hunting begins, disturbance levels would be expected to be minor overall. Outreach with hunting brochures and timely information on the website would help educate hunters on hunting opportunities, regulations, and ethical hunter behavior.

**Loss of Habitat from Facility Construction:** Saddle Butte access road would be upgraded but would follow the same route. Construction of the boat launch at Boat Landing Road would result in 0.5 acre of habitat loss, which is a fraction of a percentage of the Refuge. Thus, habitat loss from new facilities is considered negligible. No additional new facilities would be added to support this use separate from general visitor use facilities described in the CD for wildlife observation, photography, and interpretation.

**Vegetation, Soil, and Water Impact:** Since access to waterfowl hunting areas is walk-in, associated foot travel from accessing Malheur Lake and the Buena Vista Unit for hunting could potentially result in temporary and minor vegetation trampling.

**Impacts to Listed Species:** There are no listed or endangered species on the Refuge. Greater sage-grouse (*Centrocercus urophasianus*) and the Great Basin Columbia spotted frog (*Rana luteiventris*) are designated as Federal candidate species for listing under the Endangered Species Act. Incidental post-breeding observations of sage-grouse have been made in recent years in the southeast portion of the Blitzen Valley. Spotted frogs have been documented in limited areas on the Refuge (Engle 2001; Pearl et al. 2010; Rombough and Engler 2010; ODFW 2011). It is unclear at this time if the Refuge population is part of the Great Basin distinct population, which is the Federal candidate species, or if they belong to the Oregon population.

Although the Refuge has occurrences of these candidate species, it is anticipated that impacts from waterfowl hunting uses and facilities would be negligible. The greater sage-grouse is not a hunted species on the Refuge. Hunting is not allowed south of the Buena Vista Unit where sage-grouse have been observed, and there have been no occurrences of spotted frogs in the area encompassed by the Buena Vista or Malheur Lake Hunt areas. Public education would assist in raising awareness and preventing undue impacts to these species. If uses result in unacceptable adverse effects to candidate species or habitats, the Refuge would impose restrictions to mitigate disturbance.

**Impacts to Other Priority Public Uses:** Hunting has the potential to disturb Refuge visitors engaged in other priority public uses; however, given the season during which hunting occurs, the likelihood of conflicts is low. The Malheur Lake airboat launch site near the Refuge would be opened to other uses during hunting season; however, the number of visitors to the Refuge during this season is drastically lower than in other seasons and hunting regulations would be established to provide a no-hunt buffer zone around the airboat launch site and observation tower. Although Center Patrol Road is the most popular attraction during the migration seasons, use is also very light during hunting season, and state regulations also prohibit shooting from, on, and across roads. Fishing along the Blitzen River from Sodhouse Lane to Boat Landing Road would conclude prior to the hunting season opening. Generally, winter use on the Refuge is only a fraction of the use during the spring and fall seasons.

**Infrastructure:** No significant effects to roads, trails, or other infrastructure from the hunting program are foreseen. Normal road, trail, and facility maintenance would continue to be necessary.

Additional facility construction or upgrade, if needed, is addressed in the Availability of Resources section.

**Other Effects:** There could be some indirect beneficial impacts of Refuge hunting. Refuge hunting can contribute to wildlife and habitat conservation and provide educational and sociological benefits. The hunting community in general remains the largest support base for funding land acquisitions in the Refuge System through the purchase of Duck Stamps. Waterfowl hunting at the Refuge is a “Big Six” use and helps meet the Refuge’s goals of wildlife-dependent recreation for all visitors. Additionally, providing youth hunting opportunities is an important initiative in the Fish and Wildlife Service, and enhancing this opportunity on the Refuge helps address a public desire to see more hunting opportunities for youth.

### **Public Review and Comment**

Various opportunities were provided for the public to engage in the CCP planning process. Appendix J details public involvement undertaken during the development of the CCP/EIS. Written comments on this draft CD are welcome.

### **Determination**

\_\_\_\_\_ Use is Not Compatible  
  X   Use is Compatible with the Following Stipulations

### **Stipulations Necessary to Ensure Compatibility**

- Only federally approved nontoxic shot may be used or be in possession while hunting on the Refuge.
- Vehicles would be allowed only on maintained public roadways. Parking would be allowed only within one vehicle length of the roadway. Hunters would be instructed to not block dike and field accesses.
- Overnight parking, camping, and campfires would not be permitted on the Refuge.
- Access would be walk-in only. Electric motorized boating or non-motorized boating would be permitted on Malheur Lake during the waterfowl hunt season.
- Hunting dogs are strongly encouraged to increase hunter success and retrieval rate. Dogs must be kept under close control.
- Seasonal hunting closures may occur to protect waterfowl populations when the Malheur Lake water level drops below 10,000 acres.
- Hunting closures would be in effect near Refuge Headquarters, Buena Vista Station, and the Malheur Field Station. Shooting from or across public roads or road right-of-ways is prohibited.
- Law enforcement patrols would ensure safety and minimize conflicts with other priority public uses by providing information about hunting boundaries and seasons to the general public and those using other Refuge programs. Information would be provided at interpretive kiosks, on the Refuge website, and in Refuge offices.

### **Justification**

Under the National Wildlife Refuge System Administration Act, as amended, waterfowl hunting is a wildlife-dependent recreational activity, which receives enhanced consideration in the CCP planning

process and is to be encouraged on National Wildlife Refuges if compatible with refuge purposes. Despite the direct and indirect impacts associated with sport hunting of waterfowl, waterfowl populations are unlikely to be affected significantly by the hunting program on the Refuge. Waterfowl population objectives and allowable harvests are determined on a flyway basis using an established annual regulatory process. Limited hunt seasons at the Refuge in significant wildlife areas, and no hunt zones, ensure that wintering and migrating waterfowl, as well as non-target species, will find adequate food and rest areas on the Refuge even in the midst of the hunting season. Thus, allowing waterfowl hunting to occur under the stipulations described above will not materially detract or interfere with the purposes for which the Refuge was established or the Refuge System's mission.

### **Mandatory Reevaluation Date**

09/2027 Mandatory 15-year Reevaluation Date (for priority public uses)

### **NEPA Compliance for Refuge Use Decision**

X Environmental Impact Statement and Record of Decision

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**Signatures:**

Prepared by: \_\_\_\_\_  
(Signature) (Date)

Refuge Manager/  
Project Leader  
Approval: \_\_\_\_\_  
(Signature) (Date)

**Concurrence:**

Refuge Supervisor: \_\_\_\_\_  
(Signature) (Date)

Regional Chief,  
National Wildlife  
Refuge System: \_\_\_\_\_  
(Signature) (Date)

## B.4 Upland Game Hunting Compatibility Determination

**RMIS Database Use:** Hunting (upland game)

**Refuge Name:** Malheur National Wildlife Refuge

### Establishing and Acquisition Authorities and Refuge Purposes

- “ ... a Refuge and breeding ground for migratory birds and other wild life ... ” Executive Order 7106, dated July 19, 1935, as modified by Public Land Order 1511, dated September 24, 1957
- “ ... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act)
- “ ... for the development, advancement, management, conservation, and protection of fish and wildlife resources ... ” 16 U.S.C. 742f(a)(4)
- “ ... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ... ” 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)
- “ ... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans ... ” 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

### National Wildlife Refuge System Mission

The mission of 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” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd et seq.]).

### Description of Use

**Program Offerings:** This CD examines sport hunting for upland game on designated units of the Refuge as proposed under Preferred Alternative 2 of the draft CCP/EIS (for more detail, see Hunt Plan, Appendix P). Under this alternative, the Refuge would offer upland game hunting in three units: the Malheur Lake Unit, the Buena Vista Unit, and the Boundary Hunt Unit.

The total acreage open to upland game hunting under Preferred Alternative 2 would be 49,000 acres, or 27 percent of the Refuge; however, regulations would vary by unit, as described below.

### *Location of Use, Associated Facilities, and Access:*

**Malheur Lake Unit:** Upland game hunting is currently open on the North Malheur Lake Unit, east of Highway 205 and west of Cole Island Dike. It currently measures 14,000 acres based on the average low water line of the lake. Current federal regulations ([50 CFR 32.56](#)) indicate that the Refuge allows hunting of pheasant, quail, partridge, chukar, and rabbit in accordance with State regulations, concurrent with the State pheasant season. Access is walk-in only from Lawen and Saddle Butte roads on the north side of the lake, and there is one access point on Highway 205 at the Narrows. Upland game hunting occurs on the edge of the lake and not on the actual lake itself.

Under Preferred Alternative 2, rabbit would be dropped from the species allowable; all other allowable species would remain the same. In addition, the boundary of the Malheur Lake Unit would be redefined to reflect the actual huntable acreage and to protect significant resources on the lake, reducing the unit to an average of 13,000 acres based on the typical low water line. Additionally, access would be improved by refurbishing the Saddle Butte lake access with an all-weather road. A youth upland game youth hunt would be promoted on the Malheur Lake Unit, on the State-designated weekend, generally in September each year. All other aspects of the hunt, including harvest season and other regulations, would remain the same. *Buena Vista Unit:* The Buena Vista Hunt Unit, which totals 36,000 acres, is one of the most popular hunting areas in Harney County for ring-necked pheasants. Federal regulations ([50 CFR 32.56](#)) indicate that the Refuge allows hunting of pheasant, quail, partridge, chukar, and rabbit within this Unit. The State season opens in mid-October, but the Buena Vista Hunt Unit currently has a later season opening to reduce conflicts with fall staging sandhill cranes.

Under Preferred Alternative 2, rabbit would be dropped from the species allowable; all other allowable species would remain the same. In addition, the opening date would change from the current third Saturday of November to the proposed fourth Saturday of October to provide more quality opportunities for upland game hunting earlier in the season while still ensuring a buffer for migrating sandhill cranes (sandhill cranes have usually migrated farther south by the middle of October). All other aspects of the upland game hunts would remain the same as they currently are.

*Boundary Hunt Unit:* The Boundary Hunt Unit includes the strip of land west of State Highway 205 and south of Foster Flat Road (2,122 acres), and an area bordering Krumbo Creek upstream of Krumbo Reservoir (504 acres). Both pieces of this unit border Bureau of Land Management (BLM) land. An uneven and generally unmarked boundary has contributed to difficulties in distinguishing the boundary between Refuge lands and BLM lands, so these areas have traditionally been managed to align with BLM hunt regulations (which conform to State regulations)<sup>1</sup>. Federal regulations ([50 CFR 32.56](#)) indicate that the Refuge allows hunting of “all upland game species” in the Boundary Unit section *west of Highway 205* during authorized State seasons; however, only deer and pronghorn are specifically mentioned in the regulations as allowable for this area, and the area identified for pronghorn and deer harvest includes only the western portion of the Boundary Unit (i.e., the Krumbo Creek area is excluded). Pheasant, quail, partridge, chukar, coyote, and rabbit are mentioned elsewhere in the regulations as upland game species available “in designated areas” but these areas are not described in the CFR. The Refuge has managed the hunt to include all of these species within the Boundary Unit.

State regulations define coyote and rabbit as predatory animals; coyotes are also defined as unprotected mammals. However, some rabbits are protected by the State and are not allowable for hunting.

Under Preferred Alternative 2, the Boundary Hunt Unit species allowable and areas would remain the same, with the following exceptions:

- Rabbit species allowable for take within this unit will be defined specifically as black-tailed jackrabbit (*Lepus californicus*) and Nuttall’s cottontail (*Sylvilagus nuttallii*).

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<sup>1</sup> State regulations do treat Federal refuges differently from other federal lands in at least one way. State rules (OR 635-050-0210) specifically bar hunting or trapping of fur-bearing mammals or unprotected mammals (both are defined in OR 635-050-0050) on “Federal refuges.”

- The Krumbo Creek area will be included as an area where deer and pronghorn may be hunted.

**Number of Visitors and Seasonal Patterns:** In 2010-2011, an estimated 850 visits were made to the Refuge to engage in upland game hunting activities in all three units, which accounts for over 90 percent of Refuge hunting visits. With improvements made to habitat management and access, and enhanced hunting opportunities, the number of upland game hunting visits is expected to grow over 15 years to 1,000 visits per year.

**Harvest Management:** Harvest and season regulations for upland game would be fully consistent with the State’s regulations, via ODFW’s *2010-2015 Upland Game Bird Hunting Season Framework* (ODFW 2010c). Hunting seasons and daily bag/possession limits have been established to maximize hunting opportunities over the next 5 years. The Refuge may manage under stricter, but not under more liberal, regulations. Note that trapping (an allowable method under State rules to take coyote and rabbit) would not be permitted under this CD.

**Availability of Resources**

Availability of resources for administering and managing the upland game hunting program under Preferred Alternative 2 are detailed in Table B-7.

**Table B-7. Costs to Implement the Use**

Category	One-time Expense (\$)	Annual Expense (\$/year)
Administration and management (programmatic, law enforcement, information)		\$2,000
<b>Total</b>	<b>\$0</b>	<b>\$2,000</b>

Administering the upland game hunt program does not require significant staff time, equipment, or funding. The Refuge has one FTE Visitor Services Manager and one FTE position for law enforcement that patrols the Refuge during hunting season to ensure compliance with state and Federal regulations and Refuge conditions. The majority of the staff time spent administering this program would fall mostly on the law enforcement position. Other Refuge staff assists in maintenance of general hunting facilities like access roads and parking lots that are included under the waterfowl hunt program (USFWS 2011a); in general, the upland hunt program uses many of the same facilities and resources as the wildlife observation, photography, and interpretation program, including trail and parking area maintenance, facility and road maintenance, sign posting, and construction projects (USFWS 2011b). Additional costs and staff time would include updating and printing hunting brochures and developing new publications for the hunt program.

Some hunt program enhancements may currently lack funding, but the Refuge would develop partnerships and seek additional funding resources over the next 15 years as necessary to complete projects. Based on the availability of resources, the Refuge would have sufficient funds for managing current and expected levels for upland game hunting. Exact costs will be developed during design and implementation.

## **Anticipated Impacts of the Use**

### General Impacts Expected from the Scientific Literature

A general assessment of impacts resulting from upland game hunting uses has been compiled from the literature and is briefly summarized below.

***Direct Impacts to Hunted Wildlife:*** Sport hunting involves the direct take of wildlife that are designated as huntable game species by regulation. In addition to loss of individual target species, additional birds are sometimes crippled or killed and not retrieved.

Hunting causes disturbance to feeding and resting waterfowl as well as non-target species due to noise (shotgun), movement, vehicular activity, and use of dogs for hunting activities. It can also alter behavior, population, structure, and distribution patterns of wildlife (Owens 1977; Raveling 1979; White-Robinson 1982; Thomas 1983; Bartlet 1987; Madsen 1985; Cole and Knight 1990; Dooley et al. 2010).

***Disturbance from Dogs:*** Dogs elicit a greater response from wildlife than people on foot alone (MacArthur et al. 1982; Hoopes 1993). The presence of dogs may disrupt foraging activity in shorebirds (Hoopes 1993) and disturb roosting activity in ducks (Keller 1991). Many of these authors indicated that dogs with people, dogs on leash, or loose dogs provoked the most pronounced disturbance reactions from their study animals. In effect, off-leash dogs increase the radius of human recreational influence or disturbance beyond what it would be in the absence of a dog. Indirectly, domestic dogs can also potentially introduce various diseases and transport parasites into wildlife habitats (Sime 1999).

### ***Species-specific Impacts: Upland Birds***

This section evaluates the likely impact on Malheur Refuge resources specifically, considering the scientific studies discussed above and considering the uses within the context of Malheur Refuge. It also considers the effect of Refuge hunts on target species.

***Population and Harvest Data:*** Population data of upland game birds is provided by ODFW through surveys of upland game bird production inventories. These inventories are typically conducted during the last half of July or the first half of August on established routes throughout Oregon. ODFW biologists record the species observed, the gender of birds observed (if possible), number of chicks observed, and number of chicks in complete broods, which produces a production index (number of chicks/adult). As they formulate an index and are not a full population sample, these survey techniques detect an unknown proportion of the population; consequently, the numbers cannot be used to provide an estimate of the total population. However, the data collected can be used to generate population trends, and the greater the increase in birds for a given year, the more likely ODFW biologists will be to count more birds (ODFW 2010a).

Harvest data of upland game birds is reported by hunters to ODFW annually, although harvest data at the Refuge level is not available. ODFW conducts annual harvest surveys to determine statewide hunter effort and take for upland birds. These surveys randomly select hunters for surveying and generally occur via telephone during hunting seasons. The hunters report by harvest unit, and Harney and Malheur counties are combined into one harvest unit, Area 7 (ODFW 2010b).

**Estimated Harvest Mortality:** The following analysis of upland bird game hunting uses data on population indices and harvests at a variety of scales. Species analyzed include ring-necked pheasants, California quail, and chukar partridge. Table B-8 captures ODFW’s upland game bird production inventories for 2004-2008 and 2009, and the 2009-2010 season upland game harvest data from the random telephone survey. The estimated harvest of upland game birds on the Refuge due to hunting under Alternatives 1, 2, and 3 is also captured.

Upland game bird populations can vary greatly from year to year, and the production indices only represent a proportion of known upland game birds. In 2009, the production indices for ring-necked pheasant, California quail, and chukar partridge were all near or above the previous 5-year average from 2004-2008, particularly pheasants and California quails (ODFW 2010a). This suggests that upland game bird populations are relatively stable.

Based on harvest data collected from ODFW’s annual telephone survey from the 2009-2010 season, upland game bird harvest in Harney and Malheur counties included 39 percent of pheasant hunted statewide, 42 percent of California quail hunted statewide, and 59 percent of chukar partridges hunted statewide. As the surveys are recorded by harvest unit, it is impossible to disaggregate the harvest information to determine the number of harvests in Malheur County or Harney County alone, or even at the Refuge level (Budeau 2011, personal communication). Based on the availability of habitat to support upland game birds in Malheur County, particularly pheasants, it is highly likely that a majority of upland game birds harvested in this unit are actually in Malheur County rather than Harney County, which the Refuge is located in (Budeau 2011, personal communication). Still, pheasants harvested in Harney County are most likely harvested on the Refuge because of the high quality of hunt available on the Refuge and the limited suitable habitat off-Refuge (Budeau 2011, personal communication). This pattern is likely true for other upland game birds too. Based on this information, the number of harvests at the Refuge-scale is expected to be considerably less than harvests reported at the harvest unit scale.

**Table B-8. Upland Game Bird Population Index and Estimated Harvest**

Area	Production Index (chicks/adult) 2004-2008 <sup>1</sup>	Production Index (chicks/adult) 2009 <sup>1</sup>	Number of Harvests 2009-2010 <sup>2,5</sup>	Estimated Refuge Harvest <sup>3</sup>		
				Alt. 1	Pref. Alt. 2	Alt. 3
<b>Ring-necked Pheasant</b>				<b>Alt. 1</b>	<b>Pref. Alt. 2</b>	<b>Alt. 3</b>
Oregon State	3.6	3.6	33,720	No change		
High Desert <sup>6</sup>	3.3	3.8		No change		
Harney County	1.5 <sup>4</sup>	0 <sup>4</sup>	12,989	No change		
Malheur NWR	Not available	Not available		<250	<300	<300
<b>California Quail</b>				<b>Alt. 1</b>	<b>Pref. Alt. 2</b>	<b>Alt. 3</b>
Oregon State	2.2	2.1	38,684	No change		
High Desert <sup>6</sup>	1.9	1.8		No change		
Harney County	2.5 <sup>4</sup>	4.2 <sup>4</sup>	16,165	No change		
Malheur NWR	Not available	Not available		<150	<200	<200

Area	Production Index (chicks/adult) 2004-2008 <sup>1</sup>	Production Index (chicks/adult) 2009 <sup>1</sup>	Number of Harvests 2009-2010 <sup>2,5</sup>	Estimated Refuge Harvest <sup>3</sup>		
				Alt. 1	Pref. Alt. 2	Alt. 3
<b>Chukar Partridge</b>						
Oregon State	2.4	2.7	57,628	No change		
High Desert <sup>6</sup>	2.0	2.1		No change		
Harney County	1.7 <sup>4</sup>	1.7 <sup>4</sup>	33,744	No change		
Malheur NWR	Not available	Not available		<75	<10 <sup>7</sup>	<10 <sup>7</sup>

<sup>1</sup> ODFW 2010a

<sup>2</sup> ODFW 2010b

<sup>3</sup> Klus 2011; Megan and Bodeen 2011

<sup>4</sup> Production index is for Harney County only.

<sup>5</sup> Number of harvests was reported for ODFW's Harvest Unit 7, which includes both Harney and Malheur counties combined.

<sup>6</sup> High Desert refers to the combined ODFW district/field offices for Mid-Columbia, Deschutes, Ochocho, Klamath, Lake, Harney, and Malheur.

<sup>7</sup> Chukar partridge hunt would essentially be eliminated on the Refuge due to the proposed transfer of the Boundary Hunt Unit to Bureau of Land Management.

Under Preferred Alternative 2, estimated harvest for upland game birds would not likely increase from current levels because the program would not markedly increase. An earlier season opening (extended hunt season overall) would provide additional hunting opportunities during the season and may increase hunters' harvest rates, but the harvest is small overall. The estimated Refuge harvest of <510 upland game birds would constitute about 1 percent of the entire harvest in Harney and Malheur counties based on 2009-2010 season. Given the wide range of upland game birds and 49,000 acres available to hunt on the North Malheur Lake Unit and Buena Vista Unit, it is expected that the overall upland game bird hunting pressure under Preferred Alternative 2 would be low; about 100 hunters come out for opening weekend and that number continues to drop throughout the season. Additionally, given the small number of the estimated take and the distribution of the hunt units, the hunt program as designed is not expected to adversely affect the Refuge's ability to sustain optimum population levels for maintaining populations of upland game birds.

Population-specific Impacts: Coyotes

Refuge-specific data on past coyote harvest are not available. According to a recent ODFW report (Hiller 2011), coyote populations have increased substantially in both abundance and distribution during the past several decades. Hiller further reports that southeastern Oregon leads harvest by both trappers and hunters, with Harney County having 486 coyotes taken by hunters and 276 coyotes taken by trappers in 2010 (Table B-9). However, by Oregon Revised Statute (ORS 610.002), coyotes are classified as predatory animals (which may be taken without permit, limits, or reporting on private lands); therefore, the report likely underestimates coyotes hunted or trapped for control purposes on private lands. In eastern Oregon, coyotes are the second-most common animal trapped, second only to muskrat (Hiller 2011).

**Table B-9. Reported 2010 Coyote Harvest on the Refuge, County, Region, and State**

Area	Trapping		Hunting	
	Number Reported as Taken	Percent of State Reported Harvest	Number Reported as Taken	Percent of State Reported Harvest
Refuge	Not allowable	0	Unknown <sup>1</sup>	Unknown
Harney County	276	9%	486	21%
Eastern Oregon	2,498	78%	1,997	83%
State of Oregon	3,220	100	2,277	100%

Source: Hiller 2011.

<sup>1</sup>Although the take rate is unknown, the Refuge law enforcement officer estimates that 10-12 hunters per year pursue coyote or rabbit within the Boundary Unit.

Gese (2005) examined a variety of coyote population parameter responses under exploitation and compared these with responses under no exploitation, as part of a 7-year study. In the experimental area, coyote removal rate was estimated at 44 percent to 61 percent and 51 percent to 75 percent, in each of 2 years of removal. The study found that home range sizes remained the same in both the experimental and control areas. Litter sizes increased significantly in the removal area 2 years after the beginning of the removal. However, litter sizes were confounded by changes in the prey base. Litter size was significantly related to rabbit abundance, while rodent abundance was less of a factor. Accounting for changes in both prey abundance and coyote density, litter size was significantly related to total prey abundance per coyote.

Given the data above and the study by Gese, it is unlikely that coyote harvest on Malheur Refuge is negatively impacting coyote populations.

Population-specific Impacts: Pronghorn

The Boundary Unit is located at the eastern edge of the State of Oregon Juniper Hunt Unit 71. Population data were not reported for 2009 or 2010, but in 2008, ODFW (2010d) reported that aerial counts averaged 2.1 pronghorn per mile for this unit. This compares with a statewide average of 2.8 pronghorn per mile for 2008.

Hunt data are available for 2009 for both statewide harvest and local unit harvest and are presented in Table B-10.

**Table B-10. Reported 2009 Pronghorn Harvest on the Refuge, State Hunting Unit, and State Scales**

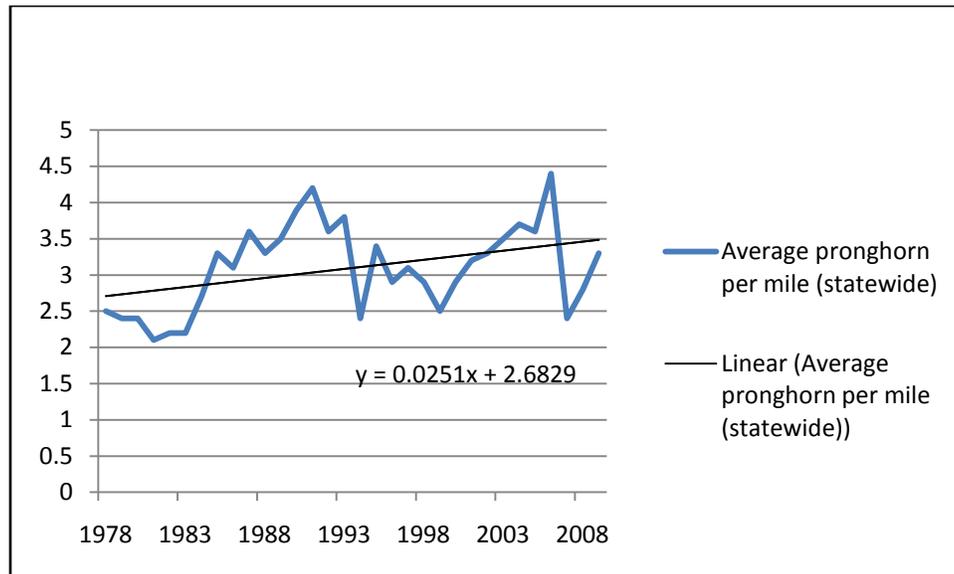
	Number Reported as Taken	Percent of State Reported Harvest
Refuge	Unknown <sup>1</sup>	Unknown
Juniper Unit	70 <sup>2</sup>	5%
State of Oregon	1,424 <sup>3</sup>	100%

<sup>1</sup> Although the Refuge harvest number is unknown, the Refuge law enforcement officer estimates that approximately half of the hunters with tags for the late-season muzzleloader hunt concentrate along the Boundary Unit.

<sup>2</sup> Pronghorn data from 2009 (ODFW 2010d).

<sup>3</sup> Pronghorn data from 2009 (ODFW 2010d). (Also available at: [http://www.dfw.state.or.us/resources/hunting/big\\_game/controlled\\_hunts/docs/hunt\\_statistics/11/PRONGHORN\\_HARV\\_Trend\\_1950-2010.pdf](http://www.dfw.state.or.us/resources/hunting/big_game/controlled_hunts/docs/hunt_statistics/11/PRONGHORN_HARV_Trend_1950-2010.pdf).)

Data are not available at the Refuge or unit level to estimate population impact or trends from hunting. In addition, since population data are gathered and presented as a linear estimate (animals/mile), it is not possible to directly calculate the density of animals per unit area or the total number of animals within a unit. However, linear survey data for pronghorn presented back to 1945 (ODFW 2010d) allow trend analysis (at least at the State level), which permits some conclusion about whether populations may be increasing or decreasing. Since 1978, pronghorn at the State level have increased at an average rate of approximately 2 percent per year, as illustrated in Figure B-1.



Source: ODFW 2010d

**Figure B-1. Pronghorn population trends for the State of Oregon, 1978-2009.**

Given overall population trends as well as the percentage of pronghorn taken in the local State hunting unit, it is unlikely that Refuge harvest, if projected at current levels for the next 15 years, would negatively impact pronghorn populations.

Population-specific Impacts: Deer

The Boundary Unit is located within the State of Oregon Juniper Unit. Although overall harvest of deer within the Boundary Unit area during the several open seasons is unknown, it is estimated that during one of the open hunts (the late-season muzzleloader hunt), approximately half of the 10 tag-holders use the Boundary Hunt Unit (Megan 2011) (Table B-11).

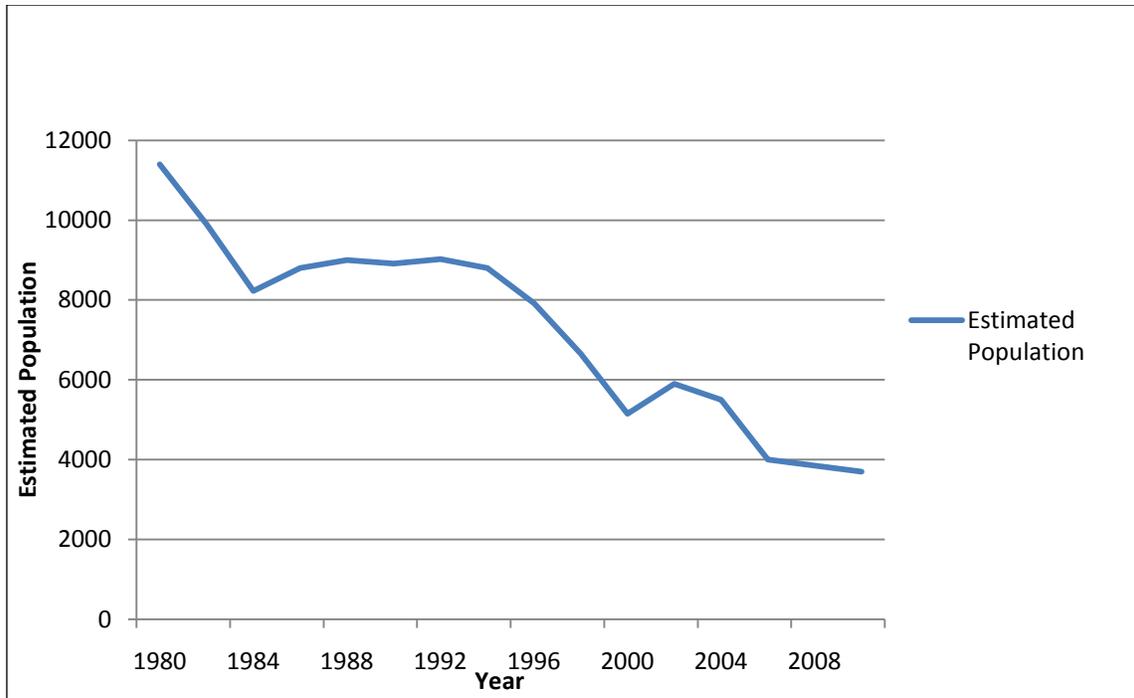
**Table B-11. Reported 2009 Deer Harvest on the Refuge, State Hunting Unit, and State Scales**

	<b>Number Reported as Taken</b>	<b>Percent of State Reported Harvest</b>
Refuge	Unknown <sup>1</sup>	Unknown
Juniper Unit	102 <sup>2</sup>	0.5%
Eastern Oregon total	20,980 <sup>2</sup>	100%

<sup>1</sup> Although the Refuge harvest number is unknown, the Refuge law enforcement officer estimates that approximately half of the hunters with tags for the late-season muzzleloader hunt concentrate along the Boundary Unit.

<sup>2</sup> Pronghorn data from 2009 (ODFW 2010d).

Mule deer across the West and in Oregon are declining in population, and are below current management objectives in Oregon. Populations have dropped by about a third statewide since 1980 (Whittaker 2011) after having reached a peak in the 1950s and 1960s (ODFW 2011b). Deer populations in the State unit encompassing the Refuge (Steens Mountain Unit) have dropped by approximately two-thirds in the last 30 years. Data for populations in the Steens Mountain Unit (which encompasses the Refuge and is just east of the Juniper Unit) are shown in Figure B-2. ODFW (2011b) attributes the primary causes of the observed decline to the combined effects of drought and severe winters, coinciding with an increased number of predators.



Source: ODFW 2011b.

**Figure B-2. Mule deer population trend, Steens Mountain Unit, 1980-2009.**

Continuing to allow mule deer harvest on the Boundary Hunt Unit would continue an incremental level of pressure on a declining population. However, given that the Boundary Unit constitutes a small fraction of the area of the Juniper Unit, and harvest within the Juniper Unit is less than 1 percent of the eastern Oregon harvest, the additional local and regional population pressure stemming from hunting on the Boundary Unit is expected to be negligible to minor. The State of Oregon (ODFW 2011b) has identified a number of strategies to boost mule deer populations, none of which include reduced hunting in the Juniper Hunt Unit.

Population-specific Impacts: Nuttall’s Cottontail and Jack-tailed Jackrabbit

An estimated 10 to 12 hunters use the Boundary Hunt Unit to pursue rabbit and/or coyote each year (Megan 2011). Statewide statistics on rabbits harvested are not available; however, ODFW (date unknown) states that rabbit hunting is the third most popular type of hunting activity in the United States, behind wild turkey and deer hunting.

Population estimates for local rabbit populations are unavailable; however, a study done in Central Oregon in 1972-1973 that used monthly censuses in a shrub-juniper scabland habitat (McKay and Verts 1978) reported that Nuttall’s cottontail population densities ranging from 6.6 to 254.4 animals per 100 ha (2.6 to 103 animals/100 acres), with marked seasonal fluctuations.

Lagomorphs are capable of extremely high productivity; a doe jackrabbit produces 2 to 6 young every 6 weeks during the breeding season, from February to June. The young born in February become sexually mature by early summer. As a result, lagomorphs are very important prey for a number of predators. Black-tailed jackrabbits naturally undergo 10- to 11-year population cycles.

Without better local data on harvest and population, only general conclusions are possible, based on reasonable assumptions and life history information. Currently, a small number of hunters is thought to hunt rabbits within the Boundary Hunt Unit, and hunting levels in the unit are expected to change little over the next 15 years. If habitat conditions remain stable (jackrabbits are sensitive to reduction in population with wildfire [Kochert et al. 1999]), hunting of jackrabbits and rabbits is likely to have a negligible effect on local or regional rabbit populations.

#### Other Refuge-specific Impacts

**Impacts to Non-Target Wildlife:** Non-hunted wildlife would include any non-target birds; small- and medium-sized mammals; reptiles; amphibians; and invertebrates. Occasionally, non-target species are illegally killed by hunters by accident or intentionally, or are disturbed by hunter presence or noise.

The cumulative effects of disturbance to non-hunted birds under the proposed action are expected to be minor for the following reasons: hunter education courses are required for youths; hunting seasons do not coincide with the nesting season, so reproduction would not be reduced by hunting; and disturbance to the foraging or resting activities of migrating or resident birds might occur, but hunting is still expected to involve a small numbers of participants. The North Malheur Lake Unit and Buena Vista Unit would have walk-in access.

Disturbance to other taxa would be unlikely or negligible for the following reasons: encounters with reptiles and amphibians, invertebrates, and small mammals in the early fall would be few and should not have cumulative negative effects on Refuge populations; Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife; and vehicles would be restricted to public roads and the harassment or taking of any wildlife other than the game species legal for the season would not be permitted.

Sandhill cranes stage on the southern portion of Malheur Lake and in the Buena Vista wetlands until mid-October. Under Preferred Alternative 2, a late season opening for the Buena Vista Unit would allow sufficient protection of the sandhill cranes until they migrate farther south, and thus mitigate any hunting-related impacts to sandhill cranes. Other birds using the area may be disturbed by noise and human presence; however, since most birds have already migrated during the fall, disturbance levels would be minor overall. Outreach with hunting brochures and timely information on the website would help educate hunters on hunting opportunities, regulations, and ethical hunter behavior.

Waterfowl can die from toxic lead shot if they eat even very small amounts of spent lead shots; shot pellets deposited during fall hunting seasons can later be ingested by waterfowl and other wildlife feeding in wetland areas where hunting occurs. On Malheur Refuge, only federally approved nontoxic shot is allowed for upland game hunting to eliminate this hazard for waterfowl. Nontoxic shot is defined by USFWS as any shot type that does not cause sickness and death when ingested by migratory birds, and includes shots made of steel, bismuth, tungsten-iron, or tungsten-polymer.

Dogs would increase the level of disturbance to target and non-target species, but this impact is expected to be minor, especially to migratory wildlife, and necessary to support the use and ensure successful harvests. Dogs would be required to be under the close control of their owners while on Refuge.

**Loss of Habitat from Facility Construction:** No additional new facilities would be added to support this use in addition to the general visitor use facilities described in the CD for wildlife observation, photography, and interpretation.

**Vegetation, Soil, and Water Impacts:** Foot travel associated with accessing the hunt units could potentially result in temporary and minor vegetation trampling. Based on past Refuge history and trends, hunting usually involves very small numbers of hunters; thus, the effect to vegetation would likely be negligible. No impact is expected to soil or water resources as a result of this use.

**Impacts to Listed Species:** There are no listed or endangered species on the Refuge. Greater sage-grouse (*Centrocercus urophasianus*) and the Great Basin Columbia spotted frog (*Rana luteiventris*) are designated as Federal candidate species for listing under the Endangered Species Act. Incidental post-breeding observations of sage-grouse have been made in recent years in the southeast portion of the Blitzen Valley. Spotted frogs have been documented in limited areas on the Refuge (Engle 2001; Pearl et al. 2010; Rombough and Engler 2010; ODFW 2011). However, it is unclear at this time if the Refuge population is part of the Great Basin distinct population, which is the Federal candidate species, or if they belong to the Oregon population.

Although the Refuge has occurrences of these candidate species, it is anticipated that impacts from upland game hunting uses and facilities would be minor to negligible. The greater sage-grouse is not a hunted species on the Refuge, although disturbance may result from noise related to hunting activities during the hunting season, which overlaps with the most recent seasonal observations of sage-grouse on the Refuge. Hunting is not allowed south of the Buena Vista Unit, and there have been no occurrences of spotted frogs in the Blitzen River Valley north of Knox Ponds. Additionally, frogs would most likely be hibernating during the winter, and hunting season ends prior to breeding season. Public education would assist in raising awareness and preventing undue impacts to these species. If uses result in unacceptable adverse effects to candidate species or habitats, the Refuge would impose restrictions to mitigate disturbance.

**Impacts to Other Priority Public Uses:** The phased opening weekends between the north Malheur Lake Hunt Unit and the Buena Vista Hunt Unit would help reduce hunter competition and conflicts. Additionally, hunting numbers generally decrease over the hunting season after opening weekends, further reducing impacts of the hunting season.

Hunting has the potential to disturb Refuge visitors engaged in other priority public uses; however, given the season during which hunting occurs, the likelihood of conflicts is low. Although Center Patrol Road is the area most used by other visitors during the migration seasons, use is very light during hunting season. State regulations also prohibit shooting from on and across roads. This is expected to mitigate any overlap conflicts between hunting and other uses in the Buena Vista Unit.

**Infrastructure:** No significant effects to roads, trails, or other infrastructure from the hunting program are foreseen. Normal road, trail, and facility maintenance would continue to be necessary. Additional facility construction or upgrade, if needed, is addressed in the Availability of Resources section.

**Other Effects:** There could be some indirect beneficial impacts of Refuge hunting. Refuge hunting can contribute to wildlife and habitat conservation and provide educational and sociological benefits. The hunting community in general remains the largest support base for funding land acquisitions in the Refuge System through purchase of Duck Stamps. Upland game hunting at the Refuge provides a

priority public use and helps meet the Refuge’s goals of wildlife-dependent recreation for all visitors. Additionally, providing youth hunting opportunities is an important initiative in the USFWS, and enhancing this opportunity on the Refuge helps address a public desire to see more hunting opportunities for youth.

### **Public Review and Comment**

Various opportunities were provided for the public to engage in the CCP planning process. Appendix J details public involvement undertaken during the development of the CCP/EIS. Written comments on this draft CD are welcome.

### **Determination:**

<u>          </u>	Use is Not Compatible
<u>  X  </u>	Use is Compatible with the Following Stipulations

### **Stipulations Necessary to Ensure Compatibility**

- Only federally approved nontoxic shot may be used or be in possession while hunting on the Refuge.
- Vehicles would be allowed only on maintained public roadways. Parking is allowed only within one vehicle length of the roadway. Hunters would be instructed to not block dike and field accesses.
- Overnight parking, camping, and campfires would not be permitted on the Refuge.
- Hunting dogs are strongly encouraged to increase hunter success and retrieval rate. Dogs must be kept under close control.
- Hunting closures would be in effect near Refuge Headquarters, Buena Vista Station, and the Malheur Field Station. Shooting from or across public roads or road right-of-ways would be prohibited.
- Law enforcement patrols would ensure safety and minimize conflicts with other priority public uses by providing information about hunting boundaries and seasons to the general public and those using other Refuge programs. Information would be provided at interpretive kiosks, on the Refuge website, and in Refuge offices.

### **Justification**

Under the National Wildlife Refuge System Administration Act, as amended, upland game hunting is a wildlife-dependent recreational activity that receives enhanced consideration in the CCP planning process and is to be encouraged on National Wildlife Refuges if compatible with refuge purposes. Despite the direct and indirect impacts associated with sport upland game hunting, upland game populations are unlikely to be affected significantly by the hunting program on the Refuge. Upland game population objectives and allowable harvests are determined by the State of Oregon. Limited hunt seasons, two weekend openings, and no-hunt zones ensure that upland game, as well as non-target species, will find adequate food and rest areas on the Refuge even in the midst of the hunting season. Thus, allowing upland game hunting to occur under the stipulations described above will not materially detract or interfere with the purposes for which the Refuge was established or the Refuge’s mission.

### **Mandatory Reevaluation Date**

09/2027 Mandatory 15-year Reevaluation Date (for priority public uses)

### **NEPA Compliance for Refuge Use Decision**

X Environmental Impact Statement and Record of Decision

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**Signatures:**

Prepared by: \_\_\_\_\_  
(Signature) (Date)

Refuge Manager/  
Project Leader  
Approval: \_\_\_\_\_  
(Signature) (Date)

**Concurrence:**

Refuge Supervisor: \_\_\_\_\_  
(Signature) (Date)

Regional Chief,  
National Wildlife  
Refuge System: \_\_\_\_\_  
(Signature) (Date)

## **B.5 Fishing Compatibility Determination**

**RMIS Database Use:** Fishing (general)

**Refuge Name:** Malheur National Wildlife Refuge

### **Establishing and Acquisition Authorities and Refuge Purposes**

- “ ... a Refuge and breeding ground for migratory birds and other wild life ... ” Executive Order 7106, dated July 19, 1935, as modified by Public Land Order 1511, dated September 24, 1957
- “ ... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act)
- “ ... for the development, advancement, management, conservation, and protection of fish and wildlife resources ... ” 16 U.S.C. 742f(a)(4)
- “ ... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ... ” 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)
- “ ... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans ... ” 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

### **National Wildlife Refuge System Mission**

The mission of 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” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd et seq.]).

### **Description of Use**

This CD examines recreational fishing in designated areas of the Refuge as proposed under Preferred Alternative 2 of the draft CCP/EIS. A commercial carp fishery was found compatible on the Refuge in 2009 and is not examined in this CD (USFWS 2009).

**Program Offerings:** Fishing currently occurs at Krumbo Reservoir and the South Loop along the Blitzen River and its tributaries. Species allowable for take are redband trout, rainbow trout, largemouth bass, and carp. Rainbow trout and largemouth bass occur in Krumbo Reservoir, and redband trout, other native fish, and carp occur in the Blitzen River. All fishing is permitted by angling only. Table B-12 shows the following regulations for sport fishing as related to the Refuge under the 2011 ODFW Sport Fishing Regulations.

**Table B-12. ODFW Regulations for Sport Fishing for 2011<sup>1</sup>**

Species	Regulations
<b>Krumbo Reservoir<sup>2</sup></b>	
Trout (rainbow)	<ul style="list-style-type: none"> <li>• Open fourth Saturday of April to October 31</li> <li>• Catch: 5 per day, 2 daily limits in possession</li> <li>• Length: 8-inch minimum length</li> <li>• Bait: Artificial only</li> </ul>
Largemouth bass	<ul style="list-style-type: none"> <li>• Open fourth Saturday of April to October 31</li> <li>• Catch: 5 per day, 2 daily limits in possession</li> <li>• Length: No more than 3 over 15 inches in length</li> <li>• Bait: Artificial only</li> </ul>
<b>Blitzen River Mainstem, East Canal, and Tributaries Upstream and Including Bridge Creek (South Fishing Loop)</b>	
Trout (redband)	<ul style="list-style-type: none"> <li>• Open May 28-Oct. 31, 2 per day</li> <li>• Open Jan. 1-May 27 and Nov. 1-Dec. 31, catch and release for trout</li> </ul>

<sup>1</sup> Source: ODFW 2010.

<sup>2</sup> Krumbo Reservoir falls under the same ODFW regulations as lakes, except for its special fishing dates.

Location of Use, Associated Facilities, and Access

**Krumbo Reservoir:** Krumbo Reservoir is 184 acres in size. It is not a natural water body and has historically been managed for irrigation and fishing activities. ODFW annually stocks Krumbo Reservoir with sterilized rainbow trout; in 2010, ODFW stocked 13,100 rainbow trout in Krumbo Reservoir. The area is equipped with a number of public use facilities, including picnic tables for lunch-time activities, parking, and restrooms, making the Reservoir a big attraction for families with children. Access to the site is via vehicle by Krumbo Lane. Once at the Reservoir, anglers may fish from any shoreline area and an informal trail circles the reservoir for this purpose. In addition, a boat launch permits boating access on the Reservoir itself. Boats with electric motors and non-motorized boats would continue to be authorized for use on Krumbo Reservoir, except when the water begins to ice over.

**South Fishing Loop:** The South Fishing Loop near P Ranch includes the Blitzen River mainstem, East Canal, and tributaries upstream, including Bridge Creek. This unit is open year-round, although different regulations apply in different seasons, as indicated in Table B-12. This is a popular fly fishing area for locals and out-of-area users. Under Preferred Alternative 2, drive-in access along the East Canal Road to the confluence of the East Canal with Bridge Creek would be opened in order to improve fishing opportunities and to accommodate vehicle access to Granddad Reservoir on Bureau of Land Management lands. People may continue to use this road as a hiking trail if they wish. In addition, the River Trail, a pedestrian trail, is available to access this area. A new pedestrian crossing at Bridge Creek would be constructed to improve fishing access west of East Canal.

**Headquarters Fishing Unit:** Additionally, under Preferred Alternative 2, the Refuge would provide a new seasonal stream fishing opportunity at the Headquarters Fishing Unit along the Blitzen River from Sodhouse Lane north to the Boat Landing Road bridge near Refuge Headquarters, accessible by

a fishing trail along the dike. At the new Headquarters Fishing Unit, use of bait would be allowed and regulations for catch limits would be defined by ODFW based on state regulations. At the Headquarters Unit, fishing would only be available August 1 to September 15 to mitigate conflicts with migrating birds.

**Other Facilities:** The Refuge would also provide informational kiosks at strategic entrance points and additional signage to enhance visitors’ knowledge of fishing regulations and provide directional and program information.

**Number of Visitors and Seasonal Patterns:** At Malheur National Wildlife Refuge, an estimated 1,300 visits in 2011 were for fishing activities. With increased fishing access and additional fishing opportunities, the number of fishing visits is expected to grow over 15 years to 1,750 visits per year.

Under Preferred Alternative 2, the Reservoir and Krumbo Lane would be opened year-round to access for fishing, wildlife observation, boating, and hiking, which represents a big increase from the current open season of April to October. However, the majority of the use would likely continue to occur during spring and fall when the weather and water are cool, and year-round fishing would eliminate any pressures and crowding associated with fishing season opening day. Fishing use on the South Loop of the Blitzen River typically peaks in late spring when the water runoff from Steens Mountain settles and the water clears. The South Loop Fishing Unit and the new Headquarters Fishing Unit would be seasonal fishing opportunities as outlined above.

**Availability of Resources**

Availability of resources for administering and managing the fishing program under Preferred Alternative 2 are detailed in Table B-13.

**Table B-13. Costs to Implement the Use**

Category	One-time Expense (\$)	Annual Expense (\$/year)
Develop fishing brochure	\$1,500	\$2,000
Develop outdoor fishing information kiosks	\$60,000	
Build 2-3 new pedestrian crossings and complete development of loop trail at South Fishing Loop	\$275,000	
Open new seasonal bank fishing opportunity along the Lower Blitzen River with fishing trail, two bridges, parking, and portions that meet ADA standards	\$275,000	
Replace Krumbo Reservoir floating platform and maintain facilities	\$35,000	\$2,000
Fishing program administration and management (programmatic, law enforcement, information)		\$6,000
<b>Total</b>	<b>\$646,500</b>	<b>\$10,000</b>

Administering the fishing program does not require significant staff time, equipment, or funding. The Refuge has one FTE Visitor Services Manager, and one FTE position for law enforcement that

patrols the Refuge during fishing season to ensure compliance with state and Federal regulations and Refuge conditions. The majority of the staff time spent administering this program would fall mostly on the law enforcement position. Other Refuge staff assists in maintenance of fishing facilities like access roads, trails, kiosks, and platforms; in general, the fishing program uses many of the same facilities and resources as the wildlife observation, photography, and interpretation program, including trail and parking area maintenance, facility and road maintenance, sign posting, and construction projects (USFWS 2011b). Additional costs and staff time would include developing and printing fishing brochures and constructing new kiosks for the fishing program.

Some fishing program enhancements may currently lack funding, but the Refuge would develop partnerships and seek additional funding resources over the next 15 years as necessary to complete projects. Based on the availability of resources, the Refuge would have sufficient funds for managing current and expected levels for fishing. Exact costs will be developed during design and implementation.

### **Anticipated Impacts of the Use**

#### General Impacts Expected from the Scientific Literature

A general assessment of impacts resulting from fishing uses has been compiled from the literature and is briefly summarized below.

***Disturbance to Wildlife:*** Fishing as a solitary and stationary activity tends to be less disturbing to wildlife than hunting or motorized boating (Tuite et al. 1983). Fishing has the potential to cause disturbance to birds and other wildlife using open waters and tributaries where fishing occurs. Fishing activities may influence the composition of bird communities, as well as the distribution, abundance, and productivity of waterbirds (Tydeman 1977; Bouffard 1982; Bell and Austin 1985; Bordignon 1985; Edwards and Bell 1985; Cooke 1987; Bouffard and Hanson 1997). Anglers often fish in shallow, sheltered bays and creeks that birds prefer, which can negatively impact distribution and abundance of waterfowl, grebes, and coots (Cooke 1987). Increases in anglers and associated shoreline activity have been found to discourage waterfowl from using otherwise suitable habitat (Jahn and Hunt 1964). When compared to non-fishing days and/or non-fishing rivers, anglers influenced the numbers, behavior, and diurnal distribution of avian scavengers present at sites along the Skagit and Toutle rivers in Washington, disrupted feeding, and increased energy expenditure through avoidance flights (Knight and Knight 1984; Knight et al. 1991).

***Stream Fishing Impacts:*** Shoreline activities related to stream fishing, such as human noise, would cause some birds to flush and go elsewhere. Waterbirds and waterfowl in particular use shorelines seasonally for resting, feeding, and nesting. Anglers often use vehicles to gain access to angling sites and remain there for long periods of time. Furthermore, anglers frequently show long periods of inactivity interspersed with short periods of rapid movements, which has the potential to disturb nearby wildlife (Bell and Austin 1985).

***Boating Impacts:*** Boating associated with fishing can alter bird distribution, reduce the use of particular habitats or entire areas by waterfowl and other waterbirds, alter feeding behavior and nutritional status, and cause premature departure from areas due to the noise and speed of boats (Bouffard 1982; Kaiser and Fritzell 1984; Korschgen et al. 1985; Havera et al. 1992; Ward and Andrews 1993; Knight and Cole 1995; Knapton et al. 2000). On the Missouri's Ozark Scenic Riverways, herons often left the river for areas of dense habitat or less productive tributaries when

the number of recreationists increased (Kaiser and Fritzell 1984). The level of disturbance to waterfowl has been found to vary considerably based on watercraft type. A study by Havera et al. (1992) showed waterfowl took flight and flushed farther in response to hunting and fishing craft, while few flushed because of barges. On the Upper Mississippi River, which includes the Upper Mississippi River National Wildlife and Fish Refuge, birds were found to be more sensitive to boats with outboard motors (Korschgen et al. 1985). In addition, trampling of vegetation and deposition of sewage or other chemicals from recreation has been found to impact freshwater plants and wildlife (Liddle and Scorgie 1980).

***Off-Road Vehicle Impacts:*** Wildlife can be impacted when they are disturbed and flushed from feeding, resting, or nesting areas vulnerable to loud noise and activity from off-road vehicles. In addition, temporary disturbance to habitat could impact nesting and foraging resources available for wildlife. In general, disturbance impacts of off-road vehicles are related to the intensity of use or use characteristics, in combination with the level of fragility of the affected environment. A majority of the off-road vehicle uses are in coordination with the grazing and haying program, and use for fishing is only a minor subset (USFWS 2011a).

### Refuge-specific Impacts

This section evaluates the likely impact at the Refuge itself, considering the scientific studies discussed above and considering the uses within the context of Malheur Refuge.

***Disturbance-related Impacts from Reservoir Fishing:*** Krumbo Reservoir is one of the most heavily used areas on the Refuge. During the spring and fall, disturbance, especially near the parking lot and boat launch, undoubtedly prevents use by a variety of waterfowl and waterbirds. However, the Refuge maintains numerous other ponds and flooded areas in the spring and into summer and therefore spring/summer disturbance is of negligible concern, given the Refuge context.

Previous research has shown that the level of disturbance to waterfowl varies considerably based on watercraft type. To limit disturbance impacts to wildlife, only non-motorized boating and electric motorized boating would be allowed on Krumbo Reservoir. The use of non-motorized and electric motorized boating minimizes noise associated with boating and prevents the spread of oil and gas residue associated with diesel- and gas-powered motorized boats. It also reduces the speed with which anglers can travel on the Reservoir.

Under Preferred Alternative 2, Krumbo Reservoir and Krumbo Lane would be opened year-round to access, except when the water ices over. A concern raised by some is that increasing wintertime access to the Reservoir could have potential impacts to wintering waterfowl that use Krumbo Reservoir and Krumbo Swamp and Otter Reservoir along Krumbo Lane. There are limited open-water resources available on the Refuge during winter as most areas are dry or have frozen. The number of birds using the Reservoir during the winter is typically less than 400 birds on any given day, and there are less than 100 birds during the coldest part of the season (J. Dastyck, personal communication); most birds have migrated farther south during the winter. The Reservoir comprises around 20 percent of the total 1,004 acres of available open water wintering habitat on the Refuge, leaving 820 acres (more than 80 percent) of open water wintering habitat including Boca Lake, Benson Reservoir, and East Knox Reservoir. Given this and the likelihood that the number of visitors to the Reservoir during the winter months would be significantly less than in the spring, summer, or fall months, the disturbance impact to wintering birds is expected to be minor.

ODFW annually stocks Krumbo Reservoir with triploid rainbow trout, meaning they are sterilized and never develop normal eggs or sperm and are unable to reproduce. This would continue under Preferred Alternative 2. Sterilization negates the risk of any genetic reproduction and modification with native redband trout, thus creating a negligible impact on the native fishery. Additionally, Krumbo Reservoir is dammed, which prevents rainbow trout from migrating into the Blitzen River. Largemouth bass are also present in Krumbo Reservoir from historical stocking, but are not currently stocked and are a self-sustaining population; native redband trout are not found in the Reservoir, as Krumbo Creek water levels are not high enough to maintain a sustainable native population for spawning. Genetic studies have occurred in the Blitzen River for any evidence of introgression of redband trout with hatchery rainbow trout and there has been no strong evidence indicating this in the Blitzen population of redband, specifically in Bridge and Mud creeks (ODFW 2005).

With the low number of birds present, low visitor use levels, and availability of additional wintering habitat and sanctuary, it is expected that year-round access at Krumbo Reservoir would have negligible impacts. Wildlife surveys and monitoring would be conducted to ensure disturbance stays at a minimum.

***Disturbance-related Impacts from Stream Fishing:*** Stream fishing allows anglers direct access to a portion of the Blitzen River, East Canal, and Mud and Bridge Creeks. Under Preferred Alternative 2, the South Loop along the East Canal would change from walk-in only access to include drive-in access up to the confluence of the East Canal with Bridge Creek. This has the potential to increase disturbance to wildlife to moderate levels, as it is expected this change would attract more anglers to the fishing area and disperse users across a wider stretch of the river (compared to present). The River Trail on the west bank of the Blitzen River would remain walk-in access.

Under Preferred Alternative 2, a new seasonal stream fishing opportunity at the Headquarters Fishing Unit from Sodhouse Lane to the Boat Landing Road bridge near Headquarters would be opened. This would increase the amount of stream fishing along the Blitzen River by nearly 1 mile for a total of 14 miles on the Refuge. This could increase the potential for disturbance to resting and feeding waterbirds and waterfowl, as well as impacts to shoreline habitat and vegetation. However, the new fishing area would only be open seasonally from August 1 to September 15 after birds have fledged and moved on. Given this, and because generally, the fishing pressure along the Blitzen River is low, it is anticipated that with the limitations included under Preferred Alternative 2, disturbance to wildlife would be minor.

A new pedestrian crossing at Bridge Creek would be constructed under Preferred Alternative 2 to enhance access to fishing west of East Canal along Bridge Creek. The bridge would increase the number of anglers in an area that was previously hard to access. Construction of the trail enhancements would be done in a way to reduce impacts to wildlife and resources.

***Direct Mortality to Target Species (Take):*** Fishing would result in direct take of target fish. Harvest is coordinated with ODFW to avoid excess pressure on populations. Fishing would be permitted by angling only and would be restricted to artificial flies and lures in streams, except in the Headquarters Fishing Unit where use of bait would be allowed.

Barbed hooks would be permitted to increase the success of take. Some impacts may come from barbed hooks to native redband trout populations, but this is expected to be minor as redband trout do not occur in Krumbo Reservoir and fishing pressure on the Blitzen River is generally low. Outreach

with fishing brochures, informational panels, and public education on best fishing practices would help educate anglers on fishing regulations and ethical behavior.

***Loss of Habitat from Facility Construction:*** Under Preferred Alternative 2, new panels constructed for fishing would result in 0.5 acre of habitat loss, which is a fraction of a percentage of the Refuge; thus, habitat loss from new facilities is considered negligible. No additional new facilities would be added to support this use separate from general visitor use facilities (USFWS 2011b).

***Vegetation, Soil, and Water Impacts:*** Some vegetation, soil, and water impacts would be anticipated from bank fishing and access to water along the Krumbo Reservoir and Blitzen River shorelines where anglers access the areas by foot. Impacts would also be anticipated as a result of allowing vehicle access on East Canal. However, trail enhancements along the South Loop may also benefit the surrounding habitat by concentrating users on a formal trail instead of social trails that are not regulated.

The developed parking and concrete boat ramp at Krumbo Reservoir potentially carries stormwater runoff and toxins from vehicles into the Reservoir, although these facilities also contribute positively to habitat conservation by concentrating visitors on hardened surfaces and decreasing impacts to vegetation and soil adjacent to the fishing area. An undeveloped pedestrian fishing trail circles the perimeter of the Reservoir, potentially causing impact to shoreline habitat (USFWS 2011b). Additional impacts related to public use at the Reservoir include a certain amount of litter and general garbage left at shoreline fishing sites.

***Impacts to Listed Species:*** There are no listed or endangered species on the Refuge. Greater sage-grouse (*Centrocercus urophasianus*) and the Great Basin Columbia spotted frog (*Rana luteiventris*) are designated as Federal candidate species for listing under the Endangered Species Act. Incidental post-breeding observations of sage-grouse have been made in recent years in the southeast portion of the Blitzen Valley. Spotted frogs have been documented in limited areas on the Refuge (Engle 2001; Pearl et al. 2010; Rombough and Engler 2010; ODFW 2011). It is unclear at this time if the Refuge population is part of the Great Basin distinct population, which is the Federal candidate species, or if they belong to the Oregon population.

Impacts to Columbia spotted frogs would be expected to increase under Preferred Alternative 2 with expanded stream fishing access for anglers along the South Fishing Loop of the Blitzen River and its tributaries, and the construction of a new pedestrian crossing at Bridge Creek to access a portion of fishable area west of East Canal. Public tramping along the shoreline during the April to May frog breeding season has the potential to disturb/dislodge egg masses. It is anticipated that disturbance from anglers accessing the shoreline would be sporadic, and impacts would be minor due to generally low levels of fishing activity and the patchy occurrences of Columbia spotted frogs on the Refuge. Public education or use of interpretation would assist in raising awareness and preventing undue impacts to this species. Informational panels and additional signage would also be posted at the South Fishing Loop to inform anglers of proper fishing practices. If stream fishing results in unacceptable adverse effects to candidate species or habitats, the Refuge would impose restrictions on stream fishing to mitigate disturbance.

***Impacts to Other Priority Public Uses:*** Fishing generally results in little disturbance to other visitors. Both fishing and hunting would use Boat Landing Road to access the Blitzen River; however, the uses occur at different seasons, with fishing from August 1 to September 15 and hunting opening on the fourth Saturday of October.

**Infrastructure:** No significant effects to roads, trails, or other infrastructure from fishing are foreseen. Normal road, trail, and facility maintenance would continue to be necessary. Additional facility construction or upgrade, if needed, is addressed in the Availability of Resources section.

### Public Review and Comment

Various opportunities were provided for the public to engage with the CCP planning process. Appendix J details public involvement undertaken during the development of the CCP/EIS. Written comments on this draft CD are welcome.

### Determination:

<u>          </u>	Use is Not Compatible
<u>  X  </u>	Use is Compatible with the Following Stipulations

### Stipulations Necessary to Ensure Compatibility

#### General Stipulations

- Use is open daily from dawn to dusk. Camping, overnight use, swimming, and fires are prohibited.
- All fishing on the Refuge would require an appropriate state license and tag, and all fishing would be consistent with applicable state and Refuge regulations.
- Fishing on the Refuge would be permitted by angling only and would be restricted to artificial flies and lures in streams, except in the Headquarters Fishing Unit where use of bait would be allowed. Only catch-and-release fishing is allowed in the South Fishing Loop from January 1 to May 27 and November 1 to December 31. No discharge of weapons would be allowed on the Refuge, and the use of bows and arrows, crossbows, and spear guns would be prohibited.
- The Refuge would provide information on fishing and access at appropriate sites and through printed brochures. Information would also include current migratory bird and Refuge regulations, as well as maps of closed areas.
- The Service shall maintain public use facilities to minimize waste problems on shorelines.
- ODFW would continue to monitor harvest by anglers and routinely adjust regulations to ensure that overall populations of game species remain healthy into the future.
- Law enforcement patrols would be conducted to ensure compliance with fishing regulations.

### Justification

Fishing receives enhanced consideration in the CCP planning process and is considered a priority public use when determined compatible. Providing a quality fishing program contributes to achieving the Refuge's goals. The fishing opportunities and anticipated level of use, as described, were determined to not materially detract from the ability of the Refuge to meet its purposes, despite the potential impacts that fishing and supporting activities (boating) can have on wildlife and habitats. Only electric boating or non-motorized boating will be allowed for Reservoir fishing, thus lessening the disturbances to waterfowl and other wildlife. The combination of closed areas, seasonal use areas, minimally used areas, and seasonal high-use areas allows sport fishing and high-quality fish and wildlife habitat to co-exist on the Refuge by dispersing uses throughout different areas and different seasons.

It is anticipated that wildlife, primarily waterbirds, will find sufficient food resources and resting places such that their abundance and use of the Refuge will not be measurably lessened; fishing pressure will not cause fish stocks to decline; fish stocking with sterilized triploid rainbow trout will not cause genetic modification to the native redband trout fishery; the physiological condition and production of waterfowl and other waterbirds will not be impaired; behavior and normal activity patterns will not be altered dramatically; and overall wildlife welfare will not be negatively impacted.

### **Mandatory Reevaluation Date**

09/2027 Mandatory 15-year Reevaluation Date (for priority public uses)

### **NEPA Compliance for Refuge Use Decision:**

X Environmental Impact Statement and Record of Decision

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## **B.6 Commercial Tours and Photography Compatibility Determination**

**RMIS Database Uses:** Photo/Video/Film or Audio Recording (commercial); Wildlife Observation Guiding/Outfitting

**Refuge Name:** Malheur National Wildlife Refuge

### **Establishing and Acquisition Authorities and Refuge Purposes**

- “ ... a Refuge and breeding ground for migratory birds and other wild life ... ” Executive Order 7106, dated July 19, 1935, as modified by Public Land Order 1511, dated September 24, 1957
- “ ... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act)
- “ ... for the development, advancement, management, conservation, and protection of fish and wildlife resources ... ” 16 U.S.C. 742f(a)(4)
- “ ... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ... ” 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)
- “ ... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans ... ” 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

### **National Wildlife Refuge System Mission**

The mission of 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” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd et seq.]).

### **Description of Use**

This CD addresses non-consumptive commercial uses related to photography and wildlife/nature observation. This determination does not address consumptive uses such as commercial guiding for hunting and fishing, nor activities *not* related to natural, historical, or cultural subjects. Additionally, a variety of non-profits and educational institutions engage in natural resource– and EE-based activities on the Refuge. Although this use is similar in nature to the commercial recreational use, non-profit and EE-based activities are covered under the CD for EE (USFWS 2011a).

By regulation, the Service may only authorize public or private economic use of the natural resources of any National Wildlife Refuge where it is determined that the use contributes to the achievement of the National Wildlife Refuge’s purposes or the National Wildlife Refuge System’s mission (50 CFR 29.1). Refuge System policy on management of specialized uses (5 RM 17) states that when monetary gain (profit) is the objective of a refuge recreational use, the use is to be managed as an economic use.

Commercial photography is a visual recording (motion or still) by firms or individuals (other than news media representatives) who intend to distribute their photographic content for money or other consideration, including the creation of educational, entertainment, or commercial enterprises as well as advertising audio-visuals for the purpose of paid product or services, publicity, and commercially oriented photo contests (Service Manual [605 FW 5](#)). This typically involves taking still photographs or recording wildlife sounds and images related to a Refuge's wildlife and resources. Commercial tours and guiding are activities conducted by private organizations or businesses using National Wildlife Refuges. These uses are considered beneficial when they support and extend public appreciation and understanding of wildlife, natural habitats, and the mission of a Refuge and the National Wildlife Refuge System.

Commercial photography and observation uses on Malheur National Wildlife Refuge cover a broad range of resource-based activities and tours, including birding, geology, plant identification, art and visual interpretation, music, sound recording, and other similar non-consumptive activities. These uses would usually occur in areas open to the public, using the same facilities associated with non-commercial recreational uses (USFWS 2011b). Users typically engage in guiding and commercial photography at Refuge Headquarters, along Center Patrol Road and at a number of historical and interpretive sites, including Benson Pond, the historic Sodhouse Ranch (when opened), Buena Vista Overlook, Krumbo Reservoir, and the historic P Ranch.

Commercial photography on the Refuge is most often conducted by individuals, while commercial tours are generally conducted in groups; both uses would be expected to occur at smaller levels than non-commercial photography and wildlife observation. These uses may occur year-round on the Refuge, although the best time of year for wildlife photography and observation is during the spring and fall migrations (March to May and September). Activities related to other natural resources (e.g., geology) may occur at other times of the year depending on the program. These uses may be conducted in vehicles on public roads and on foot on designated hiking trails and roads. Due to the large size of the Refuge, uses are mainly conducted in vehicles with occasional stops at public sites to allow users to photograph or view outside the vehicle.

Under Preferred Alternative 2, an SUP would be required for all commercial uses on the Refuge as described under the Stipulations Necessary to Ensure Compatibility section in this document.

### **Availability of Resources**

Under Preferred Alternative 2, user fees would be collected for issuing SUPs to commercial photographers and commercial tours requesting permission to go into a closed habitat/wildlife sanctuary. If any special resources (such as transportation, access to restricted areas, or guide service) are provided by the Refuge staff, these costs will be added to the standard fee for issuing an SUP. Availability of resources for administering and managing commercial recreational uses under Preferred Alternative 2 are detailed in Table B-14.

**Table B-14. Costs to Implement the Use**

<b>Category</b>	<b>One-time Expense (\$)</b>	<b>Annual Expense (\$/year)</b>
Administration and management of SUPs		\$5,000
Offsetting revenues (\$100 for SUP into closed areas)		(\$2,400)
<b>Total</b>		<b>\$2,600</b>

Commercial photography and wildlife guiding use the same facilities and resources as the non-commercial wildlife observation, photography, and interpretation program, including trail and parking area maintenance, facility and road maintenance, sign posting, and construction projects (USFWS 2011b). The Refuge has one FTE position dedicated to administering the commercial recreational uses program as a Visitor Services Manager, in addition to the Refuge Manager who has to approve the SUPs. There is an additional FTE position for any law enforcement needs. Other Refuge staff assists maintenance and construction. The majority of the costs associated with the commercial recreational uses program would be administrative time and costs for SUPs; SUPs are also included under EE but total cost for permits is reflected here. Based on the availability of resources, the Refuge would have sufficient funds for managing current and expected levels of these uses associated with wildlife observation, photography, and interpretation. Exact costs will be developed during design and implementation.

**Anticipated Impacts of the Use**

General Impacts

In general, impacts that would occur from commercial recreational uses would be similar to those expected from non-commercial uses; however, commercial recreational uses could be more disturbing than non-commercial uses because commercial uses tend to occur in groups of people. This effect is explored in this CD.

Impacts that could occur from commercial recreational uses would be similar to those expected from non-commercial wildlife observation and photography activities, especially those expected from larger groups (USFWS 2011b). Such impacts would be expected to include temporary damage to vegetation resulting from trampling, disturbance to nesting birds, and disturbance to feeding or resting birds or other wildlife in the proximity. Commercial recreational uses generally accommodate groups of participants, and studies have shown that increasing group size has an impact on wildlife (Beale and Monaghan 2004; Remacha et al. 2011). In addition to group size, loudness has also been found as an important variable to disturbance of wildlife, and the loudness of people present can be more important than the number of people present (Burger and Gochfeld 1991). Studies showed that reducing group size, allowing safe distances, and reducing noise levels helps minimize negative impacts on wildlife (Burger and Gochfeld 1991; Beale and Monaghan 2004; Remacha et al. 2011).

Refuge-specific Impacts

Commercial recreational uses at the Refuge occur in areas open to the public and, for the most part, are expected to use the same facilities and resources as non-commercial uses (USFWS 2011b). The administration of this use would allow occasional access into closed areas, subject to review and approval of an SUP.

As the literature demonstrates, the number of people visiting a site can influence disturbance to wildlife. Larger group sizes customary of tours would likely increase some disturbance to wildlife on the Refuge during sensitive times of the day or seasons, particularly during the spring and fall migrations when the Refuge supports substantially more wildlife. There could be additional crowding along Center Patrol Road or at public use sites, which would increase vegetation trampling and localized impacts to habitats. Groups requesting special permission to access a habitat/wildlife sanctuary area not normally visited by the public could further increase impacts to sensitive wildlife. Individual commercial photographers would be expected to have the same minor impacts as non-commercial photographers, although filming or recording that involves additional equipment and set-up could have additional impacts on habitats and wildlife due to heavy equipment and/or increased sound levels. Overall the impacts are expected to be minor due to the large size of the Refuge, the availability of sanctuary closed to the public, and the small number of commercial groups and commercial photographers that visit the Refuge throughout the year.

To ensure commercial recreational uses are conducted in a manner compatible with the Refuge’s purposes and the National Wildlife Refuge System’s mission, an SUP would be required for all for-profit commercial uses occurring on the Refuge. This is expected to benefit both the users and the Refuge as it would aid users in understanding Refuge regulations and the purpose and mission of the Refuge and Refuge System. At the same time, it would provide the Refuge a tool for managing uses; protecting natural and cultural resources; reducing user conflicts; and gathering use information. The SUP would also create an opportunity for communication and outreach between the Refuge staff and commercial photographers or tour groups to increase knowledge and awareness of the Refuge’s habitat and wildlife, and disseminate information to users on ethical photography and wildlife observation behavior. Table B-15 details the special use permit requirements under Preferred Alternative 2.

**Table B-15. Special Use Requirements for Commercial Recreational Uses**

Who	Access to Open Areas	Access to Closed Areas	Access to Hunting Areas	Access to Fishing Areas
Commercial Photographers	<ul style="list-style-type: none"> <li>• SUP</li> <li>• No fee</li> </ul>	<ul style="list-style-type: none"> <li>• SUP</li> <li>• <i>Fee required</i></li> </ul>	<ul style="list-style-type: none"> <li>• No entry during hunting season</li> </ul>	<ul style="list-style-type: none"> <li>• SUP</li> <li>• No fee</li> </ul>
Commercial Tour Groups	<ul style="list-style-type: none"> <li>• SUP</li> <li>• No fee</li> </ul>	<ul style="list-style-type: none"> <li>• SUP</li> <li>• <i>Fee required</i></li> </ul>	<ul style="list-style-type: none"> <li>• No entry during hunting season</li> </ul>	<ul style="list-style-type: none"> <li>• SUP</li> <li>• No fee</li> </ul>

It is not expected that commercial photography and wildlife observation would cause any additional short-term, long-term and/or cumulative and indirect/secondary impacts other than those detailed above.

**Impacts to Listed Species:** There are no listed or endangered species on the Refuge. Greater sage-grouse (*Centrocercus urophasianus*) and the Great Basin Columbia spotted frog (*Rana luteiventris*) are designated as Federal candidate species for listing under the Endangered Species Act. Incidental post-breeding observations of sage-grouse have been made in recent years in the southeast portion of the Blitzen Valley. Spotted frogs have been documented in limited areas on the Refuge (Engle 2001; Pearl et al. 2010; Rombough and Engler 2010; ODFW 2011). But it is unclear at this time if the

Refuge population is part of the Great Basin distinct population, which is the Federal candidate species, or if they belong to the Oregon population.

Although the Refuge has occurrences of these candidate species, it is anticipated that impacts from commercial recreational uses would be negligible and would not be expected to increase disturbance to candidate species any more than non-commercial uses. Uses would continue to occur primarily at public sites and on designated roads and trails away from sensitive habitat and resources, and outside of breeding areas and seasons. Users would be required to apply for an SUP, and stipulations for reducing impacts to candidate species would be further covered by the permit. Public education or use of interpretation would assist in raising awareness and preventing undue impacts to these species. If uses result in unacceptable adverse effects to candidate species or habitats, the Refuge would impose restrictions to mitigate disturbance.

**Impacts to Other Priority Public Uses:** Commercial recreational uses generally result in little disturbance to other visitors. However, larger groups may cause crowding on roads and at public sites, which could impact the experiences of individuals and non-commercial users. Some tours may inadvertently flush game being pursued by bird hunters, but this conflict would be expected to be minimal as hunting areas would not be open to non-hunters during hunting seasons. There would be no conflict expected between anglers, non-commercial wildlife observers, or photographers. Careful scheduling with EE groups would be done to reduce any conflicts between groups and uses.

**Impacts to Infrastructure:** No significant effects to roads, trails, or other infrastructure from commercial photography and wildlife observation programs are foreseen. Normal road, trail, and facility maintenance will continue to be necessary. Additional facility construction or upgrade, if needed, is addressed in the Availability of Resources section.

## Public Review and Comment

Various opportunities were provided for the public to engage with the CCP planning process. Appendix J details public involvement undertaken during the development of the CCP/EIS. Written comments on this draft CD are welcome.

## Determination

Use is Not Compatible  
 Use is Compatible with the Following Stipulations

## Stipulations Necessary to Ensure Compatibility

### General Stipulations

- Visitors are restricted to designated trails, sites, or facilities as determined by Refuge staff. Use is open daily from dawn to dusk. Camping, overnight use, swimming, and fires are prohibited.
- Motorized vehicles would be limited to designated public roads and parking lots and must observe posted speed limits.
- Commercial photographers should ensure proper credit is given to the Refuge and the Service.

- Collection of natural objects such as plants, animals, minerals, antlers, and cultural resources are prohibited.
- If disturbance to wildlife or damage to habitat reaches unacceptable levels, the Refuge would limit uses in areas where unacceptable impacts occur. Monitoring will be conducted to ensure that high-quality habitat for wildlife feeding, resting, and breeding is maintained.

### ***Special Use Permit***

- An SUP would be required for all commercial photography and wildlife/nature tours and guiding on the Refuge. Guiding for hunting and fishing is not allowed on the Refuge.
- A standard permit form stipulating dates, times, and locations of use will be made available prior to the visit on the Refuge's website or by mail.
- SUPs for areas open to the public grant permissions to open areas for up to 1 year under the same use stipulations before renewal, and no fee is charged for the permit.
- Special permission requests to closed habitat/wildlife sanctuary areas or other special considerations (e.g., access to the Refuge after normal public visitation hours, setting up temporary equipment, requiring additional resources or staff) would require an SUP and permit fee, and would be granted on a case-by-case basis with no renewal.
- The SUP would be required to be readily available while conducting the permitted use on the Refuge.
- Requests must demonstrate a means to enhance education, appreciation, and/or understanding of the Refuge and the National Wildlife Refuge System. Failure to abide by any part of the SUP or regulations would be considered grounds for immediate revocation of the permit and could result in denial of future permit requests.

### **Justification**

By allowing commercial guiding and photography uses to occur under the stipulations described above, it is anticipated that wildlife species that could be disturbed during the use will find sufficient resources and resting places such that their abundance and use of the Refuge will not be measurably lessened. Additionally, it is anticipated that use of SUPs would provide the Refuge a tool for managing uses, protecting natural and cultural resources, reducing user conflicts, and mitigating disturbance impacts. The SUP would also create an opportunity for communication and outreach between the Refuge staff and commercial photographers or tour groups to increase knowledge and awareness of Refuge regulations and ethical photography and wildlife observation behavior. Thus, the use would not materially interfere with or detract from the Refuge System's mission or the purposes for which the Refuge was established.

This proposed activity contributes to the mission of the USFWS. Commercial guiding provides visitors an organized and educational opportunity to view wildlife safely under the use stipulations. Additionally, commercial photography, through educational wildlife media, creates end products that may provide an educational opportunity to a much broader distribution of people who may not have the opportunity to visit and personally view the Refuge's wildlife and resources. The media products produced by these commercial operations would also be beneficial in promoting the mission of the National Wildlife Refuge System.

It is determined that commercial photography and wildlife observation within the Refuge as described herein, will not materially interfere with or detract from the purposes of the Refuge or the mission of the National Wildlife Refuge System. The stipulations outlined above would minimize

potential impacts relative to wildlife/human interactions. The commercial recreational uses program is intended to foster a better understanding of Refuge wildlife and resources, and in turn build a public that is more knowledgeable about, and involved in, resource stewardship.

**Mandatory Reevaluation Date**

09/2022 Mandatory 10-year Reevaluation Date (for all uses other than priority public uses)

**NEPA Compliance for Refuge Use Decision**

X  Environmental Impact Statement and Record of Decision

**References**

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**Signatures:**

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## **B.7 Grazing and Haying Compatibility Determination**

**RMIS Database Uses:** Grazing; Haying or Ensilage

**Refuge Name:** Malheur National Wildlife Refuge

### **Establishing and Acquisition Authorities and Refuge Purposes**

- “ ... a refuge and breeding ground for migratory birds and other wild life ... ” Executive Order 7106, dated July 19, 1935, as modified by Public Land Order 1511, dated September 24, 1957
- “ ... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act)
- “ ... for the development, advancement, management, conservation, and protection of fish and wildlife resources ... ” 16 U.S.C. 742f(a)(4)
- “ ... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ... ” 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)
- “ ... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans ... ” 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

### **National Wildlife Refuge System Mission**

The mission of 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” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd et seq.]).

### **Description of the Use**

#### Purpose and Intent of Haying and Grazing as a Management Tool at Malheur Refuge

This CD examines haying and grazing as proposed under Preferred Alternative 2 of the draft CCP/EIS. Livestock grazing and haying have been used in the past at Malheur Refuge and are proposed to be used in the future as tools to provide optimum conditions for wildlife (specifically, foraging areas for waterfowl, waterbirds, and shorebirds; pairing habitat for waterfowl; nesting habitat for shorebirds; and nesting habitat for certain passerines) and, where possible, to improve biological integrity (native plant diversity; hereafter, restoration) in Refuge plant communities. A complete description of how grazing and/or haying is likely to result in these outcomes is contained in the section of this CD titled Anticipated Impacts of the Use.

#### Policies Pertaining to Use of Haying and Grazing on National Wildlife Refuges

**Administration Act:** Almost one hundred years after its establishment, the U.S. Fish and Wildlife Service’s National Wildlife Refuge System received organic (i.e., foundational) legislation that provided policy direction and management standards applicable to all refuges. This statute, the National Wildlife Refuge System Improvement Act of 1997 (P.L. 105-57) amended the National

Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee). In sharp contrast to the organic legislation of other Federal land management systems (e.g., National Forests administered by the U.S. Forest Service and Public Lands administered by the U.S. Bureau of Land Management), legislation pertaining to the NWR System states that it is not a multiple-use management system and is not managed for commodity production or on the basis of sustained-yield economic principles. Refuges are managed first and foremost for fish, wildlife, plants, and their habitats (Section 5, House Report 105-106). This is often referred to as the “Wildlife First” management mandate.

The Improvement Act also established a three-tiered hierarchy for management activities that occur on Refuge System lands. The first tier involves management actions that specifically assist the Refuge in fulfilling the purpose for which it was established (e.g., for migratory birds and other wildlife) and the Refuge System mission, including the conservation, management, and restoration of fish, wildlife, plants, and their habitats. The second and third tiers involve wildlife-dependent public uses (i.e., hunting, fishing, wildlife observation and photography, and environmental education and interpretation) and general public uses.

Management tools (such as grazing, haying, pest management, or burning) that help refuges achieve established refuge purposes become first-tier management priorities, when properly authorized through signed management plans and CDs. When management tools such as grazing and haying are not specifically used on a refuge to help achieve established refuge purposes, then these activities fall into the third, lowest priority tier.

**Compatibility:** All uses on National Wildlife Refuges must be deemed “compatible.” A compatible use is one that in the “... sound professional judgment [of the Refuge Manager], will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the Refuge” (603 FW 2.6 B). Among other things, a CD involves evaluation of a proposed use’s effects upon refuge fish, wildlife, plants, and their habitats; potential conflicts with other refuge uses, especially wildlife-dependent public uses; indirect, future, and cumulative effects; precedent-setting implications; maintenance and monitoring costs; and off-refuge opportunities to exercise the use in question.

**Regulations:** There are specific USFWS regulations that address economic uses of refuges. In 50 CFR 29.1, it is stated, in part, that “... we may only authorize public or private economic use of the natural resources of any national wildlife refuge, in accordance with 16 U.S.C. 715s, where we determine that the use contributes to the achievement of the national wildlife refuge purposes or the National Wildlife Refuge System mission.” This regulatory standard is in addition to the compatibility requirement. Grazing livestock and harvesting hay are listed in the regulations as example uses to which this provision applies.

### Use Details

**Habitats Subject to These Tools:** The primary habitat types where grazing and haying will be used are wet meadows (meadow habitats with standing surface water during the growing season), and reed canarygrass areas (an undesirable exotic wet meadow grass that has spread to dominate some Refuge fields). Livestock grazing may also be used when necessary to maintain or restore<sup>2</sup> other habitat

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<sup>2</sup> The term “restoration” is used generally in this document to specify an alteration of plant community dynamics such as plant species diversity, composition, etc., in order to meet wildlife habitat needs. It does not necessarily mean a return to conditions that may have existed at a certain time in history. Because many communities are novel

types (e.g., to transition undesirable plant communities to more native species and improve future habitat conditions).<sup>3</sup>

**Area Treated Annually:** As a starting point of implementing the CCP, a treated:untreated ratio of 60:40 ( $\pm 10\%$ ) will occur across the Refuge's 20,000 to 25,000 acres of wet meadow habitat type (see Appendix K). Hence, approximately 12,000 to 15,000 acres of wet meadow will be treated in initial calendar years. Actual treatment levels will vary on a field-to-field basis depending on area-specific objectives of focal species. For example, higher levels of treatment will typically occur to provide conditions most favorable for sandhill crane foraging and bobolink nesting (e.g., southern Blitzen Valley) and idle conditions will dominate where use of grass meadows for waterfowl nesting is emphasized (e.g., north of Warbler Pond in the Double-O Unit). This ratio and application may be adjusted as more information is gleaned through inventory and monitoring activities and analyzed by Refuge staff, the Ecology Work Group, and other collaborators (Appendix I).

***Habitats that will not be Subject to Grazing/Haying and/or Will be Protected from***

***Grazing/Haying:*** Objectives developed for cold and hot spring, dune, playa, riparian shrub, riverine and associated riparian zone, sagebrush lowland, sagebrush-steppe, and salt desert scrub habitat types do not include strategies recommending the use of haying and/or grazing as a part of land management within the CCP. The exception to this could be when a shift in community attributes is desired within a specific area of a particular habitat to meet overall wildlife objectives. One example may be the use of early growing season livestock grazing as a tool to reduce reproduction and influence the soil seed bank of cheatgrass before conducting a seeding effort to enhance native plant diversity on-site.<sup>4</sup>

Overview of the Four Treatment Types

Four treatment types will take place on the Refuge (i.e., rake-bunch grazing (RBG), grazing, haying, and mowing) during two pronounced periods (dormant versus growing season). Mowing is a pre-treatment that occurs prior to both RBG and haying.

a) *Dormant Season Haying and Rake-bunch Grazing*

***Desired Vegetation Condition:*** Dormant season hay only (HO) grazing and RBG will be used to meet desired characteristics of wet meadows across the Refuge as specified in Objective 4a (see Chapter 2), including an initial 60:40 ratio ( $\pm 10\%$ ) of treated:untreated meadows<sup>5</sup> with grass/sedge/rush stubble heights of less than 6 inches by October 1. Haying and RBG treatments during this time also play a vital role in maintaining site vigor by preventing excessive litter accumulation from hindering plant species diversity and expression (Foster and Gross 1998; Xiong et al. 2003). Plant species composition and the response of those species to site-specific conditions that

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(i.e., made up of either native and non-native species or native species outside historical spatial distributions), a return to such a state may not be preferable to the Service or the Pacific Flyway because such a shift may compromise the regional availability of suitable wetlands for waterfowl, waterbirds, etc.

<sup>3</sup> See Appendix K for further discussion on the decision-making process for habitat manipulation within the CCP.

<sup>4</sup> Interested public are encouraged to provide input and participate in discussions with the Ecology Work Group. Semi-annual meetings discussing habitat management and associated inventory, monitoring, and research are open to the public (Appendix K).

<sup>5</sup> As noted earlier, this ratio is subject to adjustment depending on level of treatments necessary to meet overall wildlife objectives across the Refuge's wet meadow habitat type. Adjustments would entail careful analysis of inventory and monitoring data as specified in Appendix K.

may change annually due to climate or refuge management have a significant influence on biomass production and subsequent litter production. Spatial RBG and HO treatments will be adjusted on an annual basis to account for these dynamics according to information gleaned from inventory and monitoring efforts.

**Timing of Treatment:** The majority of wet meadow habitats under the “dormant season” program will be mowed beginning August 10 when most meadow plant species are mature (quiescent) and preparing to enter into senescence (when aboveground biomass dies). From a wildlife standpoint, postponing mowing until this time reduces mortality rates of crane colts and other late-maturing species; mowing before this date is discouraged under the Greater Sandhill Crane Management Plan (Central Valley Population) (Pacific Flyway Council 1997).

Mowing would be followed either by RBG or HO treatment. RBG is a form of treatment where meadow hay is mowed and raked into windrows, but left in place to be consumed by livestock during the late fall and winter. RBG will take place beginning September 1 and may continue through January 31. Refuge staff will annually direct permittees in the amount of rake-bunch feed to prepare and its location before or during the August haying season. No windrows remain under HO, as all mowed vegetation is baled and removed from the Refuge.

**Ancillary Equipment and Infrastructure Necessary for the Use:** HO and RBG treatments require the use of equipment normally used for general haying activities (e.g., tractor, swather or rotary mower, rake) with the addition of balers for HO and specialized rakes for bunching windrows for RBG. All-terrain vehicles (ATVs) and horses are necessary for moving cattle efficiently across designated fields. RBG and experimental grazing treatments also require necessary infrastructure for livestock management, including permanent wells and associated stock tanks and permanent/temporary fences. Additional fencing requirements are expected to be minimal. Power lines are currently specifically associated with two wells in the northern Double-O Unit and two wells in Diamond Swamp. All other wells are serviced via generators or power lines serving outlying residences (e.g., Diamond, Frenchglen).

*b) Short-duration, High-intensity Experimental Dormant Season Grazing*

This treatment may take place in fields that would otherwise be rake-bunch grazed or mowed. In recent discussions with past refuge biologists<sup>6</sup> it was expressed that this may be useful in providing litter management necessary for species such as the bobolink while retaining some vertical structure. Timing and equipment used would be similar to RBG (except that no mowing equipment would be used). Any haying or grazing prior to these dates will be pursued under the growing season program.

*c) Growing Season Hay Only and Growing Season Grazing Treatments*

**Desired Vegetative Condition:** Growing season HO and the use of livestock in treating uncut vegetation (grazing) will be used to meet desired characteristics of wet meadows across the Refuge as specified in Objective 4a (see Chapter 2) by encouraging successional shifts in plant community composition where designated attributes (i.e., >75% cover of perennial grasses, rushes, and sedges; 15-20% cover of forbs such as lupine, clover, and cinquefoils; <20% cover of reed canarygrass ; <5% cover of noxious weeds) are not being met and maintaining desired habitat heterogeneity at larger spatial scales (e.g., conditioning reed canarygrass monocultures for fall migrating waterfowl or

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<sup>6</sup> This conversation took place during an organized Refuge management review involving current Refuge staff and the following former biologists: John Cornely, Gary Ivey, David Johnson, David Paullin, and Michael Rule.

encouraging a compositional shift from a reed canarygrass association to that of aquatic sedge). Growing season HO will be used as needed in an effort to control/eradicate noxious weed populations in meadows that have exceeded designated site-specific thresholds based on plant community attributes and associated abiotic resources (e.g., soil type). HO will be effective in preventing the maturation of viable weed seed (e.g., mid-June), thus reducing further enhancement of the soil seed bank in this instance. An example of this is the mowing of pepperweed in mid-June, prior to the production of viable seed.

**Timing of Treatment:** “Growing season” treatments will typically occur April through August, but may extend past the period of senescence depending on site-specific objectives. Manipulation of vegetation during the growing season can have negative effects on wildlife due to disturbance/displacement. Littlefield (1989) documented sandhill crane nest desertion and trampling with spring and summer grazing. Therefore, growing season treatments will be pursued when the need for a shift in vegetative community attributes or structural heterogeneity is necessary within a particular unit to meet overall long-term meadow habitat objectives.

**Ancillary Equipment and Infrastructure Necessary for the Use:** Growing season grazing may use existing dormant season infrastructure, but will most commonly use electric fencing and/or other temporary fencing to control livestock movement. Temporary water will be provided as needed.

### Livestock Trailing

When the movement of livestock is necessary, routes will be carefully selected to prevent damage to cultural resources, sensitive soils, wildlife habitat availability and integrity, and plant community health. A description of prescribed livestock movement will be included within individual cooperative land management agreements (CLMAs) (see below).

### Corrals

Corrals facilitating livestock movement on- and off-Refuge (Diamond and Nine Mile) by Refuge permittees are also used by BLM permittees using neighboring BLM allotments. The existing cooperative agreement placing responsibility of all maintenance of related infrastructure on the BLM will be extended.

### **Administration of the Use**

**Cooperative Land Management Agreements:** The two programs using haying and grazing (dormant season and growing season) will be treated separately and will differ in the types of agreements that are used. Both programs will use CLMAs as authorized under 50 CFR 29.2. These agreements will allow Refuge staff and permittees to effectively work together to meet habitat objectives (e.g., feeder ditch maintenance, noxious weed management).

**Dormant Season CLMAs:** The CLMAs for dormant season treatments (i.e., haying and RBG) will be 5 years in duration,<sup>7</sup> will designate acreages of use, and will allow payment in the form of services (permittee labor and equipment or cost of contractor) or the financing of field management activities such as noxious weed control. The labor involved in installing and maintaining field fences

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<sup>7</sup> The duration of dormant season CLMAs may be adjusted in subsequent agreement cycles on a case-by-case basis if it is demonstrated that the 5-year timeframe does not prove adequate (either too short or too long) in understanding plant community trends and the Refuge’s ability to respond appropriately to community dynamics.

(permanent or electric) is a condition of the permit and will not be deducted from the bill, although materials will be provided by the Refuge. A percentage of each invoice will go toward funding (1) noxious weed management and (2) a third-party entity that will be active in Refuge land management research, inventory, and monitoring. Designated acres will involve target habitats within field management units (e.g., Oliver Springs Field) and CLMAs will designate necessary rotations if a complex of fields is included in the agreement.

Existing permittees<sup>8</sup> will be provided an identified acreage in which vegetation management activities will take place. If objectives pertaining to individual units within this acreage are not being achieved as determined through the state-and-transition model (STM) process, adjustments will be made within the areas included in the agreements.

The overall treatment of each CLMA land base will be analyzed annually by the Ecology Work Group, and appropriate changes to the CLMA agreement will be made at the end of the contract period. This provides opportunities each year to make changes based on habitat trends within the conditions expressed in the CLMA. If inventory, monitoring, and analysis reveal that the conditions of individual agreements are not sufficient for meeting or maintaining habitat objectives at the conclusion of the 5-year CLMA time frame, then the nature of the specific CLMAs may either be altered (e.g., replacing RBG with HO) upon renewal or the Refuge may choose not to renew them. Permittees and interested public will have the opportunity to participate in semiannual Ecology Group reviews of the Inventory and Monitoring Program, thus enabling all interested parties to fully engage.

***Growing Season CLMAs:*** Growing season treatments (e.g., successional plant community management, creation of shifting mosaic of successional stages) will use annual CLMAs to maximize flexibility in response to changing needs as driven by research or specific management goals addressing particular management issues (e.g., encouraging one suite of plant species at the expense of another). Annual CLMAs will be applied in designated areas, will specify the objective vegetation condition, and will be subject to monitoring to evaluate the treatment prior to renewal. Exchange of services and other aspects of annual CLMAs are the same as those of 5-year CLMAs. Cooperators who are able to demonstrate flexibility in providing livestock and associated labor (intensive herding, etc.) to allow site-specific treatments on an annual basis will be sought for annual CLMAs. If unforeseen circumstances take place (e.g., weather-related phenomena), mid-year modifications to CLMAs may take place if the rationale is documented through the Ecology Work Group process. Further information regarding oversight of habitat responses related to CLMAs through the state-and-transition model and the Ecology Work Group is found in Appendix L. The costs of administering and managing the haying and grazing program under Preferred Alternative 2 are detailed in Table B-16.

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<sup>8</sup> Permittees currently possessing annual haying and grazing Special Use Permits (SUPs) will be issued 5-year CLMAs upon implementation of the CCP.

**Table B-16. Costs to Implement the Use**

Category and Itemization	One-time Expenses(\$)	Recurring Expenses (\$/yr)
Administrative support	\$0	\$35,000
Materials and equipment	\$0	\$0
Offsetting revenues/services	\$0	\$170,000
<b>Total expenses for the complex</b>	\$0	–(\$135,000)

**Ecology Work Group Role:** As discussed in Chapter 2 of the Refuge’s CCP, regular assessment and modification will be made possible through the Malheur STM framework. This involves the development of site-specific management strategies (using a combination of tools) to meet vegetative objectives (such as desired structural and successional characteristics) as laid out in the STM. The Ecology Work Group, consisting of ecologists and wildlife biologists representing agencies, academia, and other ecologists, will assist the Service in the development of the model and will provide recommendations for annual modifications to the model and associated habitat management strategies based on continuous inventory and monitoring. The structure of this information gathering and land management decision process is designed to provide transparency in the Refuge’s decision-making process.

**Anticipated Impacts of the Uses**

Grazing/Haying Effects to Wildlife

Table B-17 lists the wildlife species that depend on treated meadows for particular life history stages. Wet meadows can provide both nesting and foraging sites for avian species. Both are discussed below.

**Spring Foraging Habitat During Migration:** The primary reason for treating wet meadows is to improve foraging conditions, especially during the pairing season. Wet meadows receive high use by foraging birds in the spring when they are treated with grazing, haying, or burning. These treatments provide short-stubble habitat, which allows early warming of soil and water and early availability of new green sprouts and invertebrates for birds to eat in the spring. This short structure proves valuable as a foraging area for waterfowl, waterbirds, and shorebirds. Important species such as sandhill cranes, white-faced ibises, and many waterfowl focus their foraging on these areas.

While much of the migrant waterfowl use occurs on the Refuge lakes, many migrant birds are attracted to the hayed and grazed meadows after they are flooded in the spring. Treated meadow vegetation (mowed, grazed, burned) provides high-protein browse and invertebrate foods for a large variety of birds and other wildlife during the early spring period, when high-protein foods are needed for egg-laying. Theoretically, treated meadow sites receive more solar radiation, resulting in early warming of soils and earlier availability of important invertebrates for food (Rule et al. 1990). These treated meadow sites on Malheur Refuge generally support high waterfowl and crane use during the early spring period. In particular, the Double-O Unit receives very high use in March and April by migrating snow geese, Ross’ geese, ducks, and sandhill cranes, and is very important to these species during dry years, because little feeding habitat is available elsewhere in the basin (David and Ivey 1995). Therefore, Malheur Refuge plays a critical role in providing energy for migrating birds within the Pacific Flyway, and management of wet meadows by haying and grazing is a means of providing

much needed energy for these birds to continue migration and replenish their nutritional reserves. Successful reproduction upon arriving at breeding grounds depends on the quality and quantity of food acquired at such stopovers (Davidson and Evans 1988; Ricklefs 1974).

***Nesting Habitat for Waterfowl and Waterbirds: Pairing and Pre-Nesting:*** A study of Malheur Refuge land use in relation to spring waterfowl pair use was initiated by Gary Ivey in 1988. Paired plots of different land use were established, and waterfowl were counted weekly during April and May using a four-wheeled motorcycle, which flushed nearly all birds within each transect; therefore, detectability was considered close to 100 percent for all land use types. One set of plots comparing RBG and idle management was established in 1990. A preliminary analysis of data from these two paired, 800-hectare plots showed duck numbers to be, on average, six times higher in April and two times higher in May on the grazed plot in comparison to the idle plot. Also, Canada goose counts were 17 times higher on the grazed plot versus the idle plot (Ivey, unpublished data). Duck pairs used wetlands that had been treated (burned, grazed, or mowed) earlier in the season than wetlands with idle vegetation, which showed increased pair use later in the season. Theoretically, treated areas receive more solar radiation, and therefore, frozen soils thaw much earlier than non-treated areas, resulting in earlier plant growth and earlier availability of invertebrate foods (Rule et al. 1990). The new plant growth and invertebrates are sources of protein, which is very important to breeding waterfowl and other birds for egg-laying, as described by Eldridge and Krapu (1988).

The past Refuge strategy has been to treat most of the wet meadow habitat with haying and/or winter livestock grazing to reduce the attractiveness of these habitats for nesting ducks, because early nesting species like mallards often nest in wet meadows before irrigation water is present and many of their nests get flooded during irrigation and with flood events—as such, nests generally don't float like they do in marsh vegetation. Often, mallards will select alternate overwater nesting sites and build floating nests in marsh vegetation. Most ducks, geese, and cranes select marsh sites for nesting within large, wet meadow areas of the Refuge (e.g., Units 11 and 12). Refuge studies of duck nest success have documented much higher success for ducks nesting over water in marsh plant communities than for ducks nesting in meadows or uplands (Malheur Refuge, unpublished data). Although some species focus primarily on nesting in meadow habitats (e.g., cinnamon teal, northern pintail, short-eared owl), treating the wet meadow sites encourages these species to nest in dry meadow (which are sub-irrigated), upland (e.g., sagebrush lowlands, salt desert scrub), or marsh habitats by managing wet meadows for low structure in early spring.

***Shorebird Nesting and Migratory Habitat:*** Shorebirds and other migratory species that depend on wetland stopovers in North America are being challenged by a rapidly changing landscape. For example, in the Great Plains of North America, 90 percent of the wetlands in some areas have been lost to agricultural development since the early 1900s (Ducks Unlimited 1994; U.S. Department of the Interior 1994). Furthermore, wetlands may be altered in the future by global warming (Houghton et al. 1990; Poiani and Johnson 1991). Such large-scale habitat changes raise concerns about maintaining an adequate network of stopover habitats in the future (Farmer and Parent 1996).

Nine species of shorebirds regularly breed at Malheur Refuge, including snowy plovers, long-billed curlews, Wilson's phalaropes, American avocets, and black-necked stilts, which are all priority species in the Intermountain West Regional Shorebird Plan (Oring et al. 2000). Estimates of breeding populations of common species in the Harney Basin from 1975 to 1978 are provided by Horton et al. (1983).

The short structure of treated meadows is attractive to nesting shorebirds such as Wilson's snipe, Wilson's phalarope, American avocet, and black-necked stilts, as well as some ground-nesting passerine birds such as bobolink and savannah sparrow.

Most shorebird species select very short cover or barren sites for nesting (Eldridge 1992). Little information has been published on management of breeding shorebirds in the Intermountain West. However, a Malheur Refuge study of ground-nesting birds in the Double-O Unit found that in all cases, shorebirds used shorter and sparser vegetation than ducks, primarily nesting in bluegrass/creeping wildrye associations (Foster 1985). In these habitats, Foster found high densities of nesting shorebirds when they were livestock-grazed and high densities of nesting ducks when they were untreated; he recommended using livestock grazing or mowing to enhance attractiveness of that vegetation type to nesting shorebirds. Other authors have also identified that essential habitat for breeding shorebirds can be provided through grazing, mowing, or prescribed burning (Eldridge 1992; Helmers 1992). Therefore, to provide short cover needs in areas of the Refuge important for shorebird nesting (e.g., the north end of the Double-O Unit), wet meadow vegetation should be treated with livestock grazing, mowing, or burning after the breeding season (Ivey et al. in prep.).

**Greater Sandhill Cranes:** Greater sandhill cranes are considered a "Sensitive Species" in Oregon and are also a "Strategy" species in the Oregon Conservation Strategy (ODFW 2006). These birds are members of the Central Valley Population and their management needs are addressed in a Pacific Flyway plan (Pacific Flyway Council 1997). They are also identified as a priority species in the Intermountain West Waterbird Conservation Plan (Ivey and Herziger 2006). Malheur Refuge supports a significant portion of Oregon's population of breeding greater sandhill cranes, with over 20 percent of the state's pairs found there during surveys in 1999 (Ivey and Herziger 2000).

Three essential ingredients for a crane nesting territory were outlined by Littlefield and Ryder (1968); a feeding meadow, nesting cover, and water. Territories averaged 43 acres at Malheur Refuge and contained irrigated meadow for feeding and flooded marsh cover for nesting. An ideal territory contains a shallow marsh with residual emergents in close proximity to foraging meadows (Littlefield and Ryder 1968). Feeding cranes have a preference for mowed meadow habitats when compared with unmowed (Littlefield 1975).

Only 8 percent of the crane nests documented on the Refuge have been in meadow vegetation (Rule et al. 1990). The primary importance of meadows to cranes is for feeding and brooding young. Radio telemetry studies conducted on the Refuge showed that the wet meadow zone adjacent to uplands is a preferred area for crane chick brooding (Littlefield 1985). This preference is assumed to be associated with invertebrate abundance and availability. Generally, cranes are attracted to intensely treated meadows (mowed, burned, or rake-bunched grazed) for feeding during early spring. These intensive treatments remove ground cover, allowing solar radiation to warm the soil, causing earlier green-up of vegetation and earlier invertebrate availability (Epperson et al. 1999; Rule et al. 1990).

Cranes initiate nesting when their territories are adequately flooded and the females have consumed enough protein to begin egg-laying. Cranes nest early in fields that are irrigated early and later in fields that are flooded late. Nest initiation is also affected by land use treatments because treatments that remove ground cover (burning, grazing, haying) result in earlier soil warm-up and availability of protein-rich invertebrate foods. Cranes nest earliest in burned areas, followed by mowed and grazed areas, and they nest latest in idle areas (Littlefield 2010, personal communication). A study was conducted at Ash Creek Wildlife Area in California, where habitat is similar to the Blitzen Valley's (Epperson et al. 1999). That study compared bird use on hayed (previous summer) versus idle plots

and documented significantly higher numbers of individuals and species of birds as well as significantly higher numbers of sandhill cranes on hayed plots during June and July. The study also reported that cranes in hayed plots spent significantly more time foraging and less time in vigilant behaviors as haying likely increased their ability to see approaching predators. They reported that because vegetation was less dense in the hayed plots, travel, foraging, and vigilance by cranes would be more efficient and the reduced litter and vegetation cover enhanced the ability of cranes to find and capture prey, supporting the idea that providing short-stubble habitat benefits cranes and other wildlife foraging.

An evaluation of Refuge crane nest success from 1990 to 1998 revealed that success was lower the season following a burn, declined with nest initiation date, and was higher in deeper water sites. It also revealed that haying, livestock grazing, or predator control did not influence success during those years (Ivey and Dugger 2008). The study found no evidence for haying, grazing, or idle treatment effects on crane nest success, which is similar to the findings of a study at Grays Lake National Wildlife Refuge in Idaho (Austin et al. 2002). The significance of higher nest success for early nests suggests that providing early water and ideal foraging habitats (treated meadows) can encourage early nesting, leading to increased success. Also, haying and grazing of wet meadows can encourage cranes to nest in the deeper marsh sites, where success is higher.

**Bobolink Habitat:** Bobolinks are identified as a focal species in the Partners in Flight conservation plan for eastern Oregon and Washington (Altman and Holmes 2000), and Malheur Refuge supports the largest local breeding population of bobolinks in the western United States. Bobolinks are a wet meadow–dependent landbird species and tend to nest in shorter vegetation types.

Malheur Refuge bobolink populations were monitored annually from 1984 to 1998 (Malheur Refuge, unpublished data). A preliminary review of the data indicates that bobolinks select treated wet meadows in suitable areas of the Refuge with a high composition of forbs such as cinquefoils and clovers. Such fields that were placed in idle status were abandoned by bobolinks, and the data suggest that they respond positively to haying, grazing (dormant season), and burning treatments. Other studies support their preference for grazed or hayed areas. Johnson (1997) reported that if habitat is not maintained, use by bobolinks significantly declines, and that bobolink use peaked 1 to 3 years after burns and began to decline about 5 years post-burn. Several authors report that bobolinks respond positively to burning or mowing treatments (Bollinger and Gavin 1992; Dechant et al. 2003; Herkert 1991, 1994; Johnson 1997; Madden 1996; Madden et al. 1999; Renfrew and Ribic 2001). A Saskatchewan study reported that bobolink abundance was higher in mowed tame hayland than in idle native grassland (Dale et al. 1997). Recommendations for bobolinks in the Great Plains provided by Dechant et al. (1999) include providing hayland areas and delaying mowing as much as possible. Therefore, managing Refuge wet meadow sites where habitat is suitable for bobolinks (based on past surveys) using haying, RBG, and burning is appropriate to provide breeding habitat for this species.

**Table B-17. Wildlife Species that Depend on Treated Meadows for Particular Life History Stages**

Wildlife Species	Use of Treated Wet Meadow
American avocet	Nesting/foraging
Black-necked stilt	Nesting/foraging
Bobolink	Nesting/foraging

Wildlife Species	Use of Treated Wet Meadow
Canada goose	Foraging
Mallard	Foraging
Sandhill crane	Foraging
Savannah sparrow	Nesting
White-faced ibis	Foraging
Wilson’s phalarope	Nesting/foraging
Wilson’s snipe	Nesting/foraging

**Effects of Treatment Timing to Breeding Birds:** Early mowing of vegetation has conflicted with production and maintenance objectives by destroying nests, killing incubating hens, killing young before fledging, and exposing nests and young to predators. Mowing could potentially impact any bird that nests or rears young in wet meadow habitats. Young cranes have the habit of lying still in meadow vegetation rather than moving away at the approach of a swather. Delaying Refuge haying dates until August 10 (as is practiced currently) will minimize mowing conflicts.

Grazing livestock, haying, and mowing during the growing season may disturb/displace nesting activity for that year from a particular field unit, but at any one time would only impact a small percentage of the available wet meadow habitats available within the Refuge.<sup>9</sup>

**Reed Canarygrass:** Although this species actually occurs in plant communities within the wet meadow habitat type, it is significant enough to merit attention in this discussion. Large areas of robust reed canarygrass stands are essentially biological deserts in terms of wildlife use, as they quickly become too tall and rank and exclude most species. Currently about 6,000 acres<sup>10</sup> of the Refuge wet meadow communities are dominated by such stands. Intensive treatments such as haying and grazing to keep the stubble height as short as possible will greatly improve wildlife use of these areas, and they should be treated annually until they are restored to more desirable and diverse communities.

**Effects from Fences and Infrastructure:** Electrical lines are a direct mortality source for cranes and other wildlife. Power line strikes are a major mortality factor for larger birds such as cranes and trumpeter swans as well as many other birds.

The Refuge has removed a vast majority of lines not associated with rural power distribution. Orange plastic spheres and reflective tags placed on some existing power lines where mortalities have occurred in the past have reduced collisions significantly. The stipulation below to bury the electric lines should mitigate somewhat against these hazards.

Fencing can interfere with the movement of wildlife or create entanglements, leading to mortality or altered movements for birds and mammals (Christianson 2009). In a 1-year study in Colorado and Utah surveying 1,046 kilometers (km) of fences, Harrington and Conover (2010) measured ungulate

<sup>9</sup> If a 500-acre wet meadow is used for habitat treatment within the growing season, this only accounts for 2 percent of this meadow habitat type being impacted.

<sup>10</sup> Locations of reed canarygrass monocultures is being mapped during the 2011 field season as specific wet meadow plant communities are identified spatially.

mortality rates at 0.25 mortalities/km for the wire fences studied, with 0.08 mule deer mortalities/km, 0.11 pronghorn mortalities/km, and 0.06 elk mortalities/km. Mortalities were highest in August, when fawns were weaned, and juveniles were eight times as likely as adults to suffer mortality.

In past years, biologists have found several chicks killed from fence entanglement, as well as many deer and antelope, at Malheur Refuge (Ivey 2011). Avian fence collisions are most common in areas where fences cross marshes. However, the Refuge now uses smooth wire as the bottom wire on all fences, and this is placed at a standard height to minimize impacts to pronghorn antelope.

Observations at the Refuge have confirmed that with these adaptations most pronghorn cross under the fences rather than through them. In addition, bird flight patterns have been considered when building fences, and many fence lines have been moved or removed to minimize the number of bird strikes. Therefore, though some fence impacts should be expected, overall, infrastructure effects from grazing would be considered relatively minor.

***Effects to Other Wildlife (small mammals, large mammals, fish, herps, inverts):*** There will be negative impacts to some small mammals, reptiles, and amphibians. Not only are these species subject to mortality from machinery, but the conversion of tall pasture grasses to mowed grasses results in habitat loss. However, at any one time, approximately 40 percent of the wet meadow habitat will be in an idle (untreated) condition, which allows for habitat use by species dependent on this condition.

***Disturbance Effects:*** The use of noise-producing equipment such as ATVs, tractors, swather or rotary mowers, rakes, and other potential equipment may cause localized disturbance to wildlife during the period of the equipment use. Oregon law restricts noise emissions from ATVs to 99 dB (OPRD 2011). In general, use of equipment will occur in the fall and thus occurs outside of the sensitive breeding period. In addition, most of the areas that will be accessed with equipment would be dry at this time of year, with reduced wildlife densities.

***Potential for Injury:*** Based on Malheur data, 75 percent of sandhill crane chicks are fledged by August 10. The remaining 25 percent unfledged chicks (typically five chicks per year) are vulnerable to haying mortality. Haying attracts coyotes and other predators, and unfledged chicks around hayed fields tend to be taken by predators (Ivey 2011). The stipulations outlined below should help reduce risk of mortality for the remaining chicks.

#### Effects to Vegetation: Short-term and Long-term

***Wet Meadow Plant Community Composition:*** Wet meadows are ideally dominated by native grasses (e.g., American sloughgrass, spike bentgrass), sedges, rushes, and native forbs and are commonly found interspersed within marsh and upland complexes. On the Refuge, wet meadows are currently dominated by introduced pasture species such as smooth brome, meadow foxtail, orchardgrass, reed canarygrass, and various clovers. Because meadows hosting a larger percentage of grasses provide more tonnage and higher nutrition for livestock, forage species such as timothy and smooth brome were introduced (decades ago). Other species were either introduced to the area in contaminated hay grown in other areas (e.g., meadow foxtail) or were purposefully planted because native meadow plants were generally believed to be less resilient, productive, and responsive to intensive land management. As a result, the diversity of native plants in some of these areas has decreased

substantially, and restoration is emphasized in land management objectives 4A, 4B, and 4D, which strive to improve the biological integrity of plant communities.<sup>11</sup>

***Differentiating between Riparian and Wet Meadow Habitats:*** The CCP distinguishes between riparian and wetland habitat management. As laid out in Goal 3 of Chapter 2, livestock grazing will not generally occur in areas designated “riparian” (e.g., streamside riparian zones and riparian woodlands). For this reason, issues such as stream bank integrity, willow propagation and enhancement, cattle distribution concerns relating to the inclusion of riparian areas in upland paddocks, and so on, are not addressed in this analysis.

Wet meadows and woody riparian areas are managed for different wildlife objectives. The former provides habitat for pairing/nesting/foraging waterfowl, waterbirds, shorebirds, and so on, while the latter is managed for willow-dependent landbirds. The different habitat requirements of yellow warblers and bobolinks illustrate this point well. Yellow warblers require large, dense willow stands while bobolinks seek out large, open, treated meadows for nesting. Wet meadow and riparian habitat types do have much in common, however, and these commonalities (e.g., plant community composition, plant species response to defoliation) will be addressed below.

How a plant community responds to defoliation is greatly affected by the compounding influences of its environment (e.g., climate) as well as the physiology of individual plant species and the influence this has on fitness at the individual plant and community levels. Unfortunately, as discussed earlier, many individual species have not been studied to an extent that would be helpful in truly comprehending how individuals and composite communities will respond to various management scenarios.

It is also important to note that studies pertaining to rangelands, mixed-grass and tall-grass prairies, woodlands, and narrow riparian meadows may or may not be relevant to the habitats being considered at Malheur Refuge. Basic principles can and do apply to all the above-mentioned systems, but one must be careful how conclusions are drawn when premises are built on habitat types that are different than the Refuge’s wet meadows. A vast majority of the research that is cited below has taken place in riparian areas adjacent to streams or in small riparian meadows west of the Rocky Mountains or within laboratory environments.

***The Dominant Role of Hydrology in the Expression of Plant Communities:*** A driving factor that separates wet meadows from other habitat types often discussed in grazing-related literature is hydrology. An overview of existing literature indicates that water table characteristics (i.e., soil moisture availability) are the most important factors influencing the composition and distribution of plant species in mesic and wet meadows (e.g., Allen-Diaz 1991; Dwire et al. 2006; Henszey et al 1991; Martin and Chambers 2001, 2002; Perata and Alpi 1993; Rumburg and Sawyer 1965; Stringham et al. 2001). Thus it is critical to consider the underlying influence of hydrology whenever plant community responses to livestock grazing are being considered. Ultimately, the net effect of any disturbance (e.g., flood irrigation, grazing) is often a function of its interaction with other disturbances.

Considering the influence of anaerobic conditions on plant communities, Dwire et al. (2006) found that small changes in water-table depth could result in either a short-term shift in species dominance or the ultimate replacement or loss of certain species. Water sedge (*Carex aquatilis*) can readily

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<sup>11</sup> The reader is referred to Chapter 2 of the Refuge CCP for further elaboration of these objectives.

transport oxygen through aerenchyma (Perata and Alpi 1993) and can persist in anaerobic conditions that would exclude other sedge species over time (Gomm 1979). Baltic rush (*Juncus balticus*) has a greater range of drought tolerance than many other rushes, and may not be as negatively impacted by long-term drying trends that would exclude other rush species.

Unfortunately, with a few noted exceptions such as those found above, there is a considerable knowledge gap regarding a majority of individual species' tolerance to water-table depth and associated anaerobic conditions. It is also difficult to categorize level of water tolerance by genus or other human-made classifications because of significant differences between species (e.g., aquatic versus Nebraska sedges). Many species have broad ecological amplitudes and do quite well in typical wetland settings as well as more "terrestrial" habitats (Tiner 1991).

There is, however, enough existing data to begin addressing Refuge management strategies from a scientific basis. It has been observed that timing and duration of soil saturation during the growing season can determine the distribution and abundance of Nebraska sedge (*Carex nebraskensis*) and Kentucky bluegrass (*Poa pratensis*) in riparian meadows (Kluse and Allen-Diaz 2005; Martin and Chambers 2001). There is also a positive correlation between soil aeration and species abundance, and anaerobic conditions can negatively influence total plant cover and species diversity (Dwire et al. 2006). Stem density of some wetland obligates may decrease without adequate soil aeration during the growing season (e.g., beaked sedge in Mornsjo 1969). Flooding depth and duration may negatively impact sedges and grasses, while allowing rush populations to expand (Gomm 1979; Rumburg and Sawyer 1965). Henszey et al. (1991) found that 7 to 10 cm (2-4 inches) of standing water during spring flooding, with a maximum water-table depth of -30 to -90 cm (-11 to -35 inches), was enough to create a shift to a wetter meadow plant community and a decrease in the presence of tufted hairgrass (*Deschampsia caespitosa*).

Water-table-driven thresholds are particularly difficult to determine, partially due to a general lack of species-specific data and the large degree of overlap that can occur among species (Dwire et al. 2006). Summarizing existing data and knowledge about the physiology and response of specific plant species (i.e., presence or absence of aerenchyma) may assist in the creation of general water management guidelines. This could serve as a foundation for managing water-table depths at the peak of growing season according to requirements of dominant species within particular guilds.

Because water table and topography play such a decisive role in determining the composition and dynamics of meadow and wetland habitats on the Refuge, the Ecology Work Group has already begun constructing the STM using hydrology as its foundation. Depending on the availability of water, one soil type may host either a hemi-marsh or a mesic meadow. The key to understanding the roles and impacts of haying and grazing during the life of the CCP is remaining mindful that these treatments interact strongly with site-specific hydrological regimes.

***How the Use of Grazing During the Growing Season can be Valuable in Meeting or Maintaining Wildlife Habitat Objectives:*** The concept of scale is critical in discussing the role livestock play in managing biodiversity within the Refuge's wet meadow habitats. Taken as a whole, these meadows encompass a diverse assemblage of plant community types consisting primarily of novel communities.<sup>12</sup> Within specific areas, however, a lack of species diversity is often problematic,

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<sup>12</sup> Novel plant communities consist of species assemblages that did not naturally occur prior to the introduction of desirable and undesirable exotics. Many novel communities are able to function in a similar manner to native communities (e.g., promotion of soil stability, watershed function, distribution of nutrients and energy) and provide

especially for wildlife such as the bobolink, which depends on a wide assortment of plant species to carry out their annual reproductive cycles (Wittenberger 1978, 1980). As discussed earlier, topography plays a significant role in determining depth to water table and provides a foundational template in guiding the potential expression of multiple grass, sedge, rush, and forb species. Within the wet meadow complex we discover the highest potential for diversity within mesic areas that are subirrigated for a majority of the growing season. Lower-lying areas are negatively predisposed to diversity due to extended anaerobic conditions and the limited number of species that are able to cope with an oxygen-limited environment. The following discussion is primarily mindful of mesic sites within this habitat type, although some points are relevant to sedge- and rush-dominated communities where introduced forage species such as reed canarygrass overtake desirable natives.

When let loose to graze on actively growing vegetation, livestock are capable of inducing a series of biological and physiological modifications that can drive changes in function at the individual plant scale. Grazing can also alter the expression of plant populations, leading either to an increase or decrease of biomass production at the community or ecosystem scale (Dyer et al. 1993) or in the number of plant species that are expressed (Leege et al. 1981). Cattle effects on vegetation should always be examined at various scales, including (1) the effect upon continuous changes in resource allocation and the phenological/morphological/physiological<sup>13</sup> responses and adaptations of individual plants; and (2) the effect upon plant community attributes such as plant species abundance, distribution, diversity, and overall habitat structure. These considerations should take place in a context that recognizes the influence of local hydrological dynamics and prevailing soil properties (e.g., depth to restrictive layer, pH, texture). Such an approach will allow Refuge staff and partners such as the Ecology Work Group to establish management strategies that are likely to succeed in attaining or maintaining desired conditions.

It is important to remain mindful that overarching conclusions are difficult to apply across the landscape because herbivory affects the same species differently across various sites and any generalizations would require an attempt to replicate responses in different areas (Belsky 1992). Kauffman et al. (1983) stressed the importance of recognizing and differentiating between plant community types: “Because of the great community diversity and differing ecological tolerances of riparian plant communities, a management practice that may be beneficial for one community may not be beneficial to another community in the same area.”

***Physiological Responses of Vegetation to Grazing During the Growing Season:*** Research conducted on numerous forage grasses has demonstrated that herbivory has an immediate effect on the functionality of individual plants during the growing season. A temporary cessation of root elongation (Crider 1955) and decreases in root respiration and nutrient acquisition (Davidson and Milthorpe 1966) can occur within 24 hours. Crider (1955) noted that there was a relationship between the percentage of foliage removed and the percentage of roots that ceased growing for a time. Richards (1984) concluded that a “reduction of root growth following defoliation appears to be an effective mechanism to aid reestablishment of the photosynthetic canopy and the root:shoot balance.” Briske and Richards (1995) believed that such alterations and reductions are an important adaptation to chronic defoliation and associated reduced entire-plant photosynthetic rates. The findings of Kauffman et al. (2004) illustrate this overall concept well. They examined the overall

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satisfactory habitat for wildlife. Others become monotypic over time and become less diverse than site potential would otherwise merit.

<sup>13</sup> Physiology refers to how a plant functions at various levels (e.g., growth rate, hormone production). Phenology examines the relationship between a plant’s growth and reproductive cycle in response to environmental conditions. Morphology considers the various forms and structural components of plants.

impact of belowground root biomass in response to herbivory and found that although there was no difference between plots in the distribution of root biomass by depth, root biomass was consistently higher in volume in non-grazed sites. Similar research conducted on aquatic sedge in a tundra setting yielded different results, finding that two or more defoliation events were required before root growth was reduced. Respiration and nutrient absorption rates were either maintained or increased for this species in relatively infertile conditions (Chapin and Slack 1979).

The complex relationship between physiological responses to defoliation and the overlying influence of temporal and spatial scales give testimony to the nonlinear nature of these interactions. In addressing the nonlinearity of these responses, Dyer et al. (1993) noted that metabolic activity and growth and development rates initially increase directly following a defoliation event until a maximum level of all three characteristics is attained. Once this level is reached, production potential decreases with sustained or increased levels of grazing (see also De Angelis 1992; Dyer et al. 1986; Dyer et al. 1991). Competitive interactions between species could be influenced by the level at which individual species would plateau in this way. These findings suggest that the desirable timing, duration, and location of prescribed grazing will differ dramatically based on the treatment's effect on the competitive abilities of desirable and undesirable plant species.

***Considering Plant Morphology:*** Belsky (1992) confirmed the importance of plant morphological expression in determining the influence of grazing upon plant competition in a diversity of Tanzania grasslands. She noted that tall perennial species increased and short perennial species decreased when grazing was removed from her plots. Across all plots, cessation of grazing led to an increase in species dominance and a decrease in species diversity. She concluded that short, sexually reproducing species were overtopped and crowded out by tall, vegetatively reproducing species. When grazing effects were examined, she found that the reverse was true.

This research is consistent with the general understanding that has been developed regarding plant morphological relationships with defoliation as related to tillering rates, shoot length (and associated meristematic tissues),<sup>14</sup> and the presence or absence of asexual reproduction (rhizomes and stolons). Considering such holistic relationships, Belsky concluded that herbivory response is different when one plant is affected versus multiple plants and that intraspecific and interspecific competition are critical components of the outcome of these interactions.

***Responses of Plant Communities to Grazing:*** Research has demonstrated that grazing may encourage competition by reducing enough biomass (cover and density of prevailing vegetation) to release available resources (Briske 1991; Damhoureyeh and Hartnett 1997; Kluse and Allen-Diaz 2005) or may be able to maintain current levels of competition by favoring the growth of disturbance-adapted species (Chesson and Huntly 1997). Shifting the intensity and duration of grazing has also been demonstrated to alter species composition, distribution, and productivity (Crawley 1987).

Plants compete for resources both spatially and temporally. The phenology of some species, such as Nevada bluegrass, will allow them to compete more readily early in the growing season while other species have not yet emerged from dormancy. Others, such as smooth brome, have the ability to readily respond to autumn moisture when neighboring species have already entered quiescence. In this same manner, plant species have been observed to respond differently physiologically to

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<sup>14</sup> Meristematic tissue simply refers to groups of cells that are densely packed and able to divide, thus providing the growth and elongation of plant parts (e.g., leaves).

herbivory. Those species that are able to reallocate resources quickly, have developed mechanisms to protect meristematic tissue, or have reduced the overall likelihood of being defoliated will have a competitive advantage over their neighbors. Differences in the response to herbivory not only occur among various plant species, but among various genotypes of the same species as well.

In addition, cattle and other livestock are not indiscriminate in their grazing behaviors. Therefore their presence can influence plant community composition by providing a competitive edge to untargeted plants. The individual plants cattle will likely prefer include those lowest in structural carbohydrates and providing the highest, most available amount of nutrients such as nitrogen for the production of protein via rumen microorganisms.

Leege et al. (1981) addressed the impact of grazing versus rest on mountain meadow sites that had either experienced or were protected from heavy grazing for over 10 years. They observed that redtop, rushes, timothy, dandelion, and clover increased and sedges and aster decreased in grazed moist meadow communities. In wet meadows they discovered that redtop, tufted hairgrass, bulrush, timothy, and clover increased while sedges were more common in protected areas. Jackson and Allen-Diaz (2006) conducted a study on spring-fed wetlands in northern California (which more closely resemble conditions found on Refuge meadows), and found that herbaceous cover and diversity were maintained under light to moderate grazing regimes. Kauffman et al. (1983) discovered that lineleaf Indian lettuce (*Montia linearis*), various willowweeds (*Epilobium* spp.), and sedges were favored while meadow timothy, leafy-bract aster (*Aster foliacens*), and northwest cinquefoil decreased with a 3-year rest from grazing in eastern Oregon. These studies do not necessarily conflict with one another, but point out that species' responses to grazing not only differ between type of use (heavy versus moderate being an extremely coarse description of use) and composition of plant species, but also across individual populations within a species.

Prescriptions are easiest to meet when target vegetation is also the most preferred by livestock (e.g., reed canarygrass during spring green-up). Flexibility and continuous monitoring is required, however, to ensure that non-target vegetation is not impacted enough to compromise specific grazing objectives. This is important because the vegetation most preferred by livestock would likely shift during designated treatment windows.

When considering the use of grazing in a specific area, first-hand knowledge of local cattle behavior and an awareness of studies conducted on comparable sites are very helpful. Most grazing research does not provide enough information to fully understand the overall role that livestock played in study results and how their impact may be replicated or avoided in other situations.

The studies discussed above are helpful in understanding how grazing behavior and competitive interspecific relationships within different plant communities have influenced plant community characteristics over time. They also provide things to look out for or to be particularly cognizant of when creating treatment strategies in similar communities. They do not, however, provide a reliable mechanism for predicting vegetation response across the landscape. Use of the best science available, continuous inventory and monitoring associated with adaptive management, and management flexibility will provide the best results over time as methods and approaches are refined through site-specific experience.

**Responses of Plant Communities to Dormant Season HO/RBG:** Haying may be used in the pursuit of directional change (replacement of one community by another) when conducted within the growing season (e.g., cattail abatement in encroached wet meadows), but such a use is more

appropriately placed alongside growing season treatments as discussed above. The overall concept of haying and RBG treatment is to provide non-directional management<sup>15</sup> on wet meadow habitat. The purpose of this section is to evaluate the scientific literature to determine what impacts haying and RBG may have on plant communities as structural objectives (e.g., for migratory and shorebird habitat) are met.

Traditionally, the haying of native meadows within the Harney Basin begins in early July when plants have reached maturity and before a decline in forage quality takes place. Over the last 20 years, the Refuge adjusted its haying practices by delaying cutting until August 10 because collected data revealed that a much higher mortality rate of nesting and fledged birds takes place before then (Rule et al. 1990). Although a later haying date does decrease the value of forage harvested by cooperating permittees, this practice is consistent with meeting wildlife production objectives across the Refuge's wet meadow areas. Because wildlife depend on specific habitat attributes in order to successfully propagate, it is important to consider vegetative impacts alongside reproductive chronologies.

A review of available research generally supports the practice of delayed mowing as valuable in maintaining meadow diversity.<sup>16</sup> Martin and Chambers (2001, 2002) concluded that biomass was not affected by clippings conducted in late July and that late season herbage removal had few effects on the vegetation because it had already begun to senesce. This is consistent with other studies such as Critchley et al. (2009), who noted that late cutting (associated with senescence) was most likely to aid in the reestablishment of target species-rich communities.

***Discussion of HO versus RBG:*** Both RBG and HO treatments can provide benefits to wildlife. HO can provide a higher level of control by working with permittees to treat only target areas, thus ensuring that non-target plant communities remain unimpacted. RBG targets mowed vegetation that offers nearly twice the level of crude protein for livestock than that which is left standing (Turner 1987),<sup>17</sup> thus ensuring that livestock will focus on treated acres as well. However, it is possible for fall rains to provide green-up that may attract livestock to non-mowed areas within the overall treatment boundary, thus causing unintentional grazing outside of the designated treatment area. Shifts in management from RBG to HO have already taken place across the Refuge in areas where this has commonly occurred to prevent the future occurrence of this.

Even though RBG and HO are both used to meet the same meadow prescriptions, there are several reasons why the Refuge anticipates continuing to use RBG as a habitat management tool. First, the presence of noxious weeds on Refuge meadows is a considerable problem. HO involves the transport of hay and associated weed seeds from the Refuge to private lands. The more HO is used, the greater the spread of weeds such as perennial pepperweed will be across the county and beyond. Because all Refuge meadows host pepperweed and other problem plants at various levels of infestation, current weed control efforts primarily target existing HO fields in order to retard the spread of invasive plants onto other lands. (Priorities are necessary as it would cost over \$1.5 million for initial

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<sup>15</sup> Non-directional management strives to maintain the long-term equilibrium of a site where changes in plant composition is temporary and reversible.

<sup>16</sup> Cited research does not, however, directly address the Refuge's practice of coinciding prolonged irrigation with delayed mowing.

<sup>17</sup> Turner (1987) found that the average crude protein content of rake-bunch versus standing crop was 7.5 percent and 4.3 percent, respectively, over a 3-year period within the Harney Basin. Because pregnant, mature cows require approximately 8 percent crude protein to maintain condition, they will seek available forage that is highest in nutritional value.

treatment of all impacted areas on the Refuge). Herbicides in current use are restricted from use along waterways, which prevents full resolution of the problem. In addition, the soil seed bank would likely require this level of treatment to continue indefinitely. The spread of weeds to private lands is less of a concern when livestock are grazed directly on the Refuge using RBG, because livestock can be quarantined when leaving the Refuge, thus preventing additional expansion of noxious weeds across land management boundaries.

Second, many fields require the mowing of vegetation such as cattail and common reed to prevent or halt the encroachment of emergent marsh vegetation into the wet meadows. Emergent vegetation is generally not palatable to livestock. Nonetheless, HO permittees are required to pay for the tonnage that is hauled off the Refuge, and they are required to bale what is cut in order to achieve litter management objectives for wildlife species the following season. When mowing is conducted in association with RBG, piles are spread out by livestock as they seek nutritious, digestible feed. Any remaining emergent plant litter then becomes disseminated by cattle, which assists in its breakdown prior to the following spring growing season, ultimately promoting the vigor of desirable meadow species.<sup>18</sup>

If piled RBG-treated vegetation remains on the field at the start of the next growing season, it is possible for sandhill cranes and other birds to contract a potentially lethal fungal infection called Aspergillosis. This can occur either under natural conditions or when piled vegetation becomes wet and moldy. Adequate use of vegetation by livestock in RBG-treated meadows has been successful at preventing avian mortality.

#### Effects to Soils

Soils play a critical role in the management of wildlife habitat because they provide the substrate by which plant communities express themselves. Consideration of soil resources is not only important for the production of vegetation, but also to meet water quality and geomorphic objectives as well. Concerns related to soil resources relative to the use of grazing and haying include the potential for increased erosion, compaction, and/or changes in fertility.

Within the Refuge's wet meadows, two soils dominate the areas targeted for haying or RBG. The Skidoosprings series consists of sandy loam within 11 inches of the soil surface, while the Fury series consists of silty-clay loam within the top 10 inches. More attention is merited for the Fury series because of its finer texture class. Typical of mollisols, however, this soil type is high in organic matter content and also hosts plant species that are high in root length density (RLD) (see discussion below) and biomass. Finer textured soils such as this across the Refuge where haying or grazing treatments are occurring will be prioritized in annual monitoring efforts.

**Erosion:** The Refuge's wet meadows are located on relatively flat topography within the Blitzen and Double-O valleys and are able to rapidly dissipate the energy of potentially destructive flood waters. Because they do not host stream channels and are not found on slopes, erosion caused by water is not a large concern. Impacts caused by wind erosion are also negated by the extensive fibrous root systems of vegetation found just below the surface of the soil within this habitat type. The potential for soil erosion is greatest along dikes, but most of these areas fall outside designated rake-bunch

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<sup>18</sup> A third reason that may be argued is the impact repeated use of HO may have on meadow systems via nutrient mining. How long can a site remain productive if nutrients aren't returned to the system from which they came? There is no research to back up this hypothesis, however, although soil testing may be conducted comparing HO and RBG fields to determine if this concern is merited.

areas and the exclusion of cattle from all canal systems is expected to be completed in the next few years.

Livestock management and associated inventory and monitoring activities will seek to prevent the creation of bare soil in wet meadows by not impacting isolated areas to the point where vegetation is removed and large areas of bare soil are exposed (e.g., regular movement of mineral tubs, adequate graveling of the immediate area of stock tanks, routing tank overflows to nearby emergent stands).

**Compaction:** The dominant concern regarding the relationship between soils and haying/grazing treatments is compaction. The way soils respond to the presence of machinery or livestock depends on the following prevailing factors: soil texture, on-site soil conditions (wet versus dry, frozen versus thawed), and plant community type (e.g., sedges versus bunchgrasses).

**Influence of Soil Texture:** Fine-textured soils (clay, clay-loam, etc.) have high plasticity and cohesion properties. When they are disturbed under moist conditions, their aggregates are easily broken down. When this occurs, macropores within the soil profile can be greatly diminished. If the impact (i.e., compaction) is extensive enough the soil can become puddled.<sup>19</sup> Because of this, issues regarding compaction and infiltration cannot be separated. Fortunately, there are mitigating factors that influence whether and to what extent such “restructuring” takes place under moist conditions. Soils high in organic matter in the O and A horizons are much more stable than those that are not.

Soil organic matter can consist either of detritus/humus or living vegetative root masses. In riparian studies, RLD has been found to greatly influence site stability. RLDs were found to be especially high in communities dominated by Nebraska sedge, Douglas sedge, and Baltic rush (Manning et al. 1989). Although Manning et al. (1989) associated RLD with the control of erosion in riparian systems, a link can be made between community type and likely compaction issues within wet meadows. Warren et al. (1986) observed that degree of compaction was at least partially influenced by relative sparseness of vegetation in upland sites.

Research conducted on moderately fine soils (silt loam/loam) subjected to season-long and deferred (rotating early/late summer use) grazing treatments found that bulk density (a measure of compaction) was significantly lower and infiltration rates were consistently higher in exclosed plots within both dry and wet meadow sites (Kauffman et al. 2004). Results from a Kentucky bluegrass community study stated that the amount of compaction varied according to soil texture and only impacted the upper 4 inches of the profile. Sites highest in silt and clay had significantly reduced pore space and higher bulk density on grazed areas (treated annually June 1 through October 31) than within exclosures. Where soil texture was more coarse (slightly less clay and more sand), only the first 2 inches displayed these properties (Orr 1960).

Comparable observations were made by other studies examining the relationship of treatment duration/timing and various soils along a texture gradient. The conclusion of a study conducted on fine-textured soil hosting newly seeded alfalfa (*Medicago sativa*) and bromegrass (*Bromus biebersteinii*) revealed that increases in cattle stocking rates during the winter significantly increased soil bulk density (Stephensen and Veigel 1987). Plots within a blue grama (*Bouteloua gracilis*) and buffalograss (*Buchloe dactyloides*) site consisting of rough-textured soil revealed no significant differences between treatments,<sup>20</sup> while bulk density significantly increased in fine-textured soils

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<sup>19</sup> Puddling is a term used to express a state of relative impermeability of the soil to air and water.

<sup>20</sup> The grazing treatment took place from May 1 to October 31 for a period of 30 years.

(Van Haveren 1983). No compaction was found to occur on gravelly/sandy loam soils in a riparian area in northeastern Oregon (Bohn and Buckhouse 1985).

Of particular interest is a study conducted by Wheeler et al. (2002) in a plant community that consisted primarily of Kentucky bluegrass, water sedge, beaked sedge, tufted hairgrass, and dandelion, similar in nature to the hydrologically driven plant community gradient found within the Refuge's wet meadows. The study found that although bulk density increased at a depth of 5 to 15 cm (2-6 inches) in grazed treatments occurring in early spring and late summer, the highly organic surface area (0-5 cm [0-2 inches]) did not experience compaction. Of additional interest in this study was the discovery that the bulk density and infiltration rate impacts observed at lower soil depth recovered within 1 year after grazing ceased, which was mainly attributed to frequent freeze-thaw events and high soil organic matter. Similarly, Stephensen and Veigel (1987) observed that recovery of impacted soils on their plots was nearing completion after two growing seasons following their full range of stocking intensities.

#### Effects to Surface and Groundwater Resources

Under Preferred Alternative 2 of the CCP, cattle grazing would not be permitted in riparian or riverine habitats without site-specific management prescriptions created with input provided by the Ecology Work Group. Such prescriptions would clearly state the rationale for livestock use as well as timing, stocking rate, and other thresholds used in meeting specific plant community attributes. A minimum buffer of 20 meters (65 feet) would protect river and creek channels from haying and grazing treatments. Water delivery canals would not fall under this buffer requirement with the exception of East Canal, which is managed as a fishery for redband trout.

**Surface Water:** A study assessing the water quality impacts associated with Refuge water and habitat management (irrigation of hay and rake-bunch meadows, grazing, surface and subsurface return from wetlands and agricultural fields) was conducted in the mid-2000s (Mayer et al. 2007). The study investigated a variety of water quality parameters, including water temperature, conductivity, pH, dissolved oxygen, turbidity, nutrients, *E. coli*, and total coliform between April and September. Grazing has the potential to influence bacteria and nutrients in surface water.

**Bacteria:** *E. coli* and total coliform samples were collected at numerous stations from Page Springs (southern boundary of the Refuge) to below Sodhouse Dam (near Malheur Lake). The state standard for *E. coli* is that the geometric mean of five samples collected over a 1-month period cannot exceed 126 organisms per 100 mL and no single sample can exceed 406 organisms per 100 mL.

Samples from Station 1 (Blitzen River below Page Springs Dam) were very low (geometric mean of 1 organism/100 mL). Numbers increased slightly downstream at Station 10 (Blitzen River near Grain Camp Dam) and Station 12 (Blitzen River below Sodhouse Dam), but they were still quite low (geometric means of 10 organisms/100 mL or less). The highest numbers of *E. coli* were found at the confluence of McCoy Creek and the Blitzen River, but the numbers were still well below the standard (<50 organisms/100 mL).

**Nutrients:** The study also examined nutrient loading for irrigated wet meadow areas. Based on the Westside P Ranch area examined in the study, the authors concluded that return flows from seasonally flooded wet meadow habitat contribute to phosphorus concentrations in the river, and possibly to nitrogen. However, the study authors did not identify cattle to be the source of this

nutrient loading. It could be the wetting/drying cycle and/or the prevalence of thousands of defecating waterbirds and waterfowl associated with these wetlands.

**Groundwater:** Stock tanks are used to supply livestock with water sufficient to meet their needs while on the Refuge. Water for the stock tanks comes from wells. Because stock tanks use a minimal amount of water drawn from wells with 2 hp pumps, groundwater levels would not be likely to be significantly impacted.

#### Other Effects

**Loss of Habitat from Facility Construction:** Under Preferred Alternative 2, no new facilities will be constructed for haying and grazing activities.

**Impacts to Priority Public Uses:** Haying and grazing operations may occasionally conflict with the experiences of some Refuge visitors. However, such impact would be expected to be moderate to minor at the Refuge due to the seasonal differences in uses. Refuge visitation peaks during spring, when little grazing or haying will likely occur. Growing season mowing and grazing will not occur at a scale that would disrupt or significantly impact wildlife viewing opportunities enjoyed by Refuge visitors. During the fall when haying and RBG operations are active, wildlife observation and photography visitation falls off. Hunting use increases during this season but is concentrated in the Buena Vista Unit and around Malheur Lake, where little or no haying or grazing occurs.

**Impacts from Horses and ATVs:** Livestock trailing will continue to occur on the Refuge. ATVs and horses are permissible for use in trailing activities and ATVs may be used in providing supplement tubs in RBG areas. The impacts of horses are considered in the Wildlife Observation, Photography, and Interpretation Compatibility Determination.

Negative impacts will be avoided or minimized by considering specific routes, timing, and other factors on a case-by-case basis.

**Infrastructure:** Regular, semiannual road maintenance activities cover the minimal disturbance that livestock trailing and equipment/hay hauling activities may cause. Livestock activities have not harmed, nor are they predicted to harm, public use trails on the Refuge.

Use of Diamond and Nine Mile corrals impacts less than 2 acres of Refuge land. Therefore, impacts from this use are negligible.

#### **Public Review and Comment**

Various opportunities were provided for the public to engage in the CCP planning process. Appendix J details public involvement undertaken during the development of the CCP/EIS. Written comments on this draft CD are welcome.

#### **Determination**

<u>          </u>	Use is Not Compatible
<u>  X  </u>	Use is Compatible with the Following Stipulations

## **Stipulations Necessary to Ensure Compatibility**

### ***General***

- Use shall be administered as described in the Description of Use above.
- Neighboring habitat boundaries and large mosaics of upland areas (e.g., dry meadow, sagebrush lowland) found within wet meadow treatments will either be excluded by means of fencing or monitored annually to ensure that these areas are not negatively impacted by grazing treatments. Parameters for monitoring will include desirable attributes associated with pertinent habitat types.
- Class 1 ATVs with Oregon permits would be allowed at Malheur Refuge in association with grazing and haying. Class 1 includes ATVs and three-wheelers, are vehicles 50 inches wide or less, have a dry weight of 800 pounds or less, have a saddle or seat, and travel on three or four tires (OPRD 2011). ATVs may only be used in trailing livestock along designated routes to prescribed treatment areas and when necessary to maintain herd health (e.g., feed supplementation) and maintain fence lines (e.g., stringing wire). ATV use is restricted to the fields subject to the use or the designated routes for trailing. ATVs must be weed-free upon entering the Refuge.

### ***Grazing***

- Permittee has the responsibility to ensure that all fences are intact and gates closed before turning out livestock.

### ***Haying***

- All haying operations must be conducted from dawn to dusk only.
- Hay cannot be fed out on the Refuge unless authorized by the Refuge Manager for the purpose of weed prevention. Quarantines will last no longer than 5 days.

### **Justification**

The haying and grazing cooperative land management program contributes to achieving Refuge purposes and goals as identified in the CCP/EIS and the Refuge System mission by providing valuable foraging, resting, pairing, nesting, and brood-rearing areas and conditions for the sandhill crane, bobolink, cinnamon teal, and other meadow-dependent species. It also contributes by economically providing weed control and other habitat maintenance functions that are not feasible for limited Refuge staff to accomplish. Grazing and haying are desirable means of maintaining this type of habitat because its area is too large for annual prescribed burning and repeated mowing of the meadows is beyond the capability of the Refuge staff.

Although allowing haying and cattle grazing on the Refuge can result in disturbance to wildlife, disturbance will be intermittent and short term. There are more than adequate amounts of undisturbed habitat available to wildlife for escape and cover. The relatively limited number of individuals expected to be adversely affected will not cause wildlife populations to materially decline, the physiological condition and production of species will not be impaired, their behavior and normal activity patterns will not be altered dramatically, and their overall welfare will not be negatively impacted. The goal of both dormant and growing season treatments is to improve habitat for cranes and other wetland birds and the short-term tradeoffs are good investments for the birds. Thus

allowing haying and cattle grazing on the Refuge is found to be in support of and compatible with the purposes for establishment of the Refuge and the mission of the Refuge System.

### **Mandatory Reevaluation Date**

09/2022 Mandatory 10-year Reevaluation Date (for all uses other than priority public uses)

### **NEPA Compliance for Refuge Use Decision**

X Environmental Impact Statement and Record of Decision

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**Signatures:**

Prepared by: \_\_\_\_\_  
(Signature) (Date)

Refuge Manager/  
Project Leader  
Approval: \_\_\_\_\_  
(Signature) (Date)

**Concurrence:**

Refuge Supervisor: \_\_\_\_\_  
(Signature) (Date)

Regional Chief,  
National Wildlife  
Refuge System: \_\_\_\_\_  
(Signature) (Date)

## **B.8 Plant Gathering of Culturally Important Plants Compatibility Determination**

**RMIS Database Use:** Plant Gathering

**Refuge Name:** Malheur National Wildlife Refuge

**City/County and State:** Princeton, Harney County, Oregon

### **Establishing and Acquisition Authorities and Refuge Purposes:**

- “ ... a Refuge and breeding ground for migratory birds and other wild life ... ” Executive Order 7106, dated July 19, 1935, as modified by Public Land Order 1511, dated September 24, 1957
- “ ... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act)
- “ ... for the development, advancement, management, conservation, and protection of fish and wildlife resources ... ” 16 U.S.C. 742f(a)(4)
- “ ... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ... ” 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)
- “ ... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans ... ” 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

### **National Wildlife Refuge System Mission**

The mission of 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” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

### **Description of Use**

Malheur Refuge is the ancestral home of the Burns Paiute Tribe. Culturally important plants that grow in the wetlands, marshes, and riparian areas have been collected by members of the Tribe for generations. Culturally important plant collection involves taking hand cuttings from live plants (e.g., willow whips) or plants that have reached senescence (cattails and bulrush). Plant materials are collected in small amounts and plant mortality does not occur as a result of these activities. Collection typically occurs in areas closed to all public access.

Culturally important plants collected on the Refuge are used by Tribal members in a non-commercial way to obtain materials used to perpetuate traditional weaving techniques, and as an educational opportunity used to introduce Tribal youth to an important aspect of their heritage. Tribal elders have been involved in the development of a native plant list that is consulted by Refuge staff when habitat restoration projects are being planned on the Refuge.

The occurrence of this activity is infrequent and is not expected to grow significantly in the near future. Tribal members prefer to collect plant materials on the Refuge because of their abundance, ease of access, and the absence of herbicide use. Selection of collection areas occurs in coordination with Refuge staff and typically occurs where access for elders is easy, where plants are abundant, where collection has occurred in the past and plants have responded positively (e.g., willow growth is enhanced by cutting), and where conflicts with wildlife would be minimal or absent. Collection typically occurs from late summer through the winter when plants are dormant and when fields and ponds are dry.

The opportunity for Tribal members to collect culturally important plants on the Refuge has resulted in the development of a positive and collaborative relationship between the Burns Paiute Tribe and Malheur Refuge. Continuation of this culturally important opportunity will ensure that the relationship continues and matures in the future.

*Plant Materials:* Plants typically collected include cattails (*Typha* spp.), bulrush (*Scirpus* spp.), sedges (*Carex* spp.), redosier dogwood (*Cornus sericea*), various willows (*Salix* spp.), milkweed (*Asclepias* spp.), and seepweed (*Suaeda* spp.).

### **Availability of Resources**

Adequate Refuge personnel and base operational funds are available to manage this activity at existing and projected levels. Staff time (less than 1 day per year) primarily involves phone conversations, email correspondence, and preparation of SUPs.

### **Anticipated Impacts of the Use**

Non-commercial collection of culturally important plants at current levels is not expected to incur more than negligible short-term or long-term impacts to natural resources. These would involve localized and temporary vegetation trampling and localized and temporary wildlife disturbance. Sites would be monitored by Refuge staff to ensure that plant gathering does not result in depletion of the harvested resource. Under these conditions, no long-term impacts would be expected.

*Impacts to Listed Species:* There are no listed or endangered species on the Refuge. Greater sage-grouse (*Centrocercus urophasianus*) and the Great Basin Columbia spotted frog (*Rana luteiventris*) are designated as Federal candidate species for listing under the Endangered Species Act. Incidental post-breeding observations of sage-grouse have been made in recent years in the southeast portion of the Blitzen Valley. Spotted frogs have been documented in limited areas on the Refuge (Engle 2001; Pearl et al. 2010; Rombough and Engler 2010; ODFW 2011). But it is unclear at this time if the Refuge population is part of the Great Basin distinct population, which is the Federal candidate species, or if they belong to the Oregon population.

Although the Refuge has occurrences of these candidate species, it is anticipated that impacts from plant collecting would be negligible and would not be expected to increase disturbance to candidate species any more than non-commercial uses. Persons engaging in plant collecting would be required to apply for an SUP, and stipulations for reducing impacts to candidate species would be further covered by the permit. If uses result in unacceptable adverse effects to candidate species or habitats, the Refuge would impose restrictions to mitigate disturbance.

**Impacts to Other Priority Public Uses:** Persons collecting plants may occasionally flush wildlife from areas used by hunters, wildlife observers, photographers, anglers, or EE groups, but this conflict would be expected to be minimal.

### **Public Review and Comment**

Various opportunities were provided for the public to engage in the CCP planning process. Appendix J details public involvement undertaken during the development of the CCP/EIS. Written comments on this draft CD are welcome.

### **Determination**

Use is Not Compatible  
 Use is Compatible with the Following Stipulations

### **Stipulations Necessary to Ensure Compatibility**

- An SUP will be issued for the collection of culturally important plants by Burns Paiute Tribe members. The SUP will indicate the plant collection locations, dates of access, and quantity of materials that may be harvested.
- Collection sites shall be monitored by Refuge staff to ensure that plant gathering does not result in depletion of the harvested resource.

### **Justification**

Although collection of plants can result in vegetation modification and disturbance to wildlife, this activity would occur on a small percentage of Refuge acres. There is sufficient undisturbed habitat available to Refuge wildlife for escape and cover, and wildlife populations will find sufficient food resources and resting places. The relatively limited number of individual plants and animals expected to be adversely affected will not cause wildlife populations to materially decline, the physiological condition and production of Refuge species will not be impaired, their behavior and normal activity patterns will not be altered dramatically, and their overall welfare will not be negatively impacted. Thus, allowing this use to occur under the stipulations described above will not materially detract or interfere with the purposes for which the Refuge was established or the Refuge System's mission.

Issuance of an SUP eliminates the potential for overcollection of culturally important plants, guarantees that collectors have authorization to be in areas closed to public access, and ensures that Refuge staff are aware of collection activities.

### **Mandatory Reevaluation Date**

09/2022 Mandatory 10-year Reevaluation Date (for all uses other than priority public uses)

### **NEPA Compliance for Refuge Use Decision**

Environmental Impact Statement and Record of Decision

## References

- Engle, J.C. 2001. Population biology and natural history of Columbia spotted frogs (*Rana luteiventris*) in the Owyhee Uplands of southwest Idaho: implications for monitoring and management. M.S. thesis. Boise State University, Boise, ID. 66 pages. Available at: <http://www.fws.gov/oregonfwo/Species/Data/ColumbiaSpottedFrog/>.
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- Rombough, C. and J. Engler. 2010. Surveys for Columbia spotted frog (*Rana luteiventris*) at ARRA project sites, Malheur NWR. Report to USFWS from Rombough Biological. Princeton, OR. 13 pp.

**Signatures:**

Prepared by: \_\_\_\_\_  
(Signature) (Date)

Refuge Manager/  
Project Leader  
Approval: \_\_\_\_\_  
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**Concurrence:**

Refuge Supervisor: \_\_\_\_\_  
(Signature) (Date)

Regional Chief,  
National Wildlife  
Refuge System: \_\_\_\_\_  
(Signature) (Date)

## **B.9 Research, Scientific Collecting, and Surveys Compatibility Determination**

**RMIS Database Use:** Research; Scientific Collecting; Surveys

**Refuge Name:** Malheur National Wildlife Refuge

**City/County and State:** Princeton/Harney, Oregon

### **Establishing and Acquisition Authorities and Refuge Purposes**

- “ ... a Refuge and breeding ground for migratory birds and other wild life ... ” Executive Order 7106, dated July 19, 1935, as modified by Public Land Order 1511, dated September 24, 1957
- “ ... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act)
- “ ... for the development, advancement, management, conservation, and protection of fish and wildlife resources ... ” 16 U.S.C. 742f(a)(4)
- “... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ... ” 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)
- “ ... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans ... ” 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

### **National Wildlife Refuge System Mission**

The mission of the National Wildlife Refuge System is “to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended [16 USC 668dd-668ee]).

### **Description of Use**

**Program:** The Refuge allows research on a variety of biological, physical, archeological, and social issues and concerns to address Refuge management information needs or other issues not related to Refuge management. This CD refers to research, collecting, or surveys conducted by non-USFWS entities. This may include other Federal, state, tribal, and private entities, or their contractors.

**Location of Use:** Research, scientific collecting, and surveys may occur at any location on the Refuge. Location would depend on the research objectives.

The Refuge has numerous archaeological and paleontological sites. All research conducted on the Refuge must take this into consideration. All laws and Refuge policy associated with artifacts must be followed when gaining access to closed sites on the Refuge for research.

***Associated Facilities and Access:*** Although no facilities at the Refuge will be maintained expressly for this use, the use may involve temporary use of some facilities. Research study sites, sampling locations, and transects shall be temporarily marked by highly visible wooden or metal posts, and/or flagging that must be removed when research ceases.

Access to study sites shall be by foot, truck, all-terrain vehicle, boat, airboat, canoe, other approved watercraft, and aircraft. Vehicle use is allowed on Refuge roads normally open to the public. Researchers may not enter closed areas, unless specifically authorized access in the SUP.

***Administration of the Use:*** The use would be conducted on an as-needed basis, subject to SUP approval. Prior to initiating the project, research applicants must submit a proposal outlining: 1) objectives of the study; 2) justification for the study; 3) detailed methodology and schedule; 4) potential impacts on Refuge wildlife and/or habitat, including disturbance (short and long term), injury, or mortality; 5) potential impacts to wilderness natural areas; 6) personnel required; 7) costs to Refuge, if any; and 8) end products (i.e., reports, publications).

Proposals would be reviewed by Refuge staff, the Regional Office Branch of Refuge Biology, and others as appropriate. Evaluation criteria will include, but not be limited to, the following: 1) research that will contribute to management will have higher priority than other requests; 2) research that will conflict with higher priority research, monitoring, or management programs may not be granted; 3) research projects that can be reasonably conducted off-Refuge are less likely to be approved; 4) research that causes undue disturbance or is intrusive will likely not be granted. Level and type of disturbance will be carefully weighed when evaluating a request. All requests will be carefully considered because some species are very sensitive to disturbance; 5) research evaluation will determine if any effort has been made to minimize disturbance through study design, including considering adjusting location, timing, scope, number of permittees, study methods, number of study sites, etc.; 6) if staffing or logistics make it impossible for the Refuge to monitor researcher activity in a sensitive area, this may be reason to deny the request; 7) the length of the project will be considered and agreed upon before approval. Projects will not be open-ended and will be reviewed annually at a minimum.

If no conflicts to the Refuge's mission are determined and an SUP is written, then the study will be conducted. At any time if the research is in violation of the terms and agreement of the SUP, the Refuge can terminate access.

***Number of Projects and Seasonal Patterns:*** The number of projects is expected to vary but based upon current experience, may range from 2 to 12 projects per year. Chapter 4 in the CCP describes the kinds of research projects that have occurred in the past.

The season of use may be at any time of the year. This use would only be permitted when conflicts did not occur with natural resources. This will be detailed in the permit's Special Conditions section. For example, Malheur Lake access with an airboat will not be granted to researchers if a disruption of breeding and nesting birds occurs.

### **Availability of Resources**

***Resources Involved in the Administration and Management of Use:*** Time will be required by office staff to prepare and issue SUPs. Designated research areas will need to be monitored by staff within

the Biology, Visitor Services, or Archaeological programs and Refuge law enforcement to ensure permit conditions are met.

***Special Equipment, Facilities, or Improvements Necessary to Support the Use:*** The demand for Refuge equipment and facilities would be considered on a case-by-case basis depending on research study objectives. Arrangements would have to be made between the Refuge and researchers to determine if support is needed. If so, the researcher would have to provide grant money to cover costs or the Refuge would donate in-kind to the project.

***Maintenance Costs:*** Maintenance costs would be considered on a case-by-case basis depending on the research study objectives. The specific use would have to provide grant money to cover costs or the Refuge would donate in-kind to the project.

***Monitoring Costs:*** No monitoring costs will occur. The researchers will be responsible for monitoring.

***Offsetting Revenues:*** Because this usage aids the Refuge in understanding specific objectives and projects in addition to staff activities, research results provide the potential for overall cost savings for Refuge management activities. Since research represents a cost saving to the Refuge, there will be no fee for the issuance of permits.

#### **Anticipated Impact of the Use(s)**

Given the stipulations listed below, some short-term impacts can be expected, but no long-term or cumulative effects are anticipated because of the specifications in the SUP.

***Short-term Impacts:*** Research activities may disturb fish and wildlife and their aquatic and terrestrial habitats in the short term. For example, the presence of researchers can cause waterfowl to flush from resting and feeding areas, or cause disruption of birds in nests or breeding territories. Efforts to capture animals can cause disturbance or injury. To wildlife, the energy cost of disturbance may be appreciable in terms of disruption of feeding, displacement from preferred habitat, and the added energy expended to avoid disturbance.

Sampling activities can cause compaction of soils and the trampling of vegetation, the establishment of temporary foot trails and boat trails through vegetation beds, disruption of aquatic sediments, and minor tree damage when tree climbers access bird nests. This may lead to avenues of predation and predator habituation. The removal of vegetation or sediments by core sampling methods can cause increased localized turbidity and disrupt non-target plants and animals. Installation of posts, equipment platforms, collection devices and other research equipment in open water may present a hazard to boaters if said items are not adequately marked and/or removed at appropriate times or upon completion of the project. Research efforts may also discover methods that result in a reduction in impacts described above.

Adverse impacts of research will be minimized through stipulations described below. Vehicular access would be allowed only on roads and mowed dike tops, thus resulting in no net increase in vehicular impact. Access into any closed areas would only be permitted under terms specifically described in the SUP, thus avoiding and minimizing human disturbance to feeding and resting waterfowl. Researchers would also be required to observe public use regulations to avoid disturbance of fish and wildlife and provide areas of quiet and solitude sought by many users of the Refuge. Any

research equipment that remains in the field for the duration of the project will be clearly marked to avoid potential hazards presented to other Refuge users.

**Long-term Impacts:** The long-term impacts of research may include injury or death to groups of wildlife or to individuals during efforts to capture samples. Continual disruption could cause expenditure of energy, decreased immunity to pathogens, nest abandonment, displacement in less than optimal habitat, and nest swamping from wave action. However, given the stipulations listed below, no or very minimal impacts will be expected in the long term. Research efforts may also discover methods that result in a reduction in impacts described above.

**Cumulative and Indirect/Secondary Impacts:** Because continuous, long-term research will rarely be allowed at one site, long-term cumulative impacts such as poor water quality, benthic disturbances, wildlife disturbance, and/or vegetation trampling would be negligible. SUP conditions will include special conditions to ensure that impacts to wildlife and habitats are kept to a minimum and are short term.

**Impacts to Listed Species:** There are no listed or endangered species on the Refuge. Greater sage-grouse (*Centrocercus urophasianus*) and the Great Basin Columbia spotted frog (*Rana luteiventris*) are designated as Federal candidate species for listing under the Endangered Species Act. Incidental post-breeding observations of sage-grouse have been made in recent years in the southeast portion of the Blitzen Valley. Spotted frogs have been documented in limited areas on the Refuge (Engle 2001; Pearl et al. 2010; Rombough and Engler 2010; ODFW 2011). But it is unclear at this time if the Refuge population is part of the Great Basin distinct population, which is the Federal candidate species, or if they belong to the Oregon population.

Although the Refuge has occurrences of these candidate species, it is anticipated that impacts from research would be negligible and would not be expected to increase disturbance to candidate species any more than non-commercial uses. Persons engaging in research would be required to apply for an SUP, and stipulations for reducing impacts to candidate species would be further covered by the permit. If uses result in unacceptable adverse effects to candidate species or habitats, the Refuge would impose restrictions to mitigate disturbance.

**Impacts to Priority Public Uses:** Researchers may occasionally flush wildlife from areas used by hunters, wildlife observers, photographers, anglers, or EE groups, but this conflict would be expected to be minimal.

### Public Review and Comment

Various opportunities were provided for the public to engage in the CCP planning process. Appendix J details public involvement undertaken during the development of the CCP/EIS. Written comments on this draft CD are welcome.

### Determination

<u>          </u>	Use is Not Compatible
<u>  X  </u>	Use is Compatible with the Following Stipulations

### **Stipulations Necessary to Ensure Compatibility**

This activity would only be allowed in designated areas and specific terms would be established in associated SUPs regarding designated research areas, permissible dates, conditions of research, off-road use of vehicles, and acceptable research procedures. Permit conditions are likely to change from project to project depending on study objectives. These conditions may include, but are not limited to, the following:

- If the proposed research methods would impact or potentially impact Refuge resources (habitat or wildlife), it must be demonstrated that the research is essential (i.e., critical to survival of a species; critical habitat for a species; or assessment and/or restoration after cataclysmic events) and the researcher must identify the issues in advance of the impact. Highly intrusive or manipulative research is generally not permitted in order to protect our natural resource.
- Prior to conducting investigations, researchers will submit a written study proposal with their request to obtain an SUP from the Refuge that makes specific stipulations related to when, where, and how the research will be conducted (see Description Of Use section). Managers retain the option to prohibit research on the Refuge that does not contribute to the purposes of the Refuge or the mission of the Refuge System, or that causes undue resource disturbance or harm.
- Approved research projects will be conducted under a Refuge-issued SUP, which will have additional project-specific stipulations.
- Researchers must possess all applicable state and Federal permits for the capture and possession of protected species for conducting regulated activities in wetlands and for other regulated activities.
- Research must adhere to current species protocols for data collection.
- Researchers must clearly mark posts, equipment platforms, fencing material, and other equipment left unattended in open water so as to not pose a navigation hazard to boaters. Such items shall be removed from the river as soon as practicable upon completion of the research.
- SUPs will be valid for 1 year only. Renewals will be subject to the Refuge Manager's review of research data, status reports, compliance with the CD and permit stipulations, and permits.
- Off-road access is only allowed when soils are frozen or dry in areas where native vegetation will not be impacted, within specific boundaries.
- Research must be during hours when appropriate staff are available to monitor conduct and permit compliance.
- Inspection and washing of research equipment to decrease the spread of invasive species is required.
- Activities are allowed only where minimal impacts to wildlife may occur.
- Periodic evaluation of research projects will be held to assess if objectives are being met and ensure that resources are not being degraded.
- Regulations to ensure the safety of all participants must be followed.
- Law enforcement patrols are conducted to ensure compliance with state and Refuge regulations.
- The Refuge Manager can suspend/modify conditions/terminate on-Refuge research that is already permitted and in progress, should unacceptable impacts or issues arise or be noted.

## Justification

Research by third parties plays an integral role in Refuge management by providing information needed to manage the Refuge on a sound scientific basis. Investigations into the biological, physical, archeological, and social components of the Refuge provide a means to analyze management actions, impacts from internal and outside forces, and ongoing natural processes on the Refuge environment. Research provides scientific evidence as to whether the Refuge is functioning as intended when established by Congress.

Although these activities can result in disturbance to wildlife, these activities would occur on a small percentage of Refuge acres. There is sufficient undisturbed habitat available to Refuge wildlife for escape and cover, and wildlife populations will find sufficient food resources and resting places. The relatively limited number of individual plants and animals expected to be adversely affected will not cause wildlife populations to materially decline, the physiological condition and production of Refuge species will not be impaired, their behavior and normal activity patterns will not be altered dramatically, and their overall welfare will not be negatively impacted. Thus, allowing research, scientific collecting, and survey activities to occur under the stipulations described above will not materially detract or interfere with the purposes for which the Refuge was established or the Refuge System's mission.

## Mandatory Reevaluation Date

09/2022 Mandatory 10-year Reevaluation Date (for all uses other than priority public uses)

## NEPA Compliance for Refuge Use Decision

X Environmental Impact Statement and Record of Decision

## References

- Engle, J.C. 2001. Population biology and natural history of Columbia spotted frogs (*Rana luteiventris*) in the Owyhee Uplands of southwest Idaho: implications for monitoring and management. M.S. thesis. Boise State University, Boise, ID. 66 pages. Available at: <http://www.fws.gov/oregonfwo/Species/Data/ColumbiaSpottedFrog/>.
- ODFW. 2011. Greater sage-grouse backgrounder. Available at: [http://www.dfw.state.or.us/wildlife/sagegrouse/docs/Greater\\_Sage\\_Grouse\\_Candidate\\_species\\_Backgrounder.pdf](http://www.dfw.state.or.us/wildlife/sagegrouse/docs/Greater_Sage_Grouse_Candidate_species_Backgrounder.pdf) [sic].
- Pearl, C.A., S.K. Galvan, M.J. Adams, and B. McCreary. 2010. Columbia spotted frog (*Rana luteiventris*) in southeastern Oregon: A survey of historical localities, 2009. U.S. Geological Survey Open File Report 2010-1235. 96 pp.
- Rombough, C. and J. Engler. 2010. Surveys for Columbia spotted frog (*Rana luteiventris*) at ARRA project sites, Malheur NWR. Report to USFWS from Rombough Biological. Princeton, OR. 13 pp.

**Signatures:**

Prepared by: \_\_\_\_\_  
(Signature) (Date)

Refuge Manager/  
Project Leader  
Approval: \_\_\_\_\_  
(Signature) (Date)

**Concurrence:**

Refuge Supervisor: \_\_\_\_\_  
(Signature) (Date)

Regional Chief,  
National Wildlife  
Refuge System: \_\_\_\_\_  
(Signature) (Date)

## B.10 Farming Compatibility Determination

**RMIS Database Use:** Farming

**Refuge Name:** Malheur National Wildlife Refuge

**City/County and State:** Princeton/Harney, Oregon

### Establishing and Acquisition Authorities and Refuge Purposes

- “... a Refuge and breeding ground for migratory birds and other wild life ...” Executive Order 7106, dated July 19, 1935, as modified by Public Land Order 1511, dated September 24, 1957
- “... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act)
- “... for the development, advancement, management, conservation, and protection of fish and wildlife resources ...” 16 U.S.C. 742f(a)(4)
- “... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)
- “... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans ...” 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

### National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System is “to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended [16 USC 668dd-668ee]).

### Description of Use(s)

**Acres and Crops Grown:** The cooperative program would include between 80 to 1,000 acres to support objectives described in the CCP using appropriate farming practices. Crops would include wheat, barley, rye, oats, or similar crops known to have wildlife forage value. Crops would generally be grown under non-irrigated or sub-irrigated conditions; however, in some years spring runoff and rainfall during the growing season are insufficient to produce a successful crop.

**Location of Use:** The use would take place in areas deemed advantageous to target wildlife species per the goals and objectives listed in various Refuge plans. Initially, the farming program would focus on areas in the vicinity of Center Patrol Road near Refuge Headquarters north of Rattlesnake Butte.

**Timing of Use:** Depending on the target crop, seed bed preparation and seeding would take place in late winter/early spring with associated soil amendments and herbicide being applied in spring and summer, respectively. Mowing would occur in the summer or early fall, depending on the crop.

Harvesting of the crop would occur as soon as the crop has matured and ripened and before the fall hunting season.

**Equipment, Facilities and Improvements:** To support this use, standard crop farming equipment will be used such as tractors, plows, disks, seeders, trucks, wagons, spray rigs, and combines. The cooperators will not use any on-Refuge facilities for seed or harvested grain storage. Minimal access road improvements and maintenance will be needed for farming equipment ingress/egress.

**Administration of the Use:** Cropland management would be carried out by private parties on Refuge lands under the terms of cooperative agreement. The agreement could take the form of either a Cooperative Farming Agreement (CFA) or a Cooperative Land Management Agreement (CLMA). Under either scenario, the farmer would receive an 80 percent share of the crop and the remaining 20 percent is left in the field for wildlife. Under this scenario, approximately 950 acres of grain would be needed. The two types of cooperative agreements are described below:

- **CFA:** Within such agreements, the cooperators would provide labor, equipment, and materials and the government would provide the land base unless other arrangements are made between the Refuge Manager and cooperators(s). The resulting crop would be shared by the cooperators and the government.
- **CLMA:** The CLMA is an in-kind program, which means that both parties receive benefits from the land. In this case, the cooperators and Refuge both receive a portion of the crop, and the Service receives management actions that enhance habitat condition through activities such as weed control and prevention strategies incorporated into the program.

The CLMA would be an annual agreement composed of: 1) objectives of the program; 2) commitment and responsibilities of each partner under the contract; 3) description and map of the area affected by the agreement; 4) details on the techniques, schedules, strategies, and methods to be used in the cooperative agreement; 5) crop or other products produced under the agreement; and 6) delineation of shares. The CLMA would be reviewed and updated annually. The CLMA would not express or describe any permanent or long-term agreement between the cooperators and the Refuge.

The cooperators (farmers) would be selected based on his or her ability to: 1) adapt and meet the changing conditions of the program; 2) apply best land management practices to selected land tracts; 3) use best management practices of an integrated pest management (IPM) plan; 4) meet the special conditions outlined in the CLMA; 5) sustain an operation under potential impacts of wildlife depredation and changing habitat conditions; and 6) be economically capable of operating under the conditions of the program.

**Rationale for the Use:** The purpose of developing a cooperative farming program is to manage high-carbohydrate autumn foraging habitat for sandhill cranes, waterfowl, and other migratory and resident wildlife species. The Refuge (together with cereal grains then grown on the Refuge) was identified as one of four autumn staging and migration stopover sites in the Greater Sandhill Crane (Central Valley Population) Pacific Flyway Plan (Pacific Flyway Council 1997). The plan noted that the Malheur fields had been used for several decades. Grain farming will support greater sandhill crane use during the fall staging period, when a large percentage of the Central Valley population uses the Refuge. The Pacific Flyway Management Plan (Pacific Flyway Council 1997) recommended up to 400 acres of cereal grain production at Malheur Refuge to provide for staging cranes. The plan

also noted that autumn roosting habitat (large isolated wetlands, secure from human disturbance) should be maintained at Malheur Refuge.

This level was established with the assumption that grain farming would continue on the Refuge. Canada geese, dabbling ducks, and migratory grassland birds also benefit from grain farming since they use grain to build their fat reserves. Grain production also increases the Refuge’s carrying capacity for wintering Canada geese.

An additional purpose of the program is to limit the presence of invasive species by providing a mechanical tool to set back infestations and develop a stage for the restoration of native plant communities. Farming cultivation practices such as mowing, haying, and chemical application have been recognized as viable means to control invasive plant species and discourage the proliferation of non-beneficial plants.

Over the next several years the cropland farming program would be the main instrument for implementing Objective 4j in the CCP for Malheur Refuge. This action would support the goals and objectives outlined in the CCP for Malheur Refuge and the Pacific Flyway Council Management Plan for Sandhill Cranes (Pacific Flyway Council 1997).

**Availability of Resources**

Special equipment, facilities, or improvements necessary to support the use and maintenance costs are the responsibility of the cooperator with no associated expenses to the Refuge.

**Offsetting Revenues:** Because this use aids the Refuge in specific wildlife and habitat objectives and frees up maintenance staff equipment, materials, and personnel for other projects, there is the potential for overall cost savings for Refuge management activities. Since cooperative farming could represent a cost saving to the Refuge, there will be no fee associated with the agreement. The costs of administering and managing this use under Preferred Alternative 2 are detailed in Table B-18.

**Table B-18. Cost to Implement the Use**

Category and Itemization	One-time Cost	Annual (\$/yr)
Administration and management	\$2,000	\$2,000
Maintenance	\$0	\$0
Monitoring	\$1,000	\$1,000
Special equipment, facilities, or improvements	\$0	\$0
Offsetting revenues	\$0	\$0

**Anticipated Impact of the Use**

**Short-term Impacts:** Farming activities in proposed areas are currently taking place by force account (conducted by Refuge staff), so the nature of the disturbance will not be significantly different. The activity may cause some degree of disturbance to wildlife, including negative impacts on fauna that are not able to emigrate off-site during soil-disturbing activities. Any hydrologic impacts would be minimal (water needs of the actual crops would be served primarily through sub-irrigation). Wind

erosion will be marginalized by instituting best management practices such as crop residue management, eliminating or reducing fall cultivation practices. The sites already host significant invasive plant species and are currently being treated in cooperation with force account farming activities; thus, cultivation practices will have minimal impacts to native plant communities. With the size of the fields 50 acres or less, farming activities will have negligible effects to invertebrate, reptile, and amphibian populations and their movements. Disturbance to ground nesting birds should be minimal by delaying any mowing operations to after the nesting season.

Sandhill cranes, Canada geese, dabbling ducks, and grassland passerines benefit from grain farming since they use grain to build their fat reserves. Grain production also increases the Refuge's carrying capacity for wintering Canada geese. This activity provides for the early detection and treatment of invasive species, thereby creating a healthier environment for native plant communities. This is particularly important in areas targeted for native plant restoration.

**Long-term Impacts:** Farming activities may deplete the soil seed bank of native species over time, but due to the fact that these areas currently contain high percentages of noxious weeds in existing seed banks, the negative impact is offset by an increased level of control of non-desirable vegetation over time.

Cultivating annual crops may alter soil structure and wind erosion may occur. Whenever possible, cooperators will seek strategies to minimize this occurrence, such as timing and manner of tilling. The acreage being converted to farming is currently being farmed by force account and consists of 0.01 percent of Refuge lands. Therefore, the impacts noted above are expected to be negligible. Because farming is already taking place on these acres, this practice will likely have a neutral impact within the structure of the program.

Positive long-term benefits result in providing food/habitat for birds during critical migration period and minimizing crop depredation on neighboring lands.

**Cumulative Impacts:** Farming would only be practiced on lands that have been previously farmed. The proposed action is not expected to incrementally add to any other actions that are proposed or currently occurring in the area. The proposal benefits numerous wildlife species. This activity will not significantly impact other Refuge activities or actions and will not affect Refuge-wide or nationwide wildlife populations.

**Impacts to Listed Species:** There are no listed or endangered species on the Refuge. Greater sage-grouse (*Centrocercus urophasianus*) and the Great Basin Columbia spotted frog (*Rana luteiventris*) are designated as Federal candidate species for listing under the Endangered Species Act. Incidental post-breeding observations of sage-grouse have been made in recent years in the southeast portion of the Blitzen Valley. Spotted frogs have been documented in limited areas on the Refuge (Engle 2001; Pearl et al. 2010; Rombough and Engler 2010; ODFW 2011). But it is unclear at this time if the Refuge population is part of the Great Basin distinct population, which is the Federal candidate species, or if they belong to the Oregon population.

Although the Refuge has occurrences of these candidate species, it is anticipated that impacts from farming would be negligible and would not be expected to increase disturbance to candidate species any more than non-commercial uses. If uses result in unacceptable adverse effects to candidate species or habitats, the Refuge would impose restrictions to mitigate disturbance.

**Impacts to Priority Public Uses:** During operations, farming cooperators may occasionally flush wildlife from areas used by hunters, wildlife observers, photographers, anglers, or EE groups, but this conflict would be expected to be minimal. The presence of the crops, which may attract a variety of species, may support hunting, wildlife observation, wildlife photography, environmental education, and interpretation

### **Public Review and Comment**

Various opportunities were provided for the public to engage in the CCP planning process. Appendix J details public involvement undertaken during the development of the CCP/EIS. Written comments on this draft CD are welcome.

### **Determination**

\_\_\_\_\_ Use is Not Compatible  
  X   Use is Compatible with the Following Stipulations

### **Stipulations Necessary to Ensure Compatibility**

- This activity will be conducted under an annual CLMA or CFA specifying roles and responsibilities of the Service and each cooperator.
- Cooperators will only apply herbicides and fertilizers with prior Refuge approval.
- All weed control strategies and associated herbicides must be approved by the FWS and Pesticide Use Proposal procedures.
- Seeds must be certified weed free.
- Equipment must be thoroughly cleansed before entering the Refuge to prevent the introduction of new weed species or populations to the Refuge.

### **Justification**

Crop production has been shown to provide a cost-effective means of providing high-quality food source for target wildlife species at the Refuge. Specifically, crop production provides high-energy grain and forage crops, as well as green forage crops that are highly digestible and easily accessible. Wintering and migrating waterfowl and cranes readily use agricultural crop fields to help meet their energy needs. The use of a cooperator to produce grain crops may facilitate the management of croplands by increasing the reliability of a successful crop.

In addition, the food support crop production provides for target wildlife species and indirectly supports several wildlife-dependent recreational activities such as wildlife observation and photography.

By conducting the crop production program under the practices and stipulations described above, it is anticipated that wildlife species that could be adversely affected would find sufficient food resources and resting places so their abundance and use will not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, will prevent unacceptable or irreversible impacts to fish, wildlife, plants, and their habitats.

The cooperative farming program would contribute to achieving Refuge purposes and goals as identified in the 1990 Blitzen Valley Management Plan (Rule et al. 1990) and the Refuge System

mission by providing valuable foraging areas and conditions for sandhill cranes, waterfowl, and other wildlife. It also benefits other Refuge management actions by providing weed control and other habitat-maintenance functions.

The combination of management practices and stipulations identified above will ensure that crop production contributes to the enhancement, protection, conservation, and management of native wildlife populations and their habitats on the Refuge. As a result, crop production contributes to achieving Refuge purposes; contributes to the mission of the National Wildlife Refuge System; and helps maintain the biological integrity, diversity, and environmental health of the Refuge.

### **Mandatory Reevaluation Date**

09/2022 Mandatory 10-year Reevaluation Date (for all uses other than priority public uses)

### **NEPA Compliance for Refuge Use Decision**

X  Environmental Impact Statement and Record of Decision

### **References**

- Engle, J.C. 2001. Population biology and natural history of Columbia spotted frogs (*Rana luteiventris*) in the Owyhee Uplands of southwest Idaho: implications for monitoring and management. M.S. thesis. Boise State University, Boise, ID. 66 pages. Available at: <http://www.fws.gov/oregonfwo/Species/Data/ColumbiaSpottedFrog/>.
- ODFW. 2011. Greater sage-grouse backgrounder. Available at: [http://www.dfw.state.or.us/wildlife/sagegrouse/docs/Greater\\_Sage\\_Grouse\\_Candidate\\_speci es\\_Backgrounder.pdf](http://www.dfw.state.or.us/wildlife/sagegrouse/docs/Greater_Sage_Grouse_Candidate_speci es_Backgrounder.pdf) [sic].
- Pacific Flyway Council. 1997. Pacific Flyway management plan for the Central Valley Population of Greater Sandhill Cranes, Pacific Flyway Study Committee. Unpublished report. Portland, OR 44 pp. + appendices.
- Pearl, C.A., S.K. Galvan, M.J. Adams, and B. McCreary. 2010. Columbia spotted frog (*Rana luteiventris*) in southeastern Oregon: A survey of historical localities, 2009. U.S. Geological Survey Open File Report 2010-1235. 96 pp.
- Rombough, C. and J. Engler. 2010. Surveys for Columbia spotted frog (*Rana luteiventris*) at ARRA project sites, Malheur NWR. Report to USFWS from Rombough Biological. Princeton, OR. 13 pp.
- Rule, M., G. Ivey, D. Johnson, and D. Paullin. 1990. Blitzen Valley management plan. Malheur National Wildlife Refuge. Princeton, OR. 169 pp.

**Signatures:**

Prepared by: \_\_\_\_\_  
(Signature) (Date)

Refuge Manager/  
Project Leader  
Approval: \_\_\_\_\_  
(Signature) (Date)

**Concurrence:**

Refuge Supervisor: \_\_\_\_\_  
(Signature) (Date)

Regional Chief,  
National Wildlife  
Refuge System: \_\_\_\_\_  
(Signature) (Date)

