# Annual Raptor Nest Report, 2013

Boardman Conservation Area

Boardman, Oregon

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**Table of Contents**

## Introduction

The Nature Conservancy manages the Boardman Conservation Area (BCA) to protect and restore native plant communities and associated wildlife species (Nelson 2004). Four conservation target species, Washington ground squirrel (*Urocitellus washingtoni*), ferruginous hawk (*Buteo regalis*), loggerhead shrike (*Lanius ludovicianus*), and sage sparrow (*Artemisiospiza belli*), inform management activities on the BCA. The ferruginous hawk, the primary focus of this report, is a federal species of concern and state sensitive-critical species (Oregon Department of Fish and Wildlife (ODFW) 2008) that has experienced population declines and breeding range reductions due to habitat conversion, declines in prey species, and increases in human disturbance (Csuti et al. 1997). On the BCA ferruginous hawks nest primarily in isolated western juniper trees. The nests, which are often reused in subsequent years, are large structures composed of sticks and other debris, lined with leaves and other fine plant material. Potential nest sites are visited every 1-3 years to quantify and document ferruginous hawk breeding activity (Nelson 2004). We also document nesting of several other bird species which use similar nest structures during the course of this monitoring effort.

### Study Area

The 22,642-acre BCA is located southwest of Boardman, in northern Morrow County, Oregon, on properties owned by Threemile Canyon Farms. It is located within the Columbia Basin Section of the Columbia Plateau Ecoregion and is drained by two small tributaries, Willow Creek and Sixmile Creek, to the mainstem Columbia River. The climate in the Columbia Basin is semi-arid with hot, low precipitation summers and relatively cold winters. Average annual precipitation on the BCA ranges from approximately 9-11 inches. Southwesterly winds prevail throughout most of the year.

The BCA is part of a large block of native dominated shrub steppe and grassland habitat which has been identified as significant for conservation. Further, the BCA contains some of the best remaining grassland and shrub-steppe in the ecoregion. The BCA has high-quality occurrences of bitterbrush (*Purshia tridentata*) shrub steppe, big sagebrush (*Artemisia tridentata*) steppe, bluebunch wheatgrass (*Pseudoroegneria spicata*) grasslands and needle-and-thread (*Hesperostipa comata*) grasslands.

## Methods

I used a nest visit protocol based on methods described in Hegseth and Uchida (2010). This entailed revisiting previously discovered raptor nest sites (most of which are trees) and, from a distance, determining whether the nest site was active. Sites were included if they displayed evidence of previous raptor occupation, such as a nest or an accumulation of nesting materials. If a nest was observed I attempted to determine occupancy prior to approaching the site to limit disturbance to nesting raptors. If birds were not observed from the distant vantage point, I approached the site and assessed occupancy and nest condition. All attempts were made to minimize the time spent near active nests. Hegseth and Uchida (2010) defined occupancy as “observing a raptor in the incubation stage”. Due to the timing of the field visits in 2013 (relative to nesting phenology) I relaxed this definition to also include observations of nestlings and significant sign of use such as abundant white-wash, ejected pellets, and feathers or carcasses. The condition of unoccupied nests was assessed and classified as either intact or not-intact following Hegseth and Uchida (2010). Intact nests were those which appeared undamaged and in reusable condition. Nests which displayed damage or appeared unusable were considered not-intact. The locations of new nests were recorded using a Trimble Juno GPS (Trimble Navigation Limited, Sunnyvale, CA) running ArcPad 10 software (ESRI, Redlands CA). The first two digits

of each nest site number are the year of discovery and the second number is the unique site ID number. Numbers assigned to sites from previous years retained their year and nest ID number.

**Results**

I visited 83 raptor nest sites (76 historic and 7 new sites) on the BCA and adjacent properties over 5 days between May 30, 2013 and June 12, 2013 (Fig. 1). Nine historic sites were not visited and the 7 new nest sites were discovered while visiting historic sites and from reports by field staff and contractors. Birds from 6 species occupied 18 (22%) of the sites visited (Fig. 2). Of the 18 active nest sites, 7 (39%) were occupied by Swainson's hawks (*Buteo swainsoni*), followed by common raven (*Corvus corax*; *n* = 4 (22%)), ferruginous hawks (*n* = 2,( 11%)), great horned owl (*Bubo virginianus*; *n* = 2,( 11%)), red-tailed hawk (*Buteo jamaicensis*; *n* = 2,( 11%)), and loggerhead shrike (*n* = 1, (6%)). Most active nests were in western juniper (*Juniperus occidentalis*), the most abundant nest structure available on the BCA, other nesting substrates included cottonwood (*Populus trichocarpa*), and Russian olive (*Elaeagnus angustifolia*). Both ferruginous hawk nests were located in western juniper.

Ferruginous hawks often reuse nesting structures within territories (Dechant et. al 2003) and the structural integrity of nests may influence use. Of the historic nests visited over half (54%, *n* = 45) were intact (including active and inactive) while 35% (*n* = 29) were not intact and 11% (*n* = 9) had no tree or the tree was destroyed (Fig. 3).

Although the primary focus of this monitoring effort was to track ferruginous hawk nesting on the BCA, we also collected information on several other species of birds which use similar nest structures. Swainson's hawk, a state sensitive – vulnerable species (ODFW 2008), commonly nest on the BCA and were the most frequently encountered species in 2013 (Fig. 2). Loggerhead shrikes, another state sensitive – vulnerable species (ODFW 2008), was rarely encountered in this survey, however, a separated species –specific survey conducted in the spring of 2013 produced strikingly different results with nearly 40 active nests. This discrepancy was not surprising as loggerhead shrikes construct small cup nests in large shrubs and small to medium sized trees and these nests could have been easily overlooked while searching for the large stick nests in the large juniper trees often used by ferruginous hawks. Given this survey limitation, I omitted all small raptors (i.e. American kestrel and loggerhead shrikes) and exclusively ground nesting birds (i.e. burrowing owls) from further results to avoid misrepresenting the abundance of breeding occurrences of these species on the BCA.

In addition to reporting results from 2013, I also summarized results from surveys conducted every 1-3 years over the last decade (2003-2013; *n* = 7). Although these results are informative, caution should be used when comparing among years due to differences in survey effort, methodology, and timing. For example, there was apparently very low sampling effort in 2006 while the 2013 surveys occurred relatively late in the breeding season compared with prior surveys. Keeping these limitations in mind, in general, there have been a moderate number of nesting raptors and large corvids per year on or adjacent to the BCA over the last decade ($\bar{x}$ = 15.3, *n* = 7; Fig. 4). Most observations are from 2 species, ferruginous hawks (26% of observations, *n* = 28) and Swainsons' hawk (45% of observations, *n* = 49). On average, ferruginous hawks occupied 4 nests per year (range 2-7, *n* = 7) while Swainson's hawks occupied 7 (range 2-16, *n* = 7). The remaining 6 species, barn owl, common raven, golden eagle, great-horned owl, long-eared owl, and red-tailed hawk, comprise only 29% of active nests (Table 1).

## Discussion

Numerous factors may influence ferruginous hawk breeding activity including: habitat availability, prey abundance, intra and interspecific competition, and anthropogenic disturbance (Dechant et al. 2003, Keeley and Bechard 2011, Schmutz et al. 2008, Smallwood et al. 2009) among others. Conservation efforts on the BCA are primarily focused on vegetation management with the intent of protecting, maintaining, and restoring native bunchgrass and shrub-steppe ecosystems and thereby provide critical habitat for at-risk species, such as ferruginous hawks, and other wildlife species (Nelson 2004). This is accomplished through a combination of invasive weed control, fire suppression, habitat restoration, protection from disturbance by vehicles, and domestic ungulate management. Additionally, a 250 ft no-spray buffer along the BCA boundary may provide additional protection for nesting raptors by minimizing exposure to potentially harmful chemicals.

Although these actions have resulted in numerous habitat improvements (Nelson 2012) the stated objective of maintaining an average of five successful ferruginous hawk nests over any 5 year period (Nelson 2004) has not been met within the last decade. Although the reasons for not meeting this objective are unknown, there are several actions which could be implemented to help achieve this objective. They fall into 2 categories 1) improving survey methods to more accurately estimate the number of hawks using the BCA and 2) management recommendation for further minimizing direct disturbance to nesting ferruginous hawks. These items will be addressed in the order presented.

Recommendations for improving surveys: 1) Initiate surveys earlier in the season to capture early nesting attempts. Ferruginous hawks breed from approximately mid-March through July, incubation lasts for approximately 28 days and young fledge about two months after hatching (Csuti et al. 2001). On the BCA, eggs were laid in early April and young fledged in late June in 1991 and 1992 (ODFW 1993 as reported in Multi-Species Candidate Conservation Agreement with Assurances (MSCCAA) 2004). Conducting nest site visits in mid to late April may capture nesting attempts missed by later surveys. Alternatively, consider conducting two visits per breeding season to capture early and late season activity. 2) Survey potential nest trees in addition to visiting historic nests. Ferruginous hawks maintain large territories (Csuti et al. 2001) and although nest site reoccupancy is common, one of several nests within a territory may be used in alternate years (Atkinson 1992, Olendorff 1993). Further, nest reoccupancy may be affected by nest success (De Smet 1992).

Management recommendations: Increase the use of buffer zones to reduce disturbance to active nests. Nesting ferruginous hawks are sensitive to human disturbance (Dechant et al. 2003). Human disturbance can cause nest desertion or low productivity, especially where prey populations are low (Dechant et al. 2003). Disturbed nests fledge fewer young, and they often are not reoccupied the year following disturbances (White and Thurow 1985). Rather than becoming acclimated to repeated disturbance, ferruginous hawks become sensitized and flush at greater distances, which may result in increased clutch or brood mortality due to exposure, predation, starvation, or nest desertion (White and Thurow 1985). The MSCCAA (2004) states that TNC will maintain a buffer zone of 0.6 miles around known active ferruginous hawk nest sites on the BCA. Within these buffer zones human use will be limited to essential travel during the nesting season (March 1 to July 15). Early identification of active nest sites will facilitate implementation of this conservation measure and should reduce disturbance to nesting hawks. All employees and contractors should be informed about travel and work restrictions within buffer zones (MSCCAA 2004).

In combination, these recommendations should improve estimates of ferruginous hawk nesting while reducing disturbance to nesting hawks and help achieve stated management objectives.

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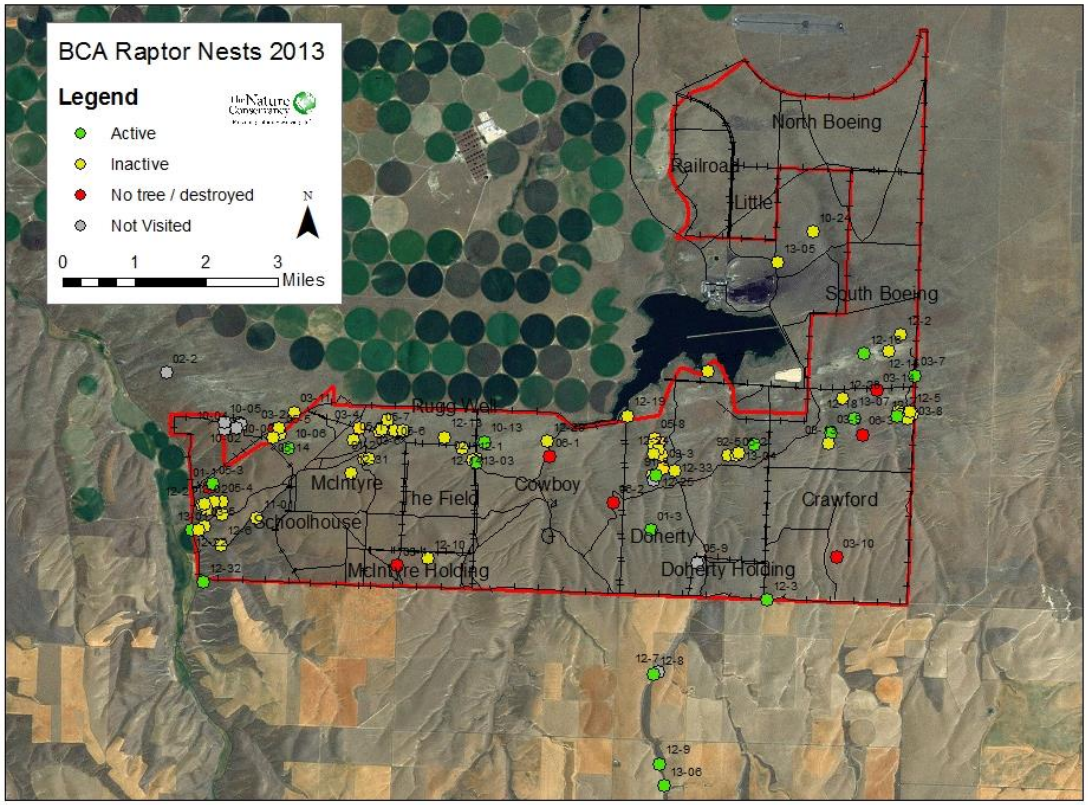


Figure 1. Most historic raptor nest sites are located in a central band on the BCA where numerous large widely-spaced western juniper trees grow. Note: several nest sites are located on lands which border the BCA.

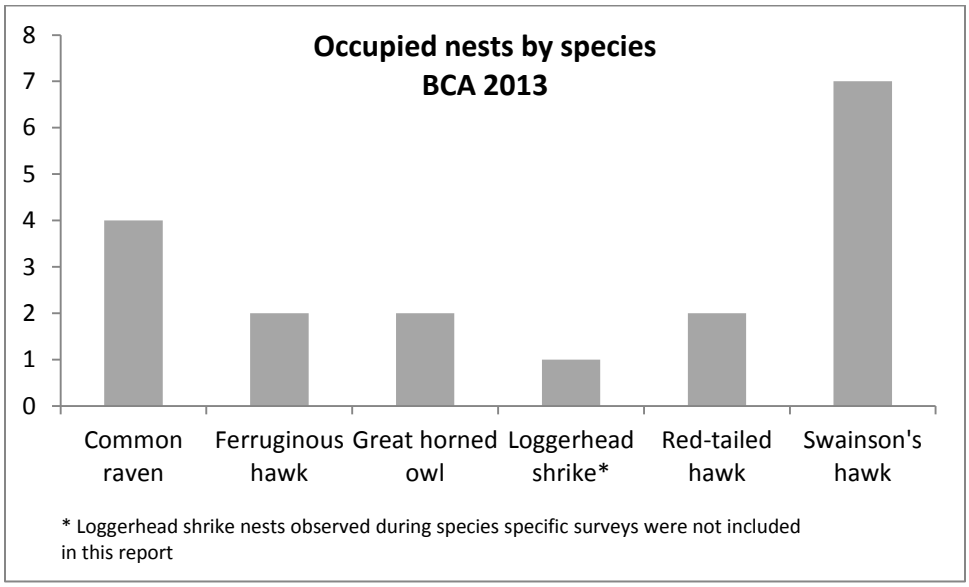


Figure 2. Six bird species occupied 18 nest sites on or adjacent to the BCA in 2013.

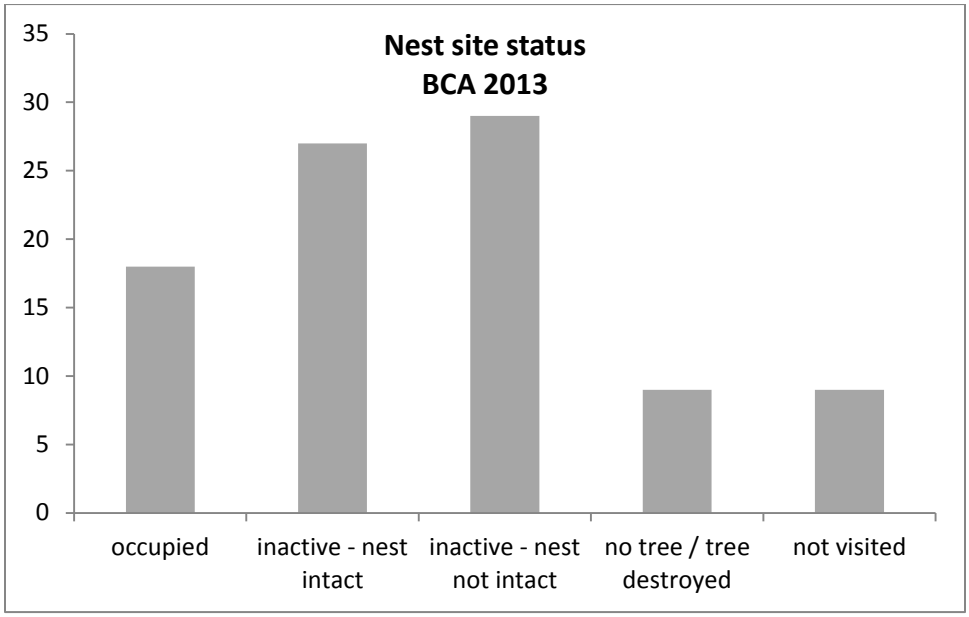


Figure 3. Seventy-six historic and 7 new nest sites were visited in 2013. Half (50%) of sites visited had intact nests (including occupied and inactive-nest intact).

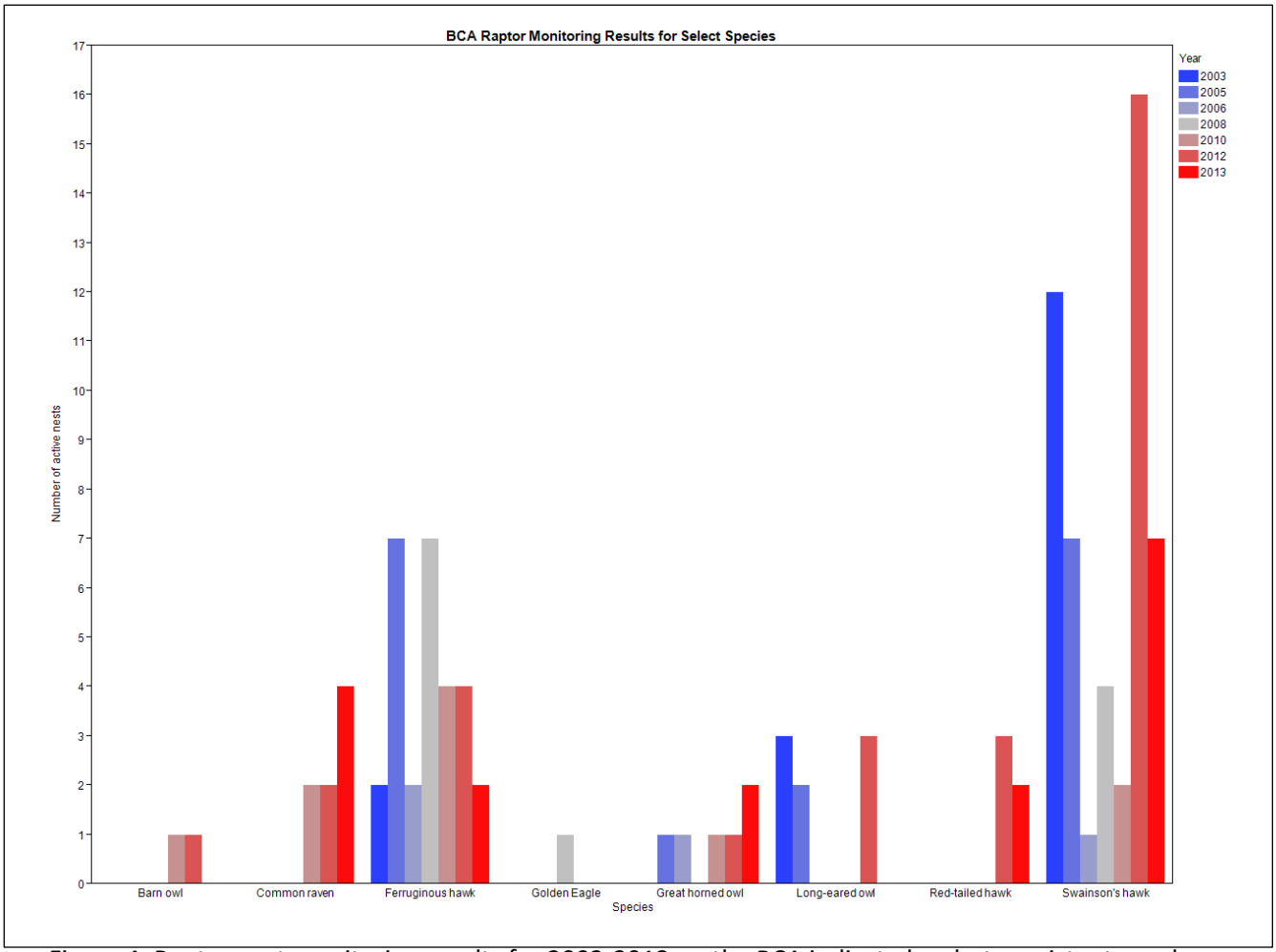


Figure 4. Raptor nest monitoring results for 2003-2013 on the BCA indicate low but persistent numbers of nesting ferruginous hawks and variable yet often abundant numbers of nesting Swainson's hawks. Note: results for American kestrel, loggerhead shrike, and burrowing owls were excluded because these species were rarely encountered during raptor nest site surveys.

Table 1. The number of active nests by species for all years 2003-2013.

| Species | Number of Active Nests (% of total) |
|---|---|
| Barn owl | 2 (2) |
| Common raven | 8 (7) |
| Ferruginous hawk | 28 (26) |
| Golden Eagle | 1 (1) |
| Great horned owl | 6 (6) |
| Long-eared owl | 8 (7) |
| Red-tailed hawk | 5 (5) |
| Swainson's hawk | 49 (46) |