8.1 Raven Nest Surveys

The Common Raven (*Corvus corax*) is a native bird that adapts well to human disturbance and land development, and is adept at utilizing resultant food, water, and nest-site subsidies. Ravens prey on Sage-grouse eggs and chicks and consequently may directly impact Sage-grouse, which DOE-ID is striving to conserve in partnership with other federal, state, and private stakeholders. Raven observations during annual breeding bird surveys on the INL Site have steadily increased over the past 30 years (ESER, unpublished data), mirroring trends across western North America (Sauer et al. 2014).

In the CCA for Greater Sage-grouse, DOE-ID committed to support research aimed at developing methods to deter Raven nesting on utility structures (Conservation Measure 10; DOE and USFWS 2014). Later, this scope broadened into a commitment from DOE-ID to work with INL contractors and others to opportunistically reduce raven nesting on any anthropogenic structure, including power lines, towers and structures at facilities (Sec. 6.2.7). The DOE-ID continues to recognize the value of research that would improve its ability to deter Raven nesting on power lines, but it also recognizes that some Raven nesting on towers and at facilities could be deterred by simple methods employed at appropriate times. Hence, DOE-ID now encourages ESER to collaborate with contractors and the National Oceanic and Atmospheric Administration (NOAA), to seek opportunities to reduce the suitability of any human structures most likely to be used for nesting.

In support of the original CCA conservation measure to develop effective nest deterrents, and the recently expanded scope, ESER established and continues to operate an annual Raven nest monitoring program. Under this monitoring program, nearly all infrastructure on the INL Site are monitored during April and May when Ravens typically build nests and care for eggs and chicks. The purpose of the task is three-fold: (1) to determine how many Raven nests are built on INL Site infrastructure and to track annual trends; (2) to identify structures and stretches of power line favored by Ravens for nesting, which may be candidates for retrofitting; and (3) to allow ESER to evaluate the effectiveness of deterrents after they are installed.

Between April 2 and June 1, 2018, all power lines were systematically surveyed (transmission lines = 231 km [143 mi], distribution lines = 37 km [23 mi] – see Howe et al. [2014] for a description of power line dimensions and attributes), towers, raptor nesting platforms and facilities on the INL Site that had been surveyed the previous year (Shurtliff et al. 2018), following methods described elsewhere (Shurtliff et al. 2015). All power line segments were surveyed four times, with each survey being separated by at least 14 days. Facilities, towers, and other infrastructure were surveyed at least twice, primarily in April. If a nest was seen on a structure, but its activity level could not be confirmed, the nest was revisited again before the next formal survey commenced. As a result, nests that remained unconfirmed throughout the nesting season were visited twice as often as nests with confirmed activity. This level of effort increased our confidence at the end of the season that remaining unconfirmed nests had not been occupied by Ravens during the breeding season.

In 2018, ESER observed 43 active Raven nests on man-made structures or in trees associated with facilities (this is an adjusted total, after considering observations of nests likely built after a first nest fell to the ground – see Shurtliff et al. 2019). Thirty-one of the 43 nests (72%) were on power line structures, all of which were transmission structures or

lattice structures used for cyber-security testing (i.e., none were on single-pole distribution structures). Fourteen nests on power line structures (45%) were inside or bordering the SGCA.

Biologists surveyed 12 facilities and recorded eight nests at seven of them (Table 8-1). Two nests located at a single facility included one nest inside the fence of the Materials and Fuels Complex and one nest on the nearby Transient Reactor Test Facility. During 2018, Ravens nested at the same facilities as in 2017, with three exceptions. No Raven nests were observed at the Critical Infrastructure Test Range Complex this year, nor at the Sheep Station, as already noted. However, for the first time since surveys began, a Raven nest was documented at the Materials and Fuels Complex (Shurtliff et al., 2018, 2019).

Table 8-1. Facilities Surveyed for Raven Nests in 2018.

Facility	# Times Surveyed	Days Between Surveys[a]	Active Raven Nest Confirmed	Substrate Supporting Active Nest
Advanced Mixed Waste Treatment Project/Radioactive Waste Management Complex	2	14 & 15[b]	Yes	Building Platform
Central Facilities Area Main Gate	2	14	Yes	Building Platform
Critical Infrastructure Test Range Complex	2	17	No	N/A
Experimental Breeder Reactor I	2	14	Yes	Building Platform
U.S. Sheep Experiment Station	2	19	No	N/A
Idaho Nuclear Technology and Engineering Center	2	15	Yes	Effluent Stack
Materials and Fuel Complex/ Transient Reactor Test Facility	2	14	Yes (2 nests)	Building Platform
Naval Reactors Facility (NRF)	2[c]	16	Yes	Ornamental Tree
Specific Manufacturing Capability/Test Area North	2	22	Yes	Building Platform
Advanced Test Reactor Complex	2	14	No	N/A
Central Facilities Area	2	15	No	N/A
Highway Department	2	19	No	N/A

a. The number of days between surveys is indicated, although individual nests with unconfirmed activity statuses were sometimes revisited more frequently.
b. Due to scheduling constraints, survey are not always conducted at the two facilities that adjoin each other on the same day.
c. Environmental Surveillance, Education, and Research personnel are restricted from entering the NRF. Therefore, several years ago an NRF representative was trained, and reports to ESER two times each season on Raven nest observations.

In addition to facilities, Ravens maintained nests on two cellular phone towers located near the INL Site boundary and on two meteorological towers operated by NOAA (Figure 8-5).

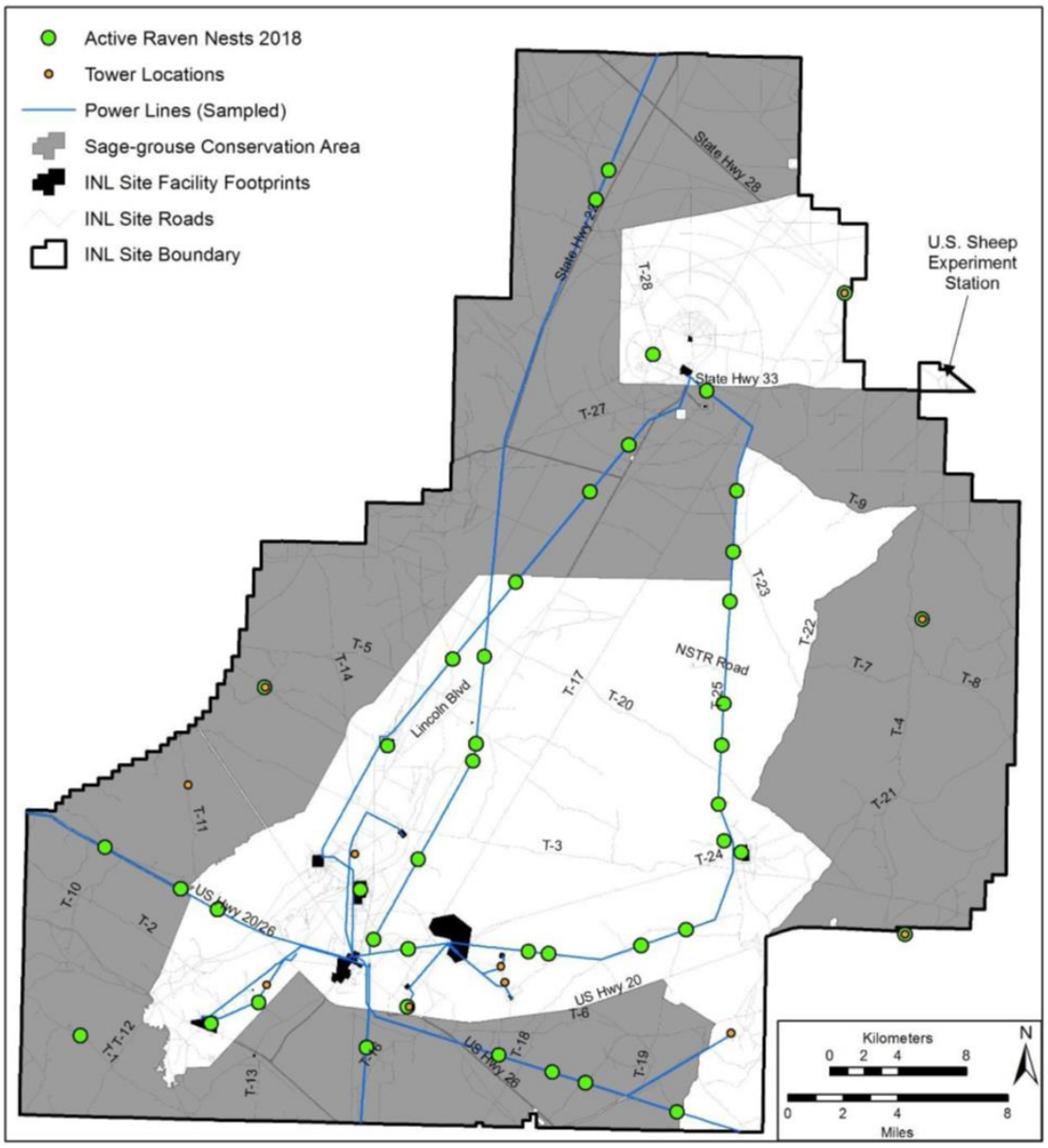

Figure 8-5. Results of 2018 Raven Nest Survey. *Raven nests displayed represent adjusted nest locations (n = 43).*

The adjusted number of Raven nests recorded on the INL Site was 5% higher in 2018, compared to 2017, and is nearly identical to the peak number observed in 2016 (Figure 8-6). One caveat is that the number of Raven nests reported last year may have been slightly overestimated. In 2017, ESER reported three Raven nests at the U.S. Sheep Experiment Station (Sheep Station; Shurtliff et al. 2018); however, investigators now believe some if not all three nests were occupied by American Crows (*Corvus brachyrhynchos*; see Shurtliff et al. 2019). If the three nests were mistakenly attributed to Ravens, the 2017 total would have been 38 Raven nests. Thus, the 2018 Raven nest count would be 13% higher than in 2017. Regardless of whether the Sheep Station nests were occupied by American crows or Ravens, results suggest that the number of Raven nests on anthropogenic substrates has been stable on the INL Site for at least the past three years. If Ravens indeed occupied fewer nests in 2017 than were reported, the current conclusion of a stable trend would extend to the past four years.

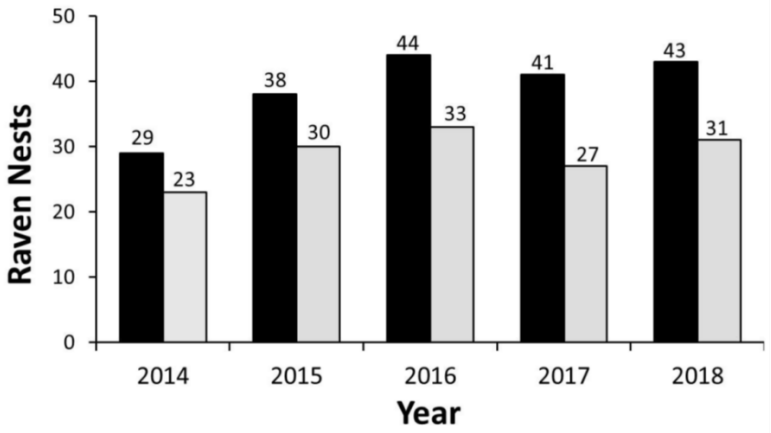

Figure 8-6. Adjusted Number of Common Raven Nests Observed on Idaho National Laboratory Site Infrastructure. *Black bars represent total nest counts and gray bars represent nests on power lines. Total nest count in 2017 may have been overestimated by two or three nests (see above).*

DOE-ID does not own any of the weather monitoring or cellular service towers occupied by Ravens in 2018, and therefore it cannot make a unilateral decision to install nest deterrents. ESER continues to work with NOAA to improve the placement of hardware cloth on two towers which have been used for nesting for several years. Hardware cloth installed by NOAA technicians last year did not adequately cover the most likely nesting sites on the towers, but NOAA intends to add more hardware cloth at the end of 2018.

Conservation Measure 10 in the CCA specifically identifies utility structures as the target for nest deterrent experiments because most Raven nests on anthropogenic structures are on power transmission structures. Since the CCA was signed however, several factors have reduced the priority of this conservation measure relative to other ongoing or potential actions that can or could be taken to address threats to Sage-grouse (Shurtliff et al. 2019). Furthermore, most power line sections that support Raven nests are outside the SGCA—the primary area of focus for the conservation of Sage-grouse. No known studies in similar sagebrush steppe habitat have determined the territory size of breeding Ravens; also, it is not known if there is any study in similar habitat that documents how far nesting Ravens will travel to forage. Thus, it is not known whether the majority of Ravens on power lines forage in the SGCA. Understanding Raven foraging behavior may be a more important priority than installing nest deterrents because the latter would be a much greater cost and could potentially be unnecessary if most nest-tending Ravens don't forage in the SGCA.