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Title: Los Alamos National Laboratory Fall Avian Migration Monitoring Report 2010-12

Author(s): Hathcock, Charles D.
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Intended for: Report
Environmental Programs

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EXECUTIVE SUMMARY

During the fall of 2012, Los Alamos National Security, LLC (LANS) biologists completed the 3rd year of monitoring fall migration passerines (songbirds) at Los Alamos National Laboratory (LANL). Songbirds were captured at a mist-netting station located in a large wetland/riparian complex in Technical Area (TA)-36 on the north side of Pajarito Road in Los Alamos County. Captured birds were identified, measured, and banded with a U.S. Fish and Wildlife Service (USFWS) migratory bird band. Banding operations took place between 7 August and 10 October 2012 with the completion of a total of ten mist-netting sessions. This project was conducted as part of implementation of the Biological Resources Management Plan (BRMP) and is in compliance with the 2006 Memorandum of Understanding (MOU) between the USFWS and the Department of Energy (DOE)/National Nuclear Security Administration (NNSA) and Executive Order 13186.

Four hundred and forty three birds, representing 49 species, were banded in 2012. Broad-tailed, Black-chinned, Calliope and Rufous Hummingbirds were also captured in August and September but are not analyzed as part of this project. Between 2010 and 2012 the overall number of birds captured has been variable, but in 2012 the number of captures improved substantially compared to 2011. The warblers were the most affected species and their numbers remained significantly down from 2010. The variability in bird populations are likely driven by regional climatic factors.

INTRODUCTION

In 2012, LANS biologists completed the 3rd year of a monitoring effort to document fall migration patterns of passerines (songbirds) at LANL. Counts and captures of spring and fall migrants can generate useful information on the status and trends of the source populations (Hussell and Ralph 2005). Birds were captured and banded with USFWS migratory bird bands. Banding operations took place between 7 August and 10 October 2012 with the completion of a total of ten mist-netting sessions.

LAWS AND RESTRICTIONS

The Migratory Bird Treaty Act of 1918 (MBTA) is the primary driver for protection of migratory birds in the United States. The original 1918 statute implemented the 1916 Convention between the U.S. and Great Britain (for Canada) for the protection of migratory birds. Later amendments implemented treaties between the United States (U.S.) and Mexico, the U.S. and Japan, and the U.S. and the Soviet Union (now Russia). Under the MBTA, migratory birds are defined as all native birds in the U.S., except for non-migratory species, such as quail and turkey, which are managed by individual states.

In 2001, Executive Order 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds* was signed. Under Executive Order 13186, the USFWS issued Director's Order 172 on Service Guidance to Conserve Migratory Birds. Identifying goals for federal program activities, the USFWS highlighted the need to identify means and measures to avoid and/or minimize potential for take of migratory birds, eggs, and active nests.

In support of Executive Order 13186, on August 1, 2006, a MOU was finalized between the USFWS and the DOE regarding the implementation of the MBTA at DOE facilities. Under the MOU, subject to the availability of appropriations and in harmony with the DOE/NNSA missions and capabilities, the DOE agreed to several actions. The full MOU can be found in Appendix 1.

Section **6b** of the MOU drives LANL's monitoring activities under the Biological Resources Management Plan (LANL 2007; BRMP). Additionally, the Migratory Bird Best Management Practices Source Document for Los Alamos National Laboratory, Revised November 2011 (LANL 2011), addresses how LANL mitigates impacts to migratory birds at an institutional level and also identifies the need to monitor migratory birds to detect trends in populations at LANL.

PERMITS

The principal investigator has a master banding permit from the Federal Bird Banding Laboratory in Maryland; a federal permit from the USFWS that covers incidental banding of migrant Willow Flycatchers; a state permit from the New Mexico (NM) Department of Game and Fish authorizing birds to be banded in NM; and an approved Institutional Animal Care and Use Committee protocol at LANL to ensure compliance with the Animal Welfare Act. LANS biologists report their banding data to the Federal Bird Banding Laboratory and results to NM Department of Game and Fish each year.

SITE LOCATION

The fall migration monitoring banding site at LANL is comprised of twelve mist-nets deployed in the upper end of the Pajarito wetlands complex. The wetlands complex is on the north side of Pajarito road in TA-36, along the dirt road that was built when regional monitoring well R-54 was installed in 2009. The twelve mist-nets are placed on the northern side of the wetlands, away from Pajarito road (Figure 1). This wetlands complex is comprised of primarily narrowleaf cottonwood (*Populus angustifolia* James), narrowleaf willow (*Salix exigua* Nutt.), and broadleaf cattail (*Typha latifolia* L.) (Figure 2).

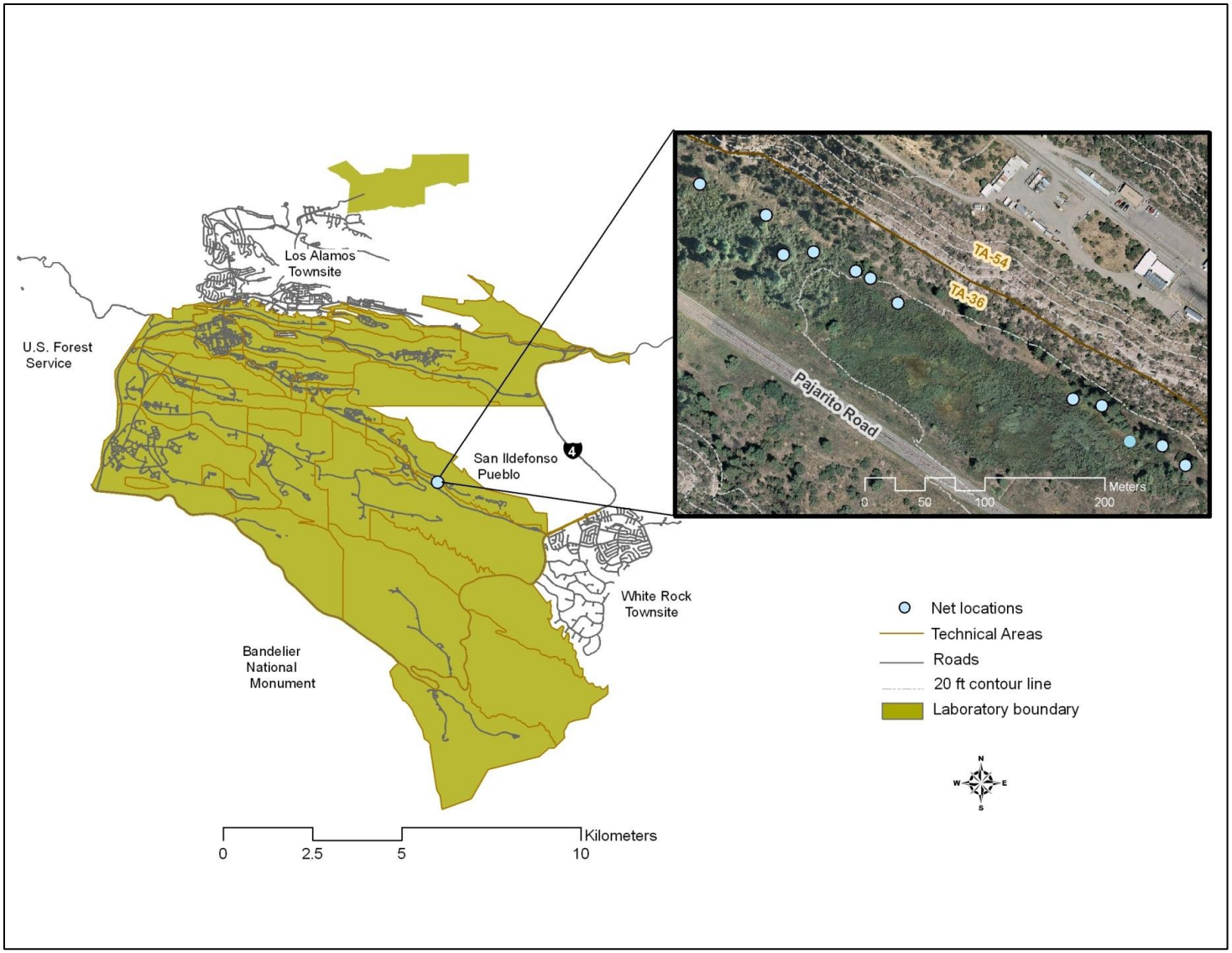

Figure 1. Location of the fall migration monitoring banding site at LANL.

Figure 2. Photograph of the wetlands where the banding site is located, looking east.

METHODS

The banding station used twelve 12-meter-long mist-nets with 30 millimeter mesh (Figure 3). Net locations were placed strategically to maximize the number of birds captured. Methods for net placement are available in Bub (1996). A standard USFWS numbered band was put on each bird. The size of the band followed the requirements in the Bird Banding Manual (Gustafson et al. 1997). All birds were identified, aged, sexed, weighed, measured, fat scored, and checked for signs of molt. The aging and sexing criteria were based on Pyle (1997). The times that the nets were opened and closed and the weather conditions at opening and closing were also recorded. Of primary importance was the safety and welfare of the personnel and birds.

Figure 3. An open mist-net.

Bird captures were summarized by date. A "net hour" is a unit of measure used to calculate the amount of time that nets are open. One net that is open for one hour is equal to one net hour. The daily birds per net hour was calculated by taking the number of birds per day and dividing it by the total net hours per day. The total birds per net hour for the entire fall monitoring period was also calculated.

Abundance values for the top 10 species in total number captured were calculated. The abundance value is a number that will reflect the status of a selected species at a particular location in comparison with other years (Woodward and Woodward 1977).

$$\text{Abundance} = \frac{\text{Total number of individuals for the selected species, including returns}}{\text{Total number of net hours for the period of occurrence of a selected species}}$$

To obtain a whole number it is necessary to multiply the results by 100 to equal the abundance of birds per 100 net hours.

The Shannon's diversity index (H) (Shannon 1948) will be used to examine species diversity by year. This diversity index is a popular measure in ecology that is used to describe both the species richness and relative abundance of each species in a community. The Shannon's H can range from 0.0 to 4.6, where larger values represent increasing diversity. H is calculated using the following formula:

$$H = -1 (pi (\ln (pi))$$

Where pi is a percentage value of a specific species in the total population and ln is the natural log.

Another useful measure is the Shannon's equitability estimate (EH) which is a measure of evenness in the population. This measure ranges from 0 to 1 where one represents a completely even community in which all of the species' abundances are equal. The Shannon's EH is calculated using the following formula:

$$EH = H/\ln S$$

Where S is species count, ln is the natural log, and H is the Shannon's diversity index.

The Shannon's indices between years were compared using bootstrapping techniques with a 1000 sample permutation.

The data are maintained by LANS biologists.

RESULTS

Banding operations took place on ten mornings between 7 August and 10 October 2012. The dates were August 7, 15, 22, 29, September 5, 12, 19, 20, October 3, and 10, 2012. The nets were opened before sunrise and closed between noon and 1:00 p.m. The total net hours for this year's fall migration monitoring project were 641.2 net hours. A 12^{th} net was added to the station in 2012 resulting in a greater number of net hours for the project compared to previous years. A total of 443 birds, representing 49 species, were banded. Broad-tailed, Black-chinned, Calliope,

and Rufous Hummingbirds were also captured and banded in August and September, but are not analyzed as part of this project. The number of birds banded per net hour for the project was 0.78. Table 1 details the numbers of species and when they were captured. The top five species in total number banded in 2012 were the Lesser Goldfinch, Bushtit, American Robin, Ruby-crowned Kinglet, and Wilson's Warbler. Table 2 lists the top 10 species in total number over the history of the project along with the abundance in 2012, percent of the birds aged as hatch-year in 2012, the 2012 arrival date and departure date.

The percentage of birds that are hatch-year (young) birds during migration is important to examine because it provides estimates of annual nesting success. Kelley and Finch's (2000) work showed that sample variation of age ratios resulting from the sampling methodology goes down as the number of days of effort increases. Due to the fact that this project was only ten days of effort, inferences on age ratios are not as robust, and thus have a higher amount of variation. However, year-to year comparisons can still be made. The percentage of hatch-year birds for the site was 57%. This is similar to 2010 and 2011, in which the overall percentage of hatch-year was 57% and 56% respectively.

In 2012, the percentage of birds captured with fat scores greater than 1 (on a scale of 0–5) was 42% for the site overall, with many of the migratory species having large fat deposits. This was similar to past years and is indicative of birds in transit. The sex of the birds was recorded when it was apparent, though most of the birds were sexed as unknown. In the fall, many of the sexual characteristics used to determine the sex of birds have diminished and plumage characteristics in hatch-year birds are often not distinctive to determine sex.

Migration peaked on 5 September with the banding of 44 birds. The site peaked again with the banding of 71 birds on 3 October, but the majority of these birds were species known to over-winter in Los Alamos, such as the White-crowned Sparrow. However, some migrant species, like the Orange-crowned Warbler, were still present on this day.

The Shannon diversity index showed diversity increasing over the three years with values of 2.764, 3.005, and 3.123 for 2010, 2011, and 2012 respectively. The Shannon's equitability showed that the evenness of the bird communities was similar across the three years, 0.739, 0.875, and 0.802. Bootstrap permutations were used to compare the diversity indices between the three years. The diversity in 2010 was statistically different than 2012 ($p = 0.001$) and moderately significant from 2011 ($P = 0.14$). There were no differences between 2011 and 2012.

DISCUSSION

All 443 birds captured and banded during this project are protected under the MBTA. Additionally, several species captured at the banding site are considered Birds of Conservation Concern from region 16, the Southern Rockies/Colorado Plateau region (USFWS 2008), including the Willow Flycatcher, Juniper Titmouse, Grace's Warbler, and Brewer's Sparrow. The primary statutory authority for Birds of Conservation Concern is the Fish and Wildlife Conservation Act of 1980. Another conservation tool used in migratory bird management is the Birder's Conservation Handbook (Wells 2007), which is a list of the top 100 birds most at risk in North America. Five bird species captured during this project are in the Birder's Conservation Handbook: the Olive-sided Flycatcher, Rufous Hummingbird, Grace's Warbler, Virginia's Warbler, and Brewer's Sparrow. Several other species on this list are frequently seen in this wetlands complex as well.

Since 2010, bird captures were significantly lower in 2011 (Hathcock et al. 2012) but seemed to have recovered in 2012. However, warblers were the hardest hit group and their numbers were still significantly down in 2012 (Figure 4). Birds were grouped into one of three diet classifications for further analysis. The classifications were based on life history information available from Cornell's *The Birds of North America Online* (BNA 2012). The three groups were 1) granivores, where diet consists primarily of seeds; 2) insectivores, where diet consists primarily of insects; and 3) omnivores, where the diet is split evenly between the two. After grouping birds into these classifications, it is apparent that insectivores are still lower in numbers from 2010 and granivores have increased. This increase is largely due to the large increase in the number of Lesser Goldfinches banded this fall (Figure 5).

There are other fall monitoring stations in northern New Mexico. At nearby Bandelier National Monument, there are two long-term fall monitoring sites. 2012 numbers improved dramatically at this site from 2011 as well (Stephen Fettig, Personal Communication). These regional changes in bird populations are likely due to ongoing environmental factors, such as drought in the southwestern United States.

	8/7/2012	8/15/2012	8/22/2012	8/29/2012	9/5/2012	9/12/2012	9/19/2012	9/20/2012	10/3/2012	10/10/2012	Total
American Robin	1					1	4		11	13	30
Audubon's Warbler									1	2	3
Bewick's Wren	1						2	2			5
Black-headed Grosbeak	1										1
Blue-gray Gnatcatcher			1								1
Brewer's Sparrow		1		2	1	1					5
Bushtit		14	1	1	13	2		2	3	2	38
Canyon Towhee			1							1	2
Chipping Sparrow		2	2	2	2				1	1	10
Downy Woodpecker		1									1
Dusky Flycatcher			1		1	1					3
Flicker Intergrade										1	1
Grace's Warbler	1										1
Gray-headed Junco							1		6	7	14
Green-tailed Towhee					2	2					4

Hairy Woodpecker		**1**				**1**					**2**
Hepatic Tanager	**4**	**1**									**5**
Hermit Thrush							**1**	**1**	**1**	**2**	**5**
House Finch	**1**	**4**			**2**						**7**
House Wren			**2**	**2**							**4**
Juniper Titmouse	**1**	**2**									**3**
Lazuli Bunting					**1**						**1**
Lesser Goldfinch	**5**	**16**	**17**	**17**	**5**	**8**	**5**	**8**	**11**	**6**	**98**
Lincoln's Sparrow							**1**	**2**			**3**
MacGillivray's Warbler				**2**	**3**	**2**		**1**		**1**	**9**
Mountain Chickadee	**1**	**2**				**1**	**2**	**1**	**1**	**1**	**9**
Olive-sided Flycatcher						**1**					**1**
Orange-crowned Warbler				**1**	**1**		**1**		**1**	**2**	**6**
Oregon Junco							**1**		**5**	**19**	**25**
Pine Siskin	**3**						**1**				**4**
Plumbeous Vireo	**1**	**1**	**1**								**3**
Pygmy Nuthatch		**1**							**1**		**2**
Red-naped Sapsucker	**1**						**1**				**2**

Red-shafted Flicker									4	1	5
Rock Wren		1									1
Ruby-crowned Kinglet							3		15	10	28
Song Sparrow									1		1
Spotted Towhee	5	3			3			1	1	1	14
Townsend's Warbler					1						1
Virginia's Warbler	2	3	3	3	1	2	1				15
Warbling Vireo		1	2	4							7
Western Scrub-Jay		2		2	1		2	1			8
Western Tanager	1				1						2
Western Wood-Pewee	1	1	2			1					5
White-crowned Sparrow							1		6	7	14
Williamson's Sapsucker	1	1						1			3
Willow Flycatcher				1							1
Wilson's Warbler			3	5	6	5	3	3	2		27
Yellow Warbler			1	2							3
Grand Total	31	58	37	44	44	28	30	23	71	77	443

Table 1. Summary of birds banded in 2012.

Bird Name	2012 Total	2011 Total	2010 Total	2012 Abundance per 100 Net Hours	2012 Percent Hatch Year	2012 Arrival Date	2012 Departure Date
Lesser Goldfinch	98	20	23	15.3	32%	Year-round[3]	Year-round[3]
Audubon's Warbler	3	5	119	2.5	66%	Seen Prior[1]	Ongoing[2]
Virginia's Warbler	15	10	58	3.3	13%	Year-round[3]	Year-round[3]
Ruby-crowned Kinglet	28	4	40	11.3	71%	19-Sept	Ongoing[2]
Wilson's Warbler	27	11	32	5.9	96%	22-Aug	Early Oct
White-crowned Sparrow	14	18	33	5.6	43%	19-Sept	Ongoing[2]
Orange-crowned Warbler	6	8	44	1.4	66%	29-Aug	Ongoing[2]
Bushtit	38	12	0	5.9	79%	Year-round[3]	Year-round[3]
American Robin	30	2	2	4.7	73%	Year-round[3]	Year-round[3]
Oregon Junco	25	1	1	10.1	64%	19-Sept	Ongoing[2]

Table 2. Top ten species in number banded across all years. [1]Seen Prior: Observed at this site prior to first capture date; [2]Ongoing: Observed at this site after the project completion; [3]Year-round: Known to occur at this site year-round.

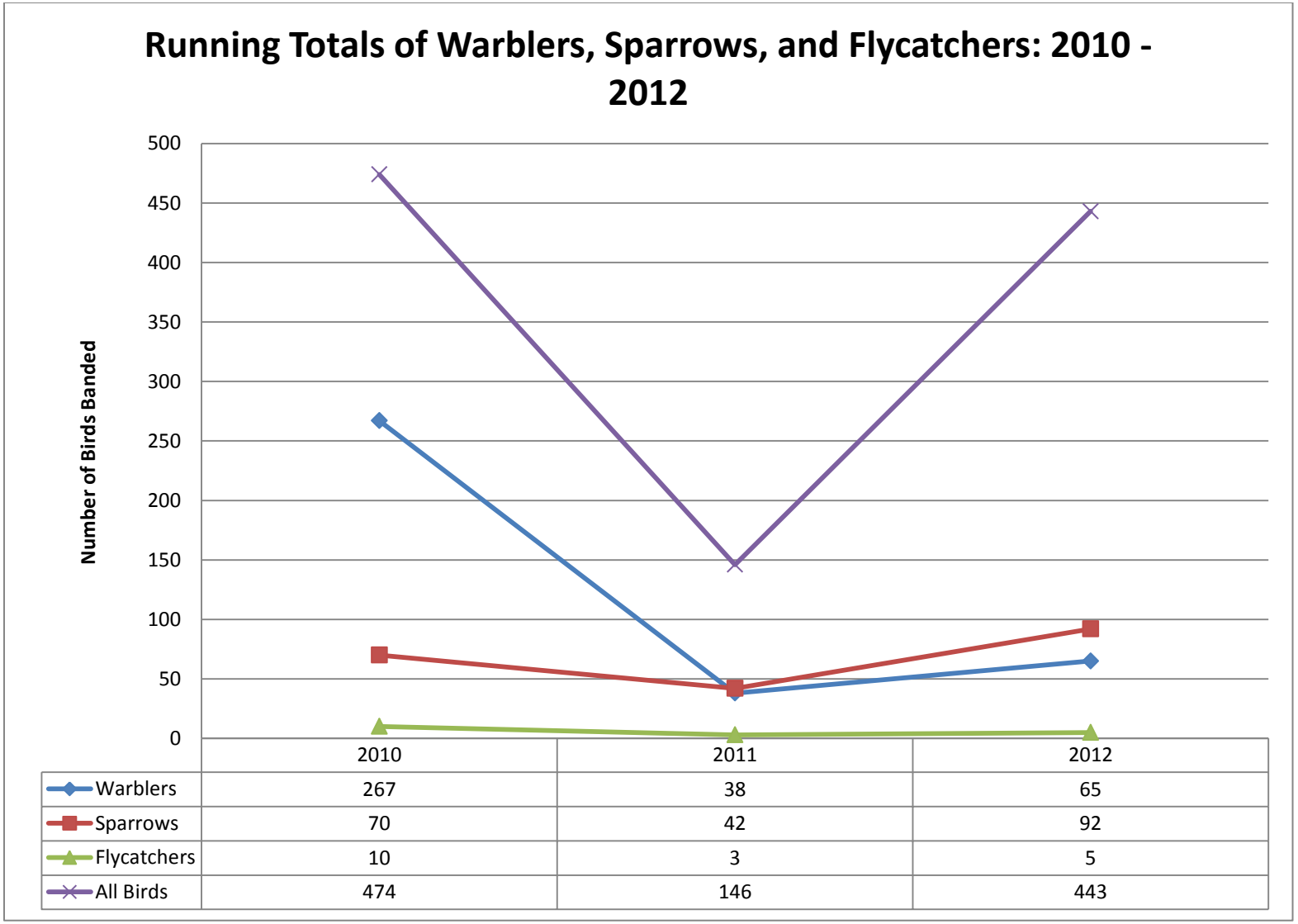

Figure 4. Population trends by bird type from 2010–2012.

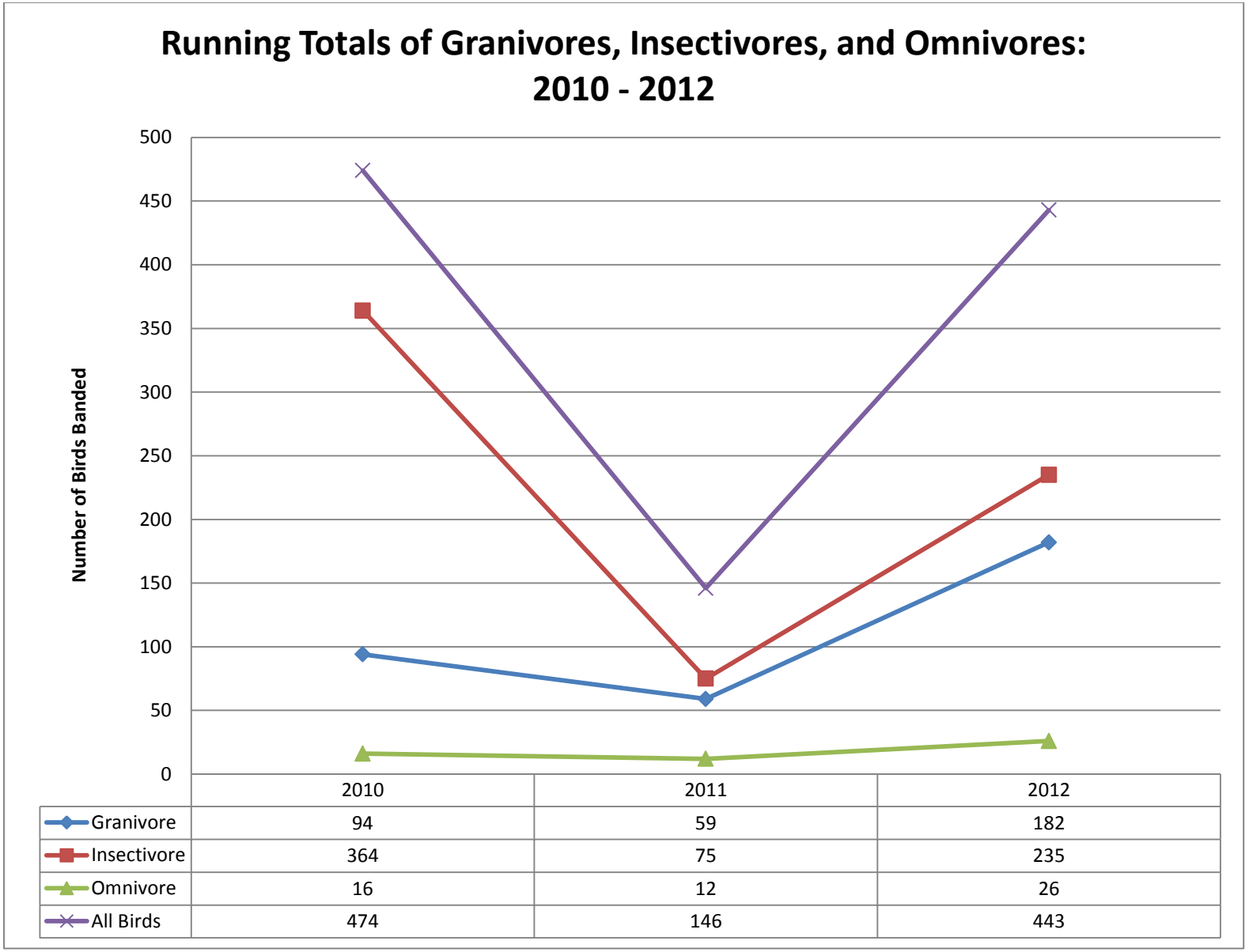

Figure 5. Population trends by diet classification from 2010–2012.

The Palmer Drought Severity Index (PDSI) uses a combination of temperature and precipitation data over several months as indicators of long-term meteorological drought. This index is determined using cumulative values, where negative numbers indicate overall drought stress (low precipitation and high temperature) and positive numbers indicate a lack stress from drought (high precipitation and low temperatures). In New Mexico, the PDSI values based on a four-month average (May to August) for New Mexico in climate division 2 from 2010 to 2012 were -0.48, -5.36, and -6.34 (NOAA 2013). This drought severity would account for a large reduction in insects, which would explain why insectivore species decreased in number more dramatically and did not recover as quickly as granivore species. Plants are also affected by drought. However, it takes a longer time for seed production to be affected by drought compared to the more immediate effect on insects. Insect populations often respond rapidly and dramatically to changes in climatic condition (Rouault 2006). Whether the driver is global or cyclic regional drought, the trend towards hotter, drier summers over the period of record is apparent.

In *Birds and Climate Change: Ecological Disruption in Motion*, the Audubon Society notes a shift in bird populations over the last century (Audubon 2009). Their analysis of annual Christmas Bird Count data reveals both a 35-mile northward trend of birds seen in North America and a positive statistical correlation between annual species location and temperature (Audubon 2009). As temperature increases on a continental scale, both northern latitudes and higher elevations have become warmer, and thus more suitable for species that would have been deterred by cooler temperatures a century ago (Walther et al. 2002). In the case of birds, earlier onset of spring due to warmer temperatures can result in earlier breeding and arrival of migrants (Walther et al. 2002) However, if the increase in temperature is not coupled with an increase in precipitation, traditional sources of food may not be available, causing birds to either leave or not breed in order to conserve energy. The impact on food sources as a result of hotter drier summers could explain a decrease in songbird presence in this study. Long-distance migrants would perhaps be most sensitive to changes in timing of food sources, wherein breeding would be impacted by the lack of seasonal food availability (Both et al. 2009).

Increases in the frequency, duration, and/or severity of drought and heat stress associated with climate change could fundamentally alter the composition, structure and biogeography of forests in many regions (Allen et al. 2010). The Jemez Mountains in particular are considered vulnerable to effects of ongoing climate change (Enquist et al. 2008).

FY13 RECOMMENDATIONS

Continued operation of this fall avian migration monitoring station will have value added to LANL by providing a long-term dataset on ecological health of LANL's biota, contribute to the DOE's obligations under the MBTA and the MOU, and assist in meeting national goals in avian conservation monitoring and research.

LANL is currently engaged in the Natural Resource Damage Assessment (NRDA) process under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The NRDA evaluates to what extent natural resources have been injured as a result of releases of hazardous substances from historical or current work at LANL. An important part of the damage assessment process is analyzing baseline ecological data. The continued operation of fall avian migration monitoring annually will provide important baseline data on avian population levels and habitat use at LANL to the NRDA.

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APPENDIX 1 – MOU BETWEEN DOE AND THE USFWS

MEMORANDUM OF UNDERSTANDING BETWEEN THE UNITED STATES DEPARTMENT OF ENERGY AND THE UNITED STATES FISH AND WILDLIFE SERVICE REGARDING IMPLEMENTATION OF EXECUTIVE ORDER 13186

"Responsibilities of Federal Agencies to Protect Migratory Birds" Prepared by: United States Department of Energy and United States Fish and Wildlife Service

"Responsibilities of Federal Agencies to Protect Migratory Birds"

This Memorandum of Understanding (MOU) is entered into by and between the United States Department of Energy (DOE) and the United States Department of the Interior, Fish and Wildlife Service (FWS), herein collectively referred to as the Parties.

A. Purpose

This MOU meets the requirements under Section 3 of Executive Order 13186, (66 FR 3853, January 17, 2001), concerning the responsibilities of Federal agencies to protect migratory birds. The Executive Order directs executive departments and agencies to take certain actions to protect and conserve migratory birds. The purpose of this MOU is to strengthen migratory bird conservation through enhanced collaboration between DOE and the FWS, in coordination with state, tribal, and local governments. This MOU does not remove the Parties' legal requirements under the Migratory Bird Treaty Act and does not authorize the take of migratory birds. This MOU identifies specific areas in which cooperation between the Parties will substantially contribute to the conservation and management of migratory birds and their habitats.

B. Authority

This MOU is entered under the provisions of the following laws and other authorities available to the Parties:

Migratory Bird Treaty Act (16 U.S.C. §§ 703-711)

Bald and Golden Eagle Protection Acts (16 U.S.C. §§ 668-668d)

Fish and Wildlife Coordination Act (16 U.S.C. §§ 661-666c)

The National Environmental Policy Act of 1969 (42 U.S.C. §§ 4321-4347)

The Endangered Species Act of 1973 (16 U.S.C. §§ 1531-1544)

Executive Order 13186 (66 FR 3853)

C. Missions of Both Parties

DOE

The mission of DOE is to enhance national security through fostering domestic energy production, energy efficiency, and the development of alternative energy sources; ensuring the safety and integrity of the Nation's nuclear weapons; advancing nuclear non-proliferation; cleaning up the environmental legacy of the Cold War and permanently disposing of radioactive waste; and leading in the physical sciences and advancing the biological, environmental, and computational sciences.

FWS

The mission of the FWS is to work with others to conserve, protect, manage, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people.

The FWS Migratory Bird Program serves as a focal point in the United States for policy development and strategic planning, program implementation, and evaluation of actions designed to conserve migratory birds and their habitats.

The FWS is legally mandated to implement the conservation provisions of the Migratory Bird Treaty Act (16 U.S.C. § 703 et seq.), which includes responsibilities for migratory bird population management (*e.g.*, monitoring), habitat protection (*e.g.*, acquisition, enhancement, and modification), international coordination, and regulations development and enforcement.

D. Statement of Mutual Interest and Benefit

DOE manages approximately 2.28 million acres of land, of which a substantial amount is undeveloped and includes wetlands, deserts, and forested mountain areas that provide habitat for a variety of wildlife, including many species of migratory birds. DOE takes its environmental stewardship role seriously and advocates a proactive management stance toward the natural environment. Migratory birds are a part of the natural and man-made environment at many DOE sites, and proper management of migratory birds on DOE lands fosters vigorous and diverse species. DOE recognizes that some of its activities have the potential to impact migratory birds (e.g., transmission lines, power poles, waste treatment settling and evaporation ponds, invasive weeds and various construction activities). To lessen the impacts on migratory birds, whenever appropriate and feasible, DOE sites utilize avian-friendly transmission lines and power poles that are designed to minimize bird collisions and electrocutions; sponsor avian workshops with federal and private entities on minimizing electrocutions and collisions on electric utility structures; monitor waste water retention and evaporation ponds and when necessary utilize netting or noise devices to discourage migratory bird use; utilize invasive weed eradication practices that pose minimal risks to migratory birds; reseed areas with desirable plant species to encourage migratory bird use; monitor construction projects and when feasible schedule construction activities after nesting seasons; have developed habitat management plans for various bird species including bald eagle, Mexican spotted owl, wood stork and southwestern

flycatcher. In addition, DOE routinely utilizes the National Environmental Policy Act (NEPA) process to evaluate the potentially significant environmental impact of proposed actions, including impacts to migratory birds, and to examine alternatives to those actions.

Both Parties have interests and responsibilities in the conservation and management of America's natural heritage and natural resources. The Parties agree that migratory birds are important components of biological diversity; and that their conservation and management will help to sustain ecological integrity, and will serve the growing public demand for outdoor recreation, conservation education, wildlife viewing, and hunting opportunities.

This MOU is necessarily general due to the diversity of programs throughout the DOE site complex.

In consideration of these premises, the Parties agree as follows:

E. Obligations of Both Parties

To the extent allowed by law, subject to the availability of appropriations and within Administration budgetary limits, and in harmony with DOE and FWS missions and capabilities, both Parties shall:

1. Protect, restore, enhance and manage habitats of migratory birds, to the fullest extent practicable. This includes:

a. Implementing management practices that minimize or avoid adverse impact on migratory bird populations, and their nesting, migration, or over-wintering habitats.

b. Working collaboratively with Federal and State agencies to identify, protect, restore, enhance, monitor and manage important migratory bird areas.

c. Preventing or abating the pollution or detrimental alteration of the environment of migratory birds.

2. Promote collaborative inventorying, monitoring, management studies, research, and information exchange related to the conservation of migratory birds and management of their habitats. This includes:

a. Sharing inventory, monitoring, research and study data for breeding, migrating and wintering populations and habitats in a timely fashion with national repositories (such as BBIRD and MAPS), other Federal and State agencies as appropriate, and among DOE offices, as practicable.

b. Collaborating, as practicable, in management studies and research to identify the habitat conditions needed by migratory bird species, to sustain populations of coexisting species and understand the effects of management activities on them.

c. Developing partnerships with other agencies and non-Federal entities to further bird conservation, as practicable.

3. Identify and pursue training opportunities for appropriate employees in methods of monitoring bird populations for the purposes of inventorying, measuring demographic parameters and evaluating the effects of land management activities; and implementing land use practices that promote bird conservation.

4. Provide representation on the Council for the Conservation of Migratory Birds.

5. Periodically evaluate the measures taken under this MOU to protect, restore, and enhance migratory bird resources, including avoiding or minimizing take of migratory birds and, if necessary, suggesting revisions to the FWS to ensure that the most effective conservation measures are employed. These efforts will be coordinated through the FWS's Division of Migratory Birds.

F. Obligations of the DOE

To the extent allowed by law, subject to the availability of appropriations and within Administration budgetary limits, and in harmony with the Department's missions and capabilities, the DOE shall:

1. Integrate migratory bird conservation principles, measures, and practices into agency activities. Avoid or minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions, in compliance with, and supporting the purposes of the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, the Endangered Species Act, NEPA, and other applicable statutes.

2. Protect, restore, enhance, and manage habitats of migratory birds, to the fullest extent practicable. This includes:

a. Reviewing FWS migratory bird lists and/or conducting field surveys to determine which species occur or are likely to occur on DOE properties;

b. Developing habitat management plans to benefit migratory birds and other species consistent with individual DOE site programs;

c. Restoring and enhancing migratory bird and other species' habitat consistent with individual DOE site programs. This may include restoring wetland habitat, controlling invasive species (both plant and animal), reseeding with desirable plant species, etc.; and

d. Preventing and abating the pollution or detrimental alteration of migratory bird habitat by:

i. Properly managing hazardous wastes associated with site activities by containerizing, storing or transporting, or burying wastes in accordance with applicable regulations and guidelines;

ii. Timely remediation of areas that have been contaminated with hazardous materials/wastes;

iii. Using controlled burning to manage invasive weeds; and

iv. Using physical, mechanical and/or herbicidal treatments that pose minimal risks to migratory birds to control invasive weeds.

e. Ensuring that migratory bird protection and conservation is considered in NEPA project reviews by:

i. Identifying and evaluating the effects of proposed projects (actions) on migratory birds;

ii. Minimizing adverse impacts on migratory birds by evaluating all reasonable alternatives of a proposed action; and

iii. Providing reasonable measures within a proposed action to eliminate or minimize adverse effects on migratory bird species. If DOE determines that significant adverse effects to migratory birds cannot be avoided or minimized, the DOE site will notify the FWS prior to the start of the proposed action.

3. Incorporate migratory bird habitat and population management objectives and recommendations into planning processes, including DOE site planning documents, as appropriate, in cooperation with federal, state, and tribal agencies.

4. Promote appropriate programs and recommendations of comprehensive migratory bird planning efforts such as Partners in Flight, United States Shorebird Conservation Plan, North American Waterfowl Management Plan, North American Colonial Waterbird Conservation Plan, and other planning efforts, within established authorities and in conjunction with the adoption, amendment, or revision of agency management plans and guidance.

5. Obtain permits from the applicable FWS Regional Migratory Bird Permit Offices for the take of migratory birds pursuant to requirements of 50 CFR §§ 10, 13, 21, and 22. In doing so, this shall serve as advance notice to the FWS of conducting an action that is likely to result in the take of migratory birds.

6. Identify where take reasonably attributable to DOE actions, other than permitted activities referenced in paragraph 5 above, could affect migratory bird populations or habitats, focusing first on species of concern, their habitats, and key risk factors associated with DOE activities (*e.g.*, installation of power poles and transmission lines, construction projects, invasive weed species eradication and waste treatment which utilizes settling and evaporation ponds).

a. With respect to those actions so identified, and where appropriate and feasible, DOE shall develop and use principles, standards, and practices that lessen the amount of takings. This includes:

i. Utilizing avian-friendly transmission lines and power poles;

ii. Scheduling construction activities around migratory bird nesting seasons;

iii. Utilizing netting covers on waste water retention and evaporation ponds;

iv. Sponsoring avian workshops on minimizing electrocutions and collisions on electric utility structures; and

v. Following the recommendations and suggested practices in wind turbine and powerline guidelines published by FWS and the Avian Power Line Interaction Committee, respectively, to minimize impacts from existing facilities and in the construction of new utility and energy systems and associated infrastructure.

b. DOE shall inventory and monitor bird populations and habitats, as appropriate and feasible, to facilitate decisions about the need for, and effectiveness of, conservation efforts.

7. Recognize and promote the ecological, economic and recreational values of migratory birds into outreach and educational materials and activities.

8. Advise the public of this MOU through a notice published in the *Federal Register*.

G. Obligations of the FWS

Unless otherwise specified, the following activities will be coordinated through the Regional Migratory Bird Program.

To the extent permitted by law and subject to the availability of appropriations and Administration budgetary limits, and to the extent that the following obligations are in harmony with agency missions and capabilities, the FWS shall:

1. Work to identify special migratory bird habitats (*e.g.*, migration corridors, stopover habitats, nesting habitats) under the stewardship of DOE.

2. Improve cooperation and coordination with DOE and other Federal agencies, State agencies, universities, and independent nongovernmental organizations involved in monitoring and research efforts that provide reliable information on the status and trends of migratory bird populations.

3. Provide assistance, at the request of DOE, to identify particular species and habitats that would benefit most from particular agency land management decisions.

4. Initiate new or provide greater support for long-term research and monitoring programs of birds on DOE and adjacent lands.

5. The Division of Migratory Birds shall keep DOE informed of the latest directions in bird conservation that might affect DOE activities, lands, or policies, by providing information on:

a. Changes to the Migratory Bird Treaty Act and its regulations and procedures, or other acts and their regulations affecting migratory birds;

b. Population trends of species that might be affected by activities on DOE lands;

c. Changes to the list of Birds of Conservation Concern;

d. Changes in, updates to or additions to national and regional bird conservation plans (*e.g.*, Partners in Flight bird conservation plans, United States Shorebird Conservation Plan, North American Waterbird Conservation Plan, and the North American Waterfowl Management Plan); and

e. Updated protection measures for reducing human-caused bird mortality as new information becomes available.

6. Encourage widespread use of the best available scientific information in the management of migratory bird populations.

7. Conduct informational and educational programs for DOE oriented toward migratory bird conservation.

H. Termination of MOU; Miscellaneous Provisions

It is mutually agreed and understood that:

This MOU in no way alters or diminishes any Party's obligations or responsibilities under any statute or other legal authority.

1. Either Party may terminate this MOU, in whole or in part, at any time before the date of expiration by providing the other Party 30 day's written notice to that effect.

2. Changes to this MOU shall be made by means of written modification(s) bilaterally executed by the Parties. This instrument in no way alters a Party's obligations to conduct environmental analyses, including compliance with NEPA requirements.

3. This MOU in no way restricts either Party from participating in similar activities with other public or private agencies, governments, organizations, or individuals.

4. Documents furnished to a Party under this MOU may be subject to the Freedom of Information Act (FOIA, 5 U.S.C. § 552). A Party shall not release documents originating in the other Party to a FOIA requester. Rather, the Party shall forward such document(s) to the originating Party for review, determination and response directly to the requester.

5. Modification of this MOU may be made by the issuance of a written amendment(s), signed and dated by all Parties.

6. This is not a binding contract but is an MOU, which broadly states basic understandings between the Parties hereto of the tasks and methods for performing the tasks, described herein. The details of the levels of support to be furnished one organization by the other with respect to funding shall be developed in specific interagency agreements or other agreements, subject to the availability of funds. This MOU shall not be used to obligate or commit funds or as the basis for the transfer of funds. This instrument does not establish authority for noncompetitive award of any contract or other agreement. Any contract or agreement for training or other service must fully comply with all applicable requirements for competition.

7. Any press releases that reference this MOU, or the relationship established between the Parties of this MOU, shall have prior approval of both Parties.

8. Periodic meetings of the Parties shall be scheduled to review progress and identify opportunities for advancing the understandings in this MOU. Collaboration under this MOU shall be in accordance with the applicable statutes and regulations governing the respective Parties.

9. In the event that a dispute arises between the Parties, whether programmatic or procedural, that could have clear, identifiable negative impacts for migratory birds covered by this MOU, the DOE site representative(s) responsible for administering this MOU and their FWS counterpart(s) shall contact DOE's Office of Dispute Resolution and/or FWS's Bureau Dispute Resolution Specialist, who will advise the Parties in determining whether a dispute resolution process, such as convening a mediation with a skilled, experienced mediator, would be appropriate. If resolution can not be reached at the local level, either Party can elevate the issue to the appropriate officials at DOE and FWS Regional offices. In the event that there is no resolution at the Regional levels, the Parties may elect to elevate the dispute to the Washington, D.C. office of each agency.

10. This MOU does not require changes to current contracts, permits, or other third party agreements. The MOU recognizes that DOE may not be able to implement some elements of the MOU until such time as DOE has successfully included them in formal planning processes.

11. This MOU is intended only to improve the internal management of the Executive Branch of the Federal Government and does not create any right or benefit, substantive or procedural, separately enforceable at law or equity by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

12. The principal contacts for this MOU are as follows:

Leroy Banicki Brian Millsap, Chief

Office of Air, Water and Radiation Division of Migratory Bird Management

Protection Policy and Guidance U.S. Fish and Wildlife Service

U.S. Department of Energy U.S. Department of the Interior

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