

LA-UR-12-00488

Approved for public release;
distribution is unlimited.

Title: **Los Alamos National Laboratory Fall Avian
Migration Monitoring Report 2011**

Author(s): Charles D. Hathcock
Beth Norris
Katie Zemlick

Intended for: Public Release



Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by the Los Alamos National Security, LLC for the National Nuclear Security Administration of the U.S. Department of Energy under contract DE-AC52-06NA25396. By acceptance of this article, the publisher recognizes that the U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy. Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness.

Table of Contents

Table of Contents.....	2
Executive Summary.....	3
Introduction	3
Laws and Restrictions.....	3
Permits	4
Site Location.....	5
Methods.....	7
Results.....	8
Discussion.....	11
FY11 Recommendations	14
Acknowledgements.....	14
References	14
Appendix 1 – MOU Between DOE and the USFWS.....	17

Executive Summary

During the fall of 2011, Los Alamos National Security, LLC (LANS) biologists completed the 2nd 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 TA-36 on the north side of Pajarito Road. Captured birds were identified, measured, and banded with a U.S. Fish and Wildlife Service (USFWS) migratory bird band. The 2011 fall migration monitoring effort began on 11 August 2011 and was operated one morning per week until 12 October 2011. A total of ten mist-netting sessions were completed. This project is conducted as part of implementation of the LANS Biological Resources Management Plan 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.

One hundred and forty six birds, representing 31 species, were banded in 2011. Broad-tailed, Black-chinned, Calliope and Rufous Hummingbirds were also captured in August and September but are not analyzed as part of this project. There were substantial declines in songbird diversity and density compared to 2010 at this site. Comparing 2010 to 2011, the total number of birds captured dropped from 474 to 146, a decline of 70 percent. Likewise the total number of species banded dropped from 42 to 31 species. This decline was determined to be regional in scale and likely tied to climatic factors.

Introduction

In 2011, LANS biologists completed the 2nd 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. The 2011 fall migration monitoring began on 11 August and the station's 11 nets were opened once a week until 12 October.

Laws and Restrictions

The Migratory Bird Treaty Act of 1918 (MBTA) is the main legal 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 U.S. and Mexico, the U.S. and Japan, and the U.S. and the Soviet Union (now Russia). For the sake of the MBTA, migratory birds are defined as all native birds in the U.S., except those non-migratory species such as quail and turkey that are managed by individual states.

On August 1, 2006, an MOU was finalized between the USFWS and DOE/NNSA regarding the implementation of the Migratory Bird Treaty Act at DOE facilities (Appendix 1). Under the MOU, subject to the availability of appropriations and in harmony with DOE/National Nuclear Security Administration (NNSA) missions and capabilities, DOE/NNSA agreed to several actions, including:

- 1. Integrate migratory bird conservation principles, measures, and practices into agency activities, and avoid or minimize, to the extent practicable, adverse impacts on migratory bird resources.*

2. *Protect, restore, enhance, and manage habitats of migratory birds to the fullest extent practicable, including (a) reviewing migratory bird lists and/or conducting field surveys to determine which species are likely to occur, (b) developing habitat management plans to benefit migratory birds and other species consistent with individual site programs, (c) preventing and abating the pollution or detrimental alteration of migratory bird habitat, and (d) ensuring that migratory bird protection is considered in NEPA project reviews and notifying USFWS if significant adverse impacts cannot be avoided or minimized before the start of an action.*

3. *Incorporate migratory bird habitat and population management objectives and recommendations into planning processes.*

4. *Promote appropriate programs and recommendations of comprehensive migratory bird planning efforts such as Partners In Flight (PIF).*

5. *Obtain permits from the applicable USFWS Regional Migratory Bird Permit Offices for the take of migratory birds as required by law.*

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)...*

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.*

The section of the MOU bolded above, section 6 b, highlights the contribution of this fall migration monitoring effort to LANL planning and environmental protection objectives. The *Migratory Bird Best Management Practices Source Document for Los Alamos National Laboratory, Revised November 2011* (LANL 2011), is an institutional management document that addresses how LANL will mitigate impacts to migratory birds. The plan 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 each year and report results to the NM Department of Game and Fish as well.

Site Location

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



Figure 1. Photograph of the wetlands where the banding site is located, looking east

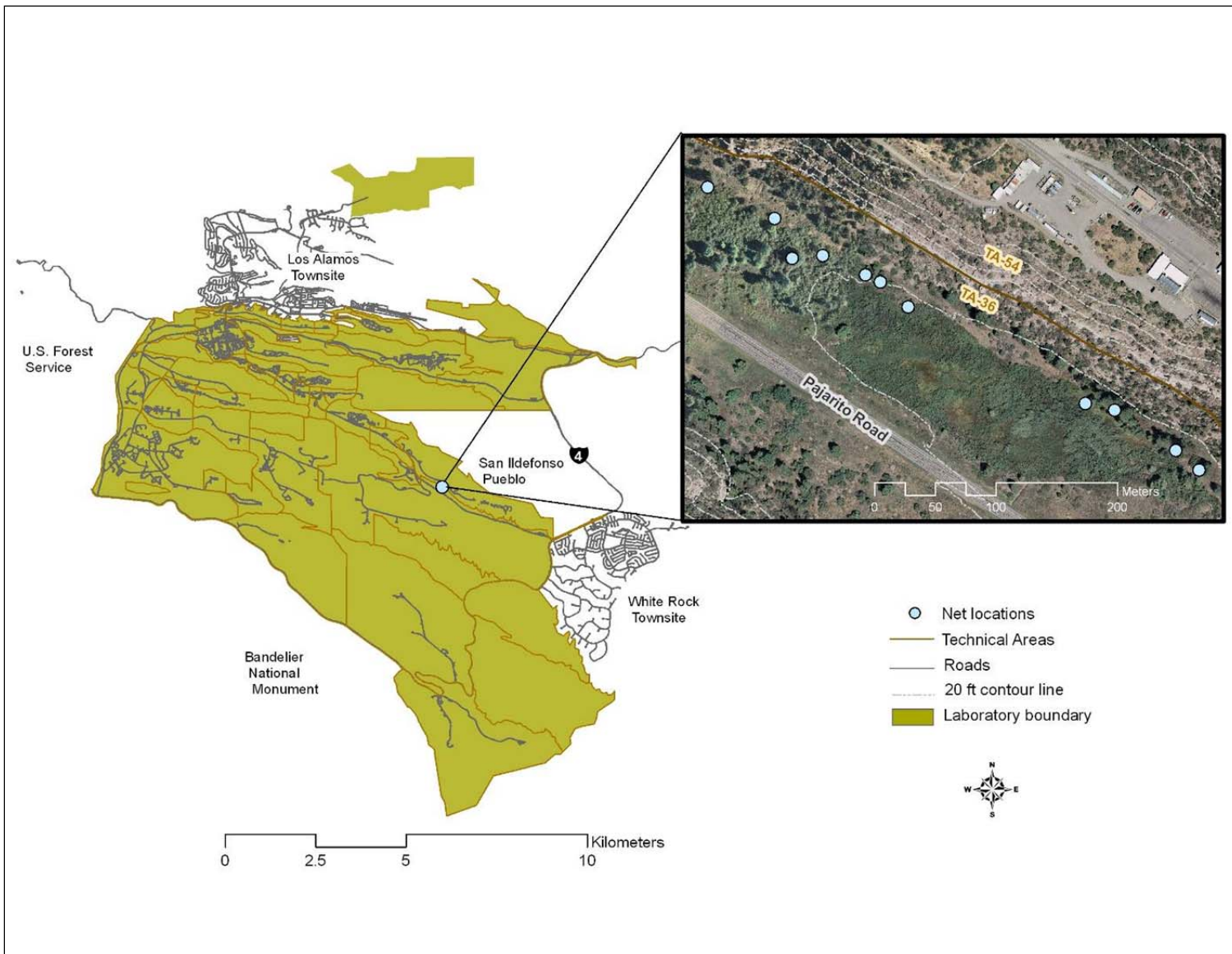


Figure 2. Location of the fall migration monitoring banding site at LANL

Methods

The banding station used eleven 12m long mist-nets with 30mm 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 the 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 have been open. One net that is open for one hour is 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 birds per net hour for the entire project was also calculated.

Abundance values for the top ten 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).

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.

Results

Banding operations took place on ten mornings between August and October 2011. The dates were August 11, 17, 24, September 1, 7, 14, 21, 28, October 7, and 12 2011. The nets were opened before sunrise and closed between noon and 1pm. The total net hours for this year's fall migration monitoring project were 592 net hours. A total of 146 birds, representing 31 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 0.26. Table 1 details the numbers of species and when they were captured. The top five species in total number banded were Lesser Goldfinch, White-crowned Sparrow, Bushtit, Wilson's Warbler, and Virginia's Warbler. Table 2 lists the top ten species for 2011, their abundance in birds per 100 net hours, percent of total birds captured, percent aged as hatch-year, arrival date, departure date, and for comparison the number of that species banded in 2010.

The percentage of birds that are hatch-year (young) birds during migration is important to examine because it will provides estimates of annual nesting success. Kelley and Finch's (2000) work showed that sample variation of sex ratios resulting from the sampling methodology does go down as the number of days of effort increases. This project was only ten days of effort and because of that, inferences on age ratios are not as robust and thus have a higher amount of variation. Year-to year comparisons can still be made when more data are available. The overall percentage of hatch-year birds for the site was 56 percent. This is similar to 2010 where the overall percentage of hatch-year was 57 percent.

The total percentage of birds captured with fat scores greater than 1 (on a scale of 0 – 5) was 41 percent for the site overall, with many of the migratory species having large fat deposits. This was similar to 2010 which was 38 percent, both years data on fat scores being 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 sex birds have diminished and plumage characteristics in hatch-year birds are often not distinctive to determine sex.

The migration peaked the second week of September with 22 birds being banded on September 7th. The site peaked again with 35 birds on October 7th, but the majority of these birds were species known to over-winter in Los Alamos such as the White-crowned Sparrow. Some migrants like the Orange-crowned Warbler were still present.

Table 1. Summary of Birds Banded in 2011

	Species / Date Banded										Total
	8/11/11	8/17/11	8/24/11	9/1/11	9/7/11	9/14/11	9/21/11	9/28/11	10/7/11	10/12/11	
American Robin						1	1				2
Audubon's Warbler									4	1	5
Bewick's Wren						1			1		2
Blue-gray Gnatcatcher				1							1
Brewer's Sparrow			1								1
Bushtit			5	3			1			3	12
Canyon Towhee			1								1
Chipping Sparrow		1	1		6			1			9
Dusky Flycatcher				1	2						3
Gray-headed Junco								1	1		2
House Finch									2		2
House Wren							1				1
Lesser Goldfinch			1		1			3	8	7	20
Lincoln's Sparrow							1	2	1	2	6
MacGillivray's Warbler					3						3
Mountain Chickadee	1	1						1			3
Orange-crowned Warbler					1			2	5		8
Oregon Junco									1		1
Pygmy Nuthatch					2						2
Red-Naped Sapsucker						1			1		2
Red-shafted Flicker					1				1		2
Ruby-crowned Kinglet									3	1	4
Song Sparrow									1		1
Spotted Towhee			1	1						1	3
Townsend's Solitaire				1							1
Virginia's Warbler	4	1	3	1		1					10
Western Wood-Pewee	2					1					3
White-crowned Sparrow								2	6	10	18

Williamson's Sapsucker	1	2	1	1		1					6
Wilson's Warbler					6	2	3				11
Yellow Warbler			1								1
Grand Total	8	5	15	9	22	8	7	12	35	25	146

Table 2. Top Ten Species in Total Number Captured in 2011

Bird Name	2011 Number banded	Abundance in birds per 100 net hours	Percent of Total Birds Captured	Percent Hatch Year	Arrival Date	Departure Date	2010 Number banded
Lesser Goldfinch	20	4.21	13.70	45.0	24-Aug	Ongoing ²	23
White-crowned Sparrow	18	9.76	12.33	66.6	28-Sept	Ongoing ²	33
Bushtit	12	2.53	8.22	33.3	Year-round ³	Year-round ³	0
Wilson's Warbler	11	6.73	7.53	63.6	7-Sept	21-Sept	32
Virginia's Warbler	10	2.84	6.85	100	11-Aug	14-Sept	58
Chipping Sparrow	9	2.21	6.16	66.6	Seen Prior ¹	28-Sept	4
Orange-crowned Warbler	8	2.78	5.48	62.5	7-Sept	7-Aug	44
Williamson's Sapsucker	6	1.71	4.11	100	11-Aug	14-Sept	4
Lincoln's Sparrow	6	2.49	4.11	100	21-Sept	Ongoing ²	14
Audubon's Warbler	5	4.03	3.42	100	7-Oct	Ongoing ²	119

¹Seen Prior: Observed at this site prior to first capture date; ²Ongoing: Observed at this site after the project completion; ³Year-round: Known to occur at this site year-round.

Discussion

All 146 birds captured during this project are protected under the MBTA. Additionally, several species seen at the banding site are considered Birds of Conservation Concern from region 16, the Southern Rockies/Colorado Plateau region (USFWS 2008) including the Pinyon Jay, 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. Two bird species captured during this project are in the top 100 list, the Rufous Hummingbird and Virginia's Warbler, and several others are frequently seen in this wetlands complex.

The overall bird captures were significantly down from 2010. From 2010 to 2011, there was a 70 percent decline in bird numbers banded at the site, the birds per net hour dropped from 0.88 to 0.26, there was a drop in the number of species banded from 42 to 31, and the hardest hit group was the warblers, which saw dramatic declines (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 granivore, where a bird's food strategy is primarily eating seeds; insectivore, where their strategy is primarily eating insects; and omnivore, where the diet was split evenly between the two. After grouping birds into these classifications, it was apparent that insectivores had a tough year compared to granivores (Figure 5).

The first question we had to answer was whether these declines were localized or larger in scale. There are similar fall migration monitoring stations in northern NM. At nearby Bandelier National Monument, there are two long-term fall sites. Their 2011 overall capture rate was down 65.2 percent from 2010 and down 204.2 percent from the 2008-2010 mean average (Stephen Fettig, Personal Communication). At Sandia National Laboratory (SNL) in Albuquerque, NM they have experienced similar declines in 2011. At SNL, fall migration monitoring results for 2011 showed declines of greater than 50 percent from 2010 (Steve Cox, Personal Communication). It is clear that changes in bird populations were occurring in 2011 on a regional scale.

Warblers from 2010 to 2011

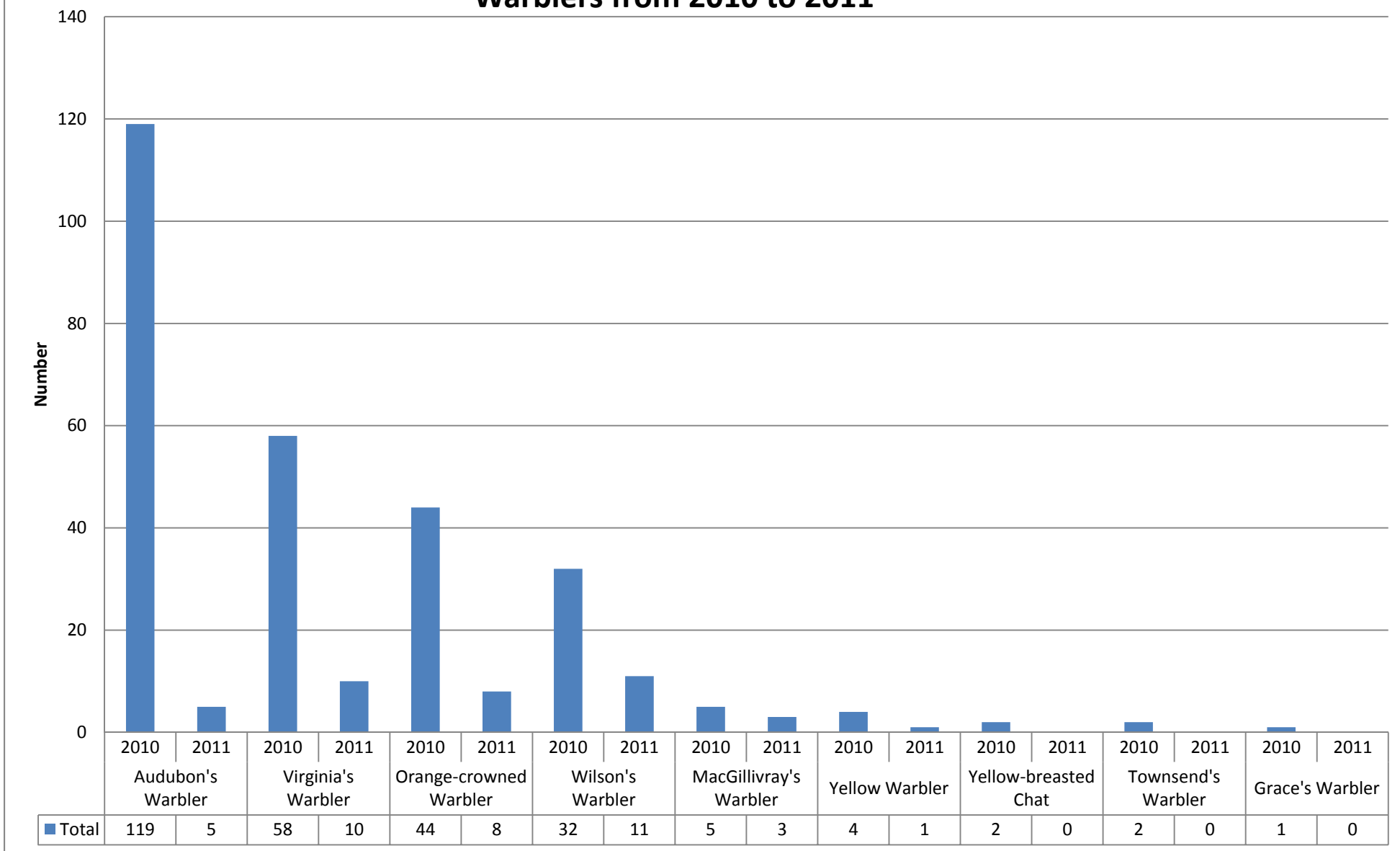


Figure 4. Warbler declines from 2010 to 2011 at the Pajarito fall migration-monitoring station.

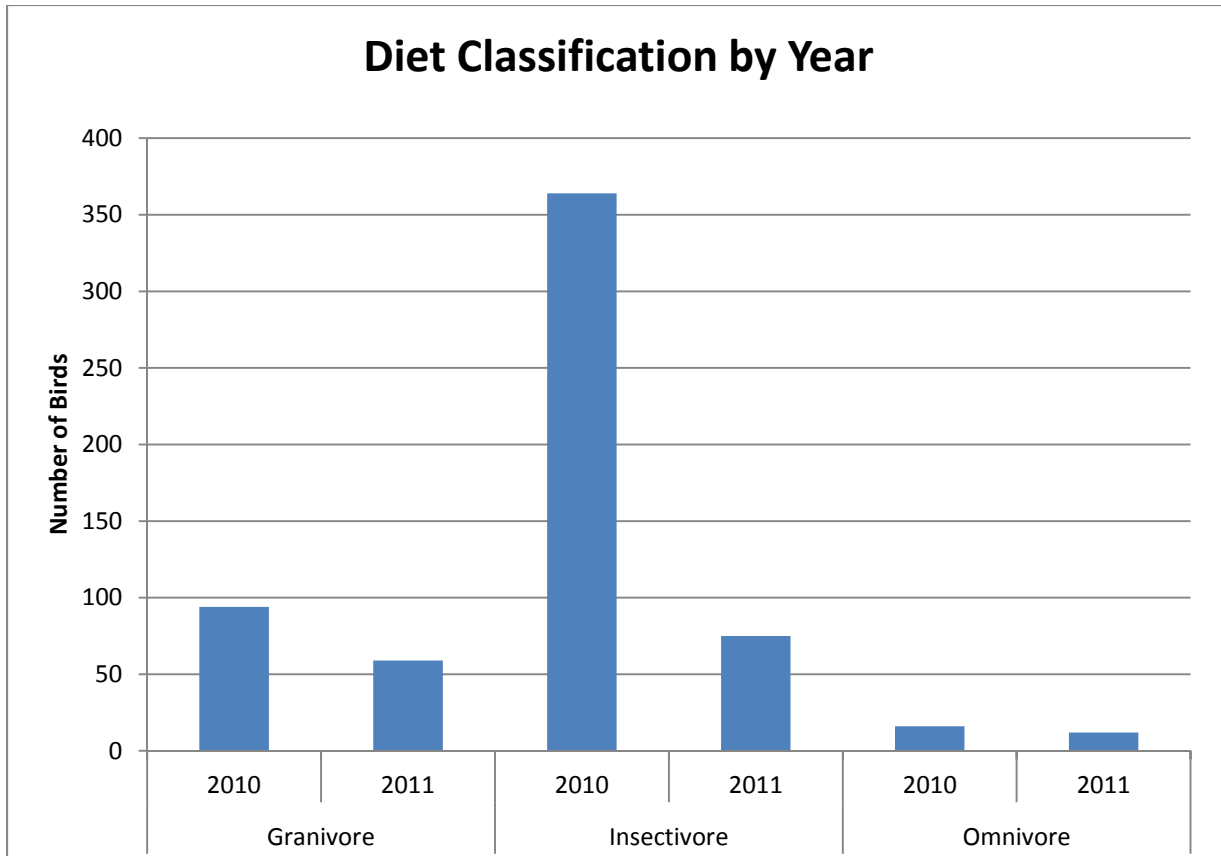


Figure 5. Comparisons of 2010 to 2011 of birds grouped into diet classifications.

These regional changes in bird populations are likely due to ongoing drought stressors in the southwestern United States. 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, May to August 2011 had a PDSI value of -4.98, second only to the 1904 record of -5.23 in the entire period of recording beginning in 1895 (NOAA 2012). The drought severity would account for a large reduction in insects which would explain why the insectivores were hit harder than seed eaters. Plants are also affected by the drought, but it takes a longer time to affect seed production compared to the more immediate effect on insect densities. Insect populations can often respond rapidly and dramatically to changes in climatic condition (Rouault 2006). Whether the driver is global or previously observed 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 precipitation, traditional sources of food may not be available and birds may either leave or not breed in order to conserve energy. The impact on food sources as a result of hotter drier summers could, in turn, explain a decrease in songbird presence in this study. Long-distance migrants will 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).

FY11 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. The NRDA will evaluate 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.

Acknowledgements

We'd like to thank Hallie Mahowald, Leslie Hansen, and Jen Nisengard for comments on earlier versions of this report; and the following people for field help during this project: Jeanne Fair, Steve Fettig, Lyndi Hubbell, David Keller, Bruce Panowski, and Brian Jones.

References

Allen, C.D., A.K. Macalady, H. Chenchouni, D. Bachelet, N. McDowell, M. Vennetier, T. Kizberger, A. Rigling, D.D. Breshears, E.H. Hogg, P. Gonzalez, R. Fensham, Z. Zhang, J. Castro, N. Demidova, J.H. Lim, G. Allard, S.W. Running, A. Semerci, and N. Cobb. 2010. A global overview of drought and heat-induced tree mortality reveals emerging climate change risks for forests. *Forest Ecology and Management* 259(4): 660-684.

Audubon Society. 2009. *Birds and Climate Change: Ecological Disruption in Motion*. New York: National Audubon Society.

The Birds of North America Online (BNA). 2012. <http://bna.birds.cornell.edu/bna/> Last accessed January 2012.

Both, C., C.A.M. Van Turnhout, R.G. Bijlsma, H. Siepel, A.J. Van Strien, and R.P.B. Foppen. 2010. Avian population consequences of climate change are most severe for long-distance migrants in seasonal habitats. *Proceedings of the Royal Society of London* 277:1259-1266.

Browning, M.R. 1993. Comments on the taxonomy of *Empidonax traillii* (Willow Flycatcher). *Western Birds* 24:241-257.

Bub, Hans. 1996. *Bird Trapping and Bird Banding: A Handbook for Trapping Methods All over the World*. Cornell University Press, Ithaca, NY.

Enquist, C.A.F., E.H. Girvetz, and D.F. Gori. 2008. A Climate Change Vulnerability Assessment for Biodiversity in New Mexico, Part II: Conservation Implications of Emerging Moisture Stress due to Recent Climate Changes in New Mexico. The Nature Conservancy.

Gustafson, M. E., J. Hildenbrand and L. Metras. 1997. *The North American Bird Banding Manual (Electronic Version)*. Version 1.0

Kelley, J.F. and D.M. Finch. 2000. Effects of Sampling Design on Age Ratios of Migrants Captured at Stopover Sites. *The Condor* 102:699-702.

Los Alamos National Laboratory (LANL). 2011. *Migratory Bird Best Management Practices Source Document for Los Alamos National Laboratory*, Revised November 201. LA-UR-11-0629. Los Alamos National Laboratory, Los Alamos, NM.

National Oceanic and Atmospheric Administration (NOAA). 2012. National Environmental Satellite, Data, and Information Service (NESDIS). Retrieved January 10th 2012, from NOAA/National Climatic Data Center: <http://www.ncdc.noaa.gov/temp-and-precip/time-series/index.php>.

Pyle, P. 1997. *Identification guide to North American passerines*. Volume 1. Slate Creek Press, Bolinas California.

Rouault, G., J. Candau, F. Lieutier, L. Nageleisen, J. Martin, and N. Warzee. 2006. Effects of Drought and Heat on Forest Insect Populations in Relation to the 2003 Drought in Western Europe. *Annals of Forest Science* 63:613-624.

U.S. Fish and Wildlife Service (USFWS). 1995. Final rule determining endangered status for the Southwestern Willow Flycatcher. *Federal Register* 60(38):10694. 43 pp.

U.S. Fish and Wildlife Service (USFWS). 2008. *Birds of Conservation Concern 2008*. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. [Online version available at <<http://www.fws.gov/migratorybirds/>>]

Walther G., E. Post, P. Convey, A. Menzel, C. Parmesan, T.J.C. Beebee, J.M. Fromentin, O. Hoegh-Guldberg, and F. Bairlein. 2002. Ecological responses to recent climate change. *Nature* 416:389-395.

Well, J.V. 2007. *Birder's Conservation Handbook: 100 North American Birds At Risk*. Princeton University Press. Princeton, New Jersey. 452 pp.

Woodward, J.C. and P.W. Woodward. 1977. Keeping Banding Records: Writing Fall Reports. *North American Bander* 2(3):99-103.

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

Room 3G-089 4401 N. Fairfax Drive,

1000 Independence Ave., SW MS 4107

Washington, D.C. 20585 Arlington, VA 22203