LA-UR-10-07491
Approved for public release; distribution is unlimited.

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

Author(s): Charles D. Hathcock

Intended for: Public Release

Table of Contents

Table of Contents 2
Executive Summary 3
Introduction 4
Laws and Restrictions 4
Why Band Birds? 5
Permits 6
Site Location 7
Methods 9
Results 10
Discussion 14
FY11 Recommendations 14
Acknowledgements 15
References 15
Appendix 1 – MOU Between DOE and the USFWS 16
Appendix 2 – Selected Fall Bird Photos 23

Executive Summary

During 2010, Los Alamos National Laboratory (LANL) biologists completed a monitoring effort to document fall migration patterns of passerines (songbirds) at LANL. A mist-netting station was established in wetland/riparian habitat at LANL. Birds were captured and banded with U.S. Fish and Wildlife Service migratory bird bands. The 2010 fall migration-monitoring began on 04 August and the station's 11 nets were opened once a week until 07 October. Monitoring did not continue through October, because the majority of the wintering species had arrived by 07 October.

Four hundred and seventy-two birds, representing 42 species, were banded as part of this effort (Table 1). Broad-tailed, black-chinned, and rufous hummingbirds were also routinely captured in August and released without being banded. The number of birds banded per net hour for the entire season was 0.84. The ecological importance of LANL's wetlands complex is supported by the results of this study. A large diversity of birds use this area, including willow flycatchers, a subspecies of which is federally endangered. There are many risk factors that may affect these wetlands in the future, including possible development, so understanding the role that LANL lands play in bird migration is important for developing strategies for biological resources protection and management.

Introduction

During 2010, Los Alamos National Laboratory (LANL) biologists completed a monitoring effort to document fall migration patterns of passerines (songbirds) at LANL. A mist-netting station was established in wetland/riparian habitat at LANL. Birds were captured and banded with U.S. Fish and Wildlife Service migratory bird bands. The 2010 fall migration-monitoring began on 04 August and the station's 11 nets were opened once a week until 07 October. Monitoring did not continue through October, because the majority of the wintering species had arrived by 07 October.

Laws and Restrictions

The Migratory Bird Treaty Act of 1918 (MBTA) is the main 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, a Memorandum of Understanding (MOU) was finalized between the U.S. Fish and Wildlife Service (USFWS) and the Department of Energy (DOE) 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 the DOE/National Nuclear Security Administration (NNSA) missions and capabilities, the DOE 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, Revision 1* (LANL 2010), 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 migratory bird populations at LANL.

Why Band Birds?

Bird banding data are useful in both research and management of migratory birds. Individual identification of birds makes possible studies of dispersal and migration, behavior and social structure, life-span and survival rate, reproductive success and population growth. Every bird bander participates in studies of dispersal and migration by sending all their banding data in to the Federal Bird Banding Laboratory and many banders also submit their data to the Institute for Bird Populations. When banded birds are captured, released alive and reported from somewhere else, biologists can reconstruct the movements of the individual bird. In this way we have learned that some species go south in one flyway and return north by another flyway. Flyways are divided by region into the Atlantic, Mississippi, Central, and Pacific flyways; however, the actual way the flyways look is more of a scatter plot (Figure 1). Nesting and wintering grounds have been located for some species, and specific nesting grounds have been connected to specific wintering areas. LANL biologists report their banding data to the Federal Bird Banding Laboratory each year and report results to the New Mexico Department of Game and Fish as well.

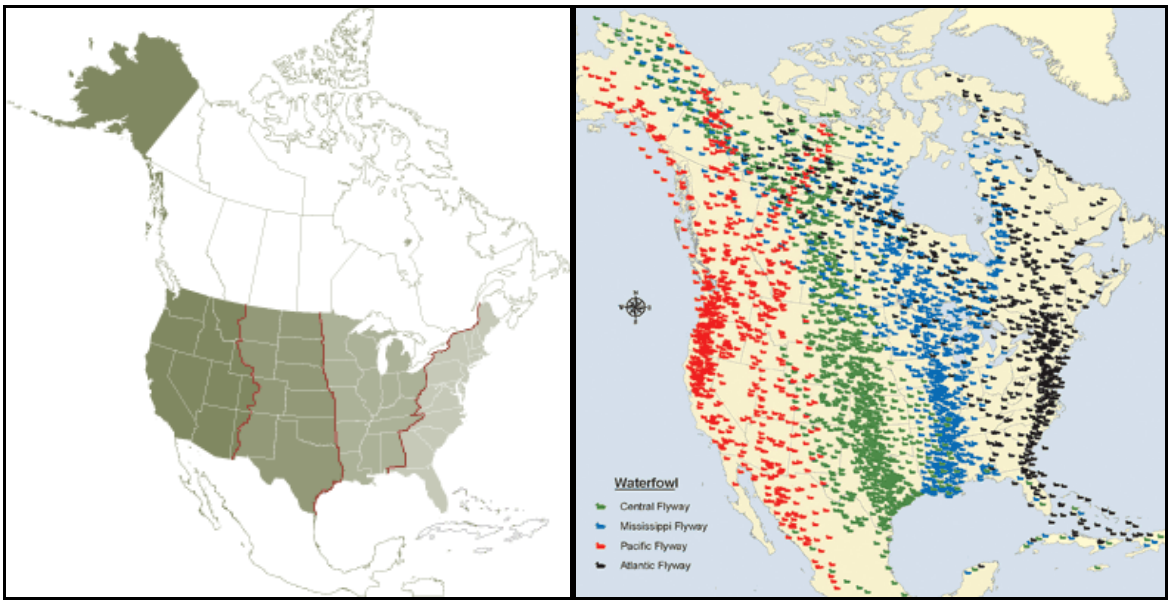

Figure 1. (left) Administrative migratory bird flyways (right) Biological migratory bird flyways

Banding and marking birds can be used to estimate the numbers of birds in a population using mark-recapture techniques. Banding data allows for the comparison of normal, wild banded birds with birds that may have had their survival altered by exposure to contaminants or other hazards. Survival and productivity can be studied by using a constant effort banding site such as the Monitoring Avian Productivity and Survivorship (MAPS) program. It is a cooperative research effort of the Institute for Bird Populations and banders throughout North America. In addition to this fall migration-monitoring effort, LANL biologists also manage a MAPS station at Technical Area 15 to meet requirements in the DARHT Mitigation Action Plan. This work and other bird monitoring projects support the MOU with the USFWS.

Sampling wild birds for disease helps determine the prevalence of the disease in the population. Banding allows for birds that have been sampled once to be avoided in the next sample--or to be resampled, depending on the study. Several birds captured at this fall migration-monitoring site had blood samples collected for use in the avian influenza project directed by Dr. Jeanne Fair of B-Division at LANL.

Permits

The principal investigator has a master banding permit from the Federal Bird Banding Laboratory in Maryland (permit number 23440); a federal permit from the US Fish and Wildlife Service that covers incidental banding of migrant willow flycatcher (permit number TE082492-0); a state permit from the NM Department of Game and Fish authorizing birds to be banded in NM (permit number 3327); and an approved Institutional Animal Care and Use Committee protocol at LANL to ensure compliance with the Animal Welfare Act (permit number 06-114).

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

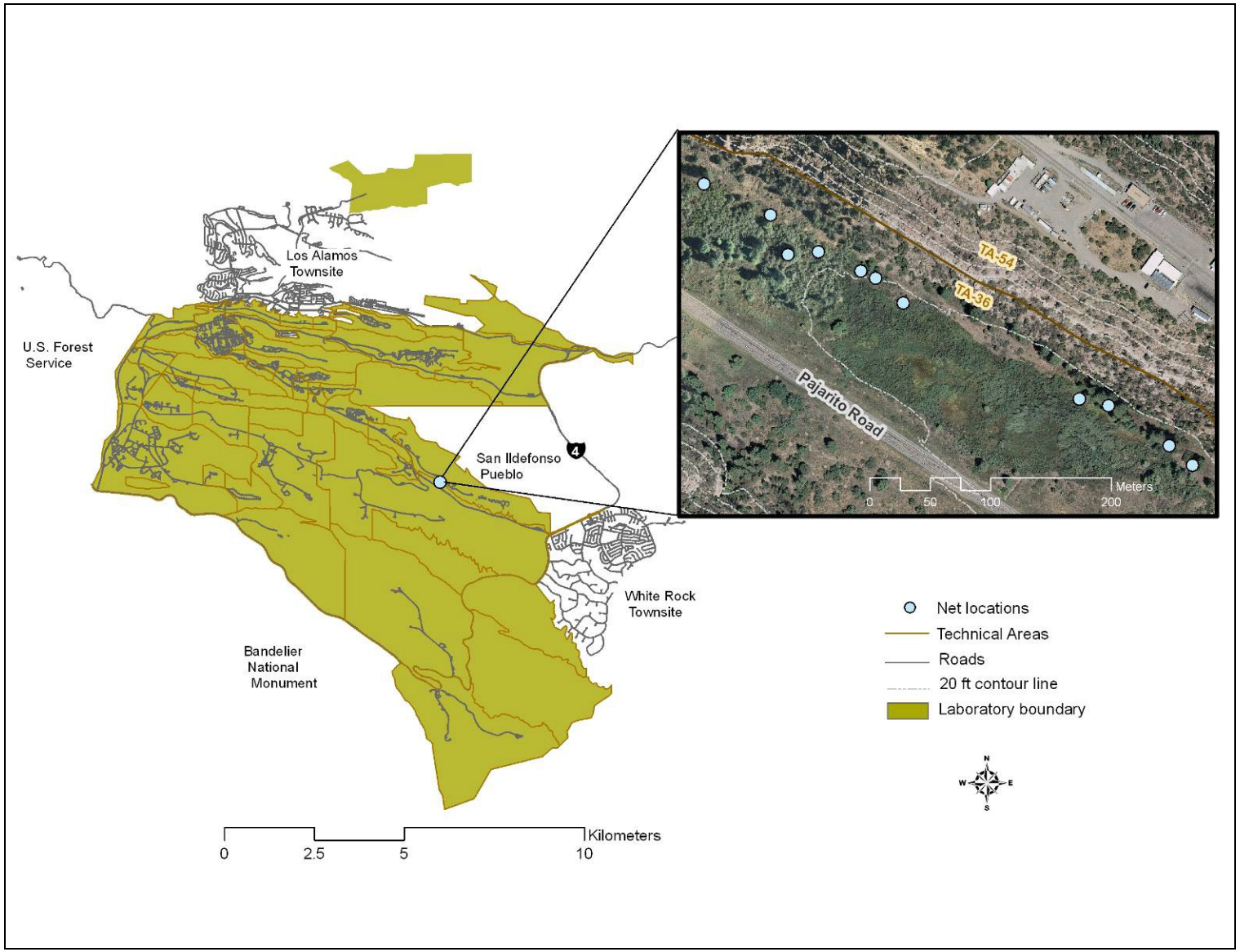

Figure 3. Location of the fall migration-monitoring banding site at LANL

Methods

The banding station used eleven 12m long mist-nets with 30mm mesh (Figure 4). Net locations were placed strategically to maximize the number of birds captured. Methods for net placement are available in Bub (1996). A standard U.S. Fish and Wildlife Service 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 ageing and sexing criteria were based on Pyle (1997). The time that the nets were opened and closed and the weather conditions at opening and closing was also recorded. Of primary importance was the safety and welfare of the personnel and the birds.

Figure 4. An open mist-net

Bird captures were summarized by date and grouped by family. 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 twelve 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).

$$\text{Abundance} = \frac{\text{Total number of net hours for the period of occurrence of a selected species}}{\text{Total number of individuals for the selected species, including returns, but nor repeats}}$$

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 eleven mornings between August and October. The dates were August 4th, 11th, 18th, 26th, September 1st, 8th, 22nd, 24th, 29th, and October 7th 2010. The nets were opened around 20 minutes before sunrise each day and closed between 11:30am and 12:30pm. The morning of September 22nd was cut short due to inclement weather. The total net hours for this fall migration project were 565.25 net hours. A total of 472 birds, representing 42 species, were banded. Broad-tailed, black-chinned, and rufous hummingbirds were also routinely captured in August and released without being banded. The number of birds banded per net hour for the whole project was 0.84. Table 1 details the numbers of species and when they were captured with the species grouped by family. The top five species in total number banded were Audubon's Warbler, Virginia's Warbler, Orange-crowned Warbler, Ruby-crowned Kinglet, and White-crowned Sparrow. Table 2 lists the top twelve species, their abundance in birds per 100 net hours, percent of total birds captured, percent aged as hatch-year, percent with large fat deposits, arrival date, and departure date.

The percentage of birds that are hatch-year (young) birds during migration is also important to examine. 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 eleven 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 percentage of hatch-year birds was greater than 50% in most of the top twelve birds captured.

The total percentage of birds captured with fat scores greater than 1 (on a scale of 0 – 5) was 38% for the site overall, with many of the migratory species having large fat deposits. This is indicative of birds in transit. The most abundant bird in the project, the Audubon's warbler, had lower fat scores with nearly 70% of the Audubon's warblers being lean when captured. The low fat content could be why these birds are using this area as a stopover point, replenishing their energy stores for continued migration south. Many Audubon's warblers breed in Canada and Alaska and have a long migration pathway.

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 99 birds being banded on September 14th. More birds would have been banded on this day, but the nets were closed early due to a lack of field help to adequately process the large number of birds safely. The site peaked again with 88 birds on the last day, October 7th, but the majority of these birds were species known to over-winter in Los Alamos such as the White-crowned sparrow. LANL's Pajarito wetlands complex is obviously important to bird populations year-round.

Species Taxonomic Number	Species Code	Common Name	4-Aug-10	11-Aug-10	18-Aug-10	26-Aug-10	1-Sep-10	8-Sep-10	14-Sep-10	22-Sep-10	24-Sep-10	29-Sep-10	7-Oct-10	Total	Percent of Total Capture to Date
Woodpeckers															
393.0	HAWO	Hairy Woodpecker							1			2		3	0.64%
394.0	DOWO	Downy Woodpecker							1					1	0.21%
402.1	RNSA	Red-naped Sapsucker				1						1		2	0.42%
404.0	WISA	Williamson's Sapsucker	1	1			1		1					4	0.85%
413.0	RSFL	Red-shafted Flicker						1	2					3	0.64%
Flycatchers															
459.0	OSFL	Olive-sided Flycatcher						1						1	0.21%
462.0	WEWP	Western Wood-Pewee	3	2					1					6	1.27%
464.0	COFL	Cordilleran Flycatcher	1											1	0.21%
466.0	WIFL	Willow Flycatcher				1			1					2	0.42%
469.0	DUFL	Dusky Flycatcher				1			3	1	1			6	1.27%
Jays															
481.0	WESJ	Western Scrub-Jay							1	1				2	0.42%
Finches															
530.0	LEGO	Lesser Goldfinch		2	3	1	2		2	1		3	9	23	4.87%
533.0	PISI	Pine Siskin				2	1					1	3	7	1.48%
Emberizids (Sparrows and sparrow-like birds)															
554.0	WCSP	White-crowned Sparrow								1	1	7	23	32	6.78%
560.0	CHSP	Chipping Sparrow		2			1					1		4	0.85%
567.1	ORJU	Oregon Junco											1	1	0.21%
569.0	GHJU	Gray-headed Junco										1		1	0.21%
583.0	LISP	Lincoln's Sparrow							3	2		4	5	14	2.97%
588.0	SPTO	Spotted Towhee	2		1				1		1	2		7	1.48%
590.0	GTTO	Green-tailed Towhee			1		1		2			1	1	6	1.27%
591.0	CANT	Canyon Towhee					1		1	2				4	0.85%
596.0	BHGR	Black-headed Grosbeak		1										1	0.21%
597.0	BLGR	Blue Grosbeak		3	2	2								7	1.48%
598.0	INBU	Indigo Bunting				1								1	0.21%
Tanagers															
609.0	HETA	Hepatic Tanager							1					1	0.21%
Wood Warblers															
644.0	VIWA	Virginia's Warbler	7	7	16	12	7	5	4					58	12.29%
646.0	OCWA	Orange-crowned Warbler					1	3	25	6	4	2	3	44	9.32%
652.0	YWAR	Yellow Warbler			1	2		1						4	0.85%
656.0	AUWA	Audubon's Warbler			1	2		1	31	18	39	19	8	119	25.21%
664.0	GRWA	Grace's Warbler	1											1	0.21%
668.0	TOWA	Townsend's Warbler							2					2	0.42%
680.0	MGWA	MacGillivray's Warbler						1	1	1		1		4	0.85%
683.0	YBCH	Yellow-breasted Chat			1				1					2	0.42%
685.0	WIWA	Wilson's Warbler			3	5	1	7	12		1	3		32	6.78%
Wrens															
719.0	BEWR	Bewick's Wren		1									3	4	0.85%
721.0	HOWR	House Wren	1	1	1	1	1						1	6	1.27%
Nuthatches															
727.0	WBNU	White-breasted Nuthatch			1									1	0.21%
Chickadees															
738.0	MOCH	Mountain Chickadee						1				3	4	8	1.69%
Kinglets															
749.0	RCKI	Ruby-crowned Kinglet							1	1	4	7	27	40	8.47%
Thrushes															
754.0	TOSO	Townsend's Solitaire										1		1	0.21%
759.0	HETH	Hermit Thrush	1	1					1	1				4	0.85%
761.0	AMRO	American Robin		1		1								2	0.42%
Total birds banded			**17**	**22**	**31**	**32**	**17**	**21**	**99**	**35**	**51**	**59**	**88**	**472**	
Total birds recaptured			**0**	**4**	**3**	**3**	**1**	**1**	**3**	**0**	**2**	**2**	**5**	**24**	
Total net hours (11 Nets)			47.50	50.25	54.00	54.25	54.00	51.25	39.25	44.00	60.75	55.00	55.00	565.25	
Total birds banded per net hour			0.36	0.52	0.63	0.65	0.33	0.43	2.60	0.80	0.87	1.11	1.69	0.88	

Table 1. Summary table

Bird Name	Number banded	Abundance in birds per 100 net hours	Percent of Total Birds Captured	Percent Hatch Year	Percent with Large Fat Deposits	Arrival Date	Departure Date
Audubon's Warbler	119	25.45	25.21%	63.03%	33.61%	Seen Prior[1]	Ongoing[2]
Virginia's Warbler	58	16.55	12.29%	58.62%	29.31%	Seen Prior	14-Sep
Orange-crowned Warbler	44	12.25	9.32%	79.55%	59.09%	1-Sep	Ongoing
Ruby-crowned Kinglet	40	15.75	8.47%	37.50%	75.00%	14-Sep	Ongoing
White-crowned Sparrow	32	14.90	6.78%	81.25%	53.13%	22-Sep	Ongoing
Wilson's Warbler	32	7.76	6.78%	62.50%	43.75%	18-Aug	29-Sep
Lesser Goldfinch	23	4.44	4.87%	17.39%	30.43%	Year-round[3]	Year-round
Lincoln's Sparrow	14	5.51	2.97%	42.86%	28.57%	14-Sep	Ongoing
Mountain Chickadee	8	2.62	1.69%	75.00%	50.00%	Year-round	Year-round
Blue Grosbeak	7	4.42	1.48%	28.57%	0.00%	Seen Prior	26-Aug
Pine Siskin	7	1.69	1.48%	0.00%	0.00%	Year-round	Year-round
Spotted Towhee	7	1.37	1.48%	57.14%	14.29%	Year-round	Year-round

Table 2. Top twelve species in total number captured

[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.

Discussion

Two willow flycatchers were captured and banded on 26 Aug and 14 Sept. There are five recognized subspecies of the Willow Flycatcher, each of which has a distinct breeding range (USFWS 1995 and Browning 1993). Three of these five could occur at LANL during migration, including the federally endangered subspecies, the southwestern willow flycatcher. The subspecies of the two migrant willow flycatchers banded during this project is not certain. During spring surveys, migrant willow flycatchers have been detected at this site in the past. In addition to possibly supporting federally protected species like the southwestern willow flycatcher, LANL lands are important for understanding migratory bird conservation in general. All 472 birds captured during this project are protected under the migratory bird treaty act. Additionally, two of the bird species that were captured in this project, the willow flycatcher and the Grace's warbler, are considered Birds of Conservation Concern from region 16, the Southern Rockies/Colorado Plateau region (USFWS 2008). 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. Four bird species captured during this project are in the top 100 list, the rufous hummingbird, olive-sided flycatcher, Virginia's warbler, and Grace's warbler.

This was the first year of this effort at the Pajarito wetlands at LANL and comparisons to past years are not available. Comparing this site to the nearby fall migration-monitoring sites at Bandelier National Monument and Camp May (S. Fettig, Personal Communication), the number of birds per net hour was significantly higher at the LANL site. The reasons why are unclear.

Continued operation of this fall avian migration-monitoring station will benefit 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 conservation monitoring and research.

FY11 Recommendations

Implementation of the MOU on migratory birds through continued bird banding, to monitor fall migration of songbirds at LANL, will provide data that can be tracked annually. This provides information on the ecological health of LANL, and also contributes to the national goals of migratory bird management.

LANL is beginning the Natural Resource Damage Assessment process under the Comprehensive Environmental Response, Compensation, and Liability Act. This damage assessment 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 tool in the damage assessment process is analyzing baseline ecological data and the continued operation of this project annually will provide baseline monitoring data on avian population levels and habitat use at LANL.

Acknowledgements

I'd like to thank Leslie Hansen, Jen Nisengard, and David Keller for comments on earlier versions of this report; Marjorie Wright for GIS support; David Janecky for an OPSEC review; and the following people for field help during this project: Leslie Hansen, Lyndi Hubbell, David Keller, Lauren Measatas, Bruce Panowski, Rhonda Robinson, and Sonja Salzman.

References

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.

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). 2010. Migratory Bird Best Management Practices Source Document for Los Alamos National Laboratory, Revision 1. LA-UR-07-8434. Los Alamos National Laboratory, Los Alamos, NM.

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

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/>]

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

Appendix 2 – Selected Fall Bird Photos

Olive-sided flycatcher

Willow flycatcher

Male Blue grosbeak

Female Blue grosbeak

Lincoln’s sparrow

Gray-headed junco

Male red-shafted flicker

Female red-naped sapsucker

Downy woodpecker

Hairy woodpecker

Male Williamson’s sapsucker

Female MacGillivray's warbler

Yellow-breasted chat

Orange-crowned warbler

Virginia's warbler

Townsend's warbler

Female Audubon's warbler

Grace's warbler

Yellow warbler

Mountain chickadee

Ruby-crowned kinglet

Male hepatic tanager