

**Fish Springs National Wildlife Refuge
Dugway, Utah**

**Annual Narrative Report
2013**

INTRODUCTION

This Annual Narrative Report covers 2013 Refuge activities not reported in the 2013 Annual Habitat Work Plan (AHWP), 2013 Water Management Plan (2013 Water Use and 2014 Water Use Plan), and the 2013 Water Delivery System Annual Maintenance Plan and Completion Report. The latter two reports are included as appendices in the AHWP. Introductory descriptions of the Refuge have been provided in past Annual Narrative Reports. A detailed and updated introductory description of the Refuge can also be obtained in the newly developed Habitat Management Plan (currently in draft).



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A. 2013 HIGHLIGHTS

May – Robert Sims, Administrative Assistant, retires

May – Bryan Smith, Maintenance Worker, takes on new hybrid role to perform the station’s Generalist duties

March – Regional safety team reviews the Station’s safety program

Spring – “Invasives for Volunteers” grant funds awarded

Spring/Summer – Invasive plant explosion (pepperweed and knapweed) controlled

Spring/Summer – A waterfowl nesting production study was conducted

Spring/Summer – Nest predator and coyote scat surveys were continued

Spring/Summer – Cooperated with UDWR to conduct dove banding as part of USFWS national plan

Summer – NVCS field mapping and field accuracy assessment was fully completed

Summer – Major maintenance to water delivery system (Mallard Unit)

Summer - Major maintenance to impoundment system (Walter Marsh and Shoveler Unit)

Summer – Post-treatment *Phragmites* mapped in Curlew, Egret and Ibis Units

Fall – *Phragmites* control continued in Shoveler, Pintail and Mallard Units

Fall – New entrance kiosk interpretive panels completed and delivered

Fall – Chevy Tahoe replaced with F-150 crew cab pickup truck

November – Wildlife Biologist Tiffany Cummins is promoted to GS-11

B. CLIMATIC CONDITIONS

The climate of Fish Springs NWR is arid. The average annual precipitation is 8 inches, with most precipitation falling in the spring and fall. Wide temperature fluctuations typical of desert environments occur daily and seasonally. Temperatures can range from 109 degrees Fahrenheit in summer to minus 19 degrees Fahrenheit in winter. High moisture losses during the summer occur through evapotranspiration as a result of low humidity and high ambient temperatures. Dry thunderstorms are common during the summer. Winter temperatures can remain well below freezing for several days at a time with snowfall averaging 15 inches per year. The frost-free season generally runs from late-April through mid-October. Wind speeds are generally light to moderate.

Depending on the accuracy of current assessments, climate change is a growing concern. The Great Basin is already experiencing changes in temperature and precipitation. Over the last 100 years, average temperatures have risen 0.6 to 1.1°F. Since the middle of the last century, there has been a 6 to 16 percent increase in annual precipitation coupled with increases in seasonal variability in which it falls. A decline in the April snowpack in the Great Basin has been observed since 1950 and the early spring snowmelt that feeds the areas intermittent streams has been observed 10 to 15 days earlier than in the mid-1900s (Chambers et al. 2008).

Historically, weather data has been collected by Refuge staff for the NOAA weather station located just east of the Refuge office, and this data has been reported in past Annual Narrative Reports. A second MesoWest weather station is located just beyond the northeast corner of the Refuge's impoundment system in the Gadwall Unit. This station has automated data collection and it is maintained by staff at Dugway Proving Ground. The following table provides 2013 weather data for the two stations.

Weather Comparisons - Calendar Year 2013 (01/01/2013-12/31/2013)								
Month	NOAA Weather Station				MesoWest Weather Station			
	High Temp	Low Temp	Precip. Type	Precip. (in)	High Temp	Low Temp	Precip. Type	Precip. (in)
January	20.6	-0.6		0.25	19.7	-0.6		0.44
February	31.7	12.2		0.38	33.6	11.6		0.30
March	56.3	32.3		0.02	56.2	32.2		0.06
April	62.8	36.7		1.59	63.3	38.1		1.53
May	75.0	47.3		0.88	75.0	47.4		0.78
June	91.5	61.3		0.00	89.7	59.4		0.00
July	97.3	68.2		0.53	96.5	67.4		0.09
August	94.2	66.3	Rain	0.35	92.9	64.3		0.34
September	78.5	55.0	Rain	1.80	78.7	53.8		0.49
October	63.1	36.1		0.23	62.7	34.6		0.18
November	50.1	28.3	Rain/Snow	0.17	52.9	26.6		0.14
December	31.5	5.9	Snow	0.29	28.5	5.4		0.34
Annual	62.7	37.4		6.49	62.5	36.7		4.69

D. PLANNING

1. Master Plan (Comprehensive Conservation Plan, 2004)

The Fish Springs CCP guides Refuge operations, habitat and water management, visitor services, and partnering over a 15-year period by providing goals and objectives, implementation strategies, and recommended staffing and funding for the Refuge. The CCP was written with relatively broad guidance for habitat management and it directed the development of a Habitat Management Plan (HMP, see step-down plans below).

2. Management Plans (Step-down)

The step-down HMP is currently under development and a detailed description of that effort is provided in the combined Annual Narrative Report for years 2010-12. A finalized draft version is expected to be completed by the end of 2014.

4. Compliance with Environmental and Cultural Resource Mandates

See the the combined Annual Narrative Report for years 2010-12 for a more detailed account on compliance needs. Documentation of compliance for Refuge activities in 2013 can be found in the Refuge's main files.

5. Research and Investigations

In the latter half of September, Sarah Yakimowski of the Reiseburg Lab, Department of Botany, University of British Columbia, collected tissue samples from wild sunflower plants across the Refuge under a Special Use Permit. This area was of particular interest because the species is generally known to be “moderately salt tolerant,” and yet preliminary observations of populations in this area suggest these populations may experience high salinity. The Reiseburg Lab wanted to test whether these populations are locally adapted to high saline conditions by conducting comparative analyses of the genetic composition of the potentially highly tolerant populations to non-saline populations collected elsewhere. Tissue samples of approximately 30 plants as well as soil samples were taken.

In August, the Army Corps of Engineers, Cold Regions Research and Engineering Laboratory in Hanover, New Hampshire was issued a Special Use Permit and began field study on the Refuge in 2013. The visiting team is focused on wetland research in support of the Corp's Wetland Regulatory Assistance Program.

Project Proposal

Title: Developing a procedure to sort out wetland ratings for halophytes on the National Wetland Plant List using *Allenrolfea occidentalis* a case study.

Problem: During the National Wetland Plant List's Federal Register Comment period, the public expressed concern over the ratings of wetlands plants that exhibit a strong response to more than one environmental gradient. Specifically, commenters felt that indicator status ratings of salt tolerant plants, or halophytes, were too wet (Wenger

2011). Other commenters submitted halophyte occurrence data, collected at small spatial scales, in wetlands and uplands (Lokovic 2011). These data suggested that many species with OBL or FACW wetland ratings (almost always occur in wetlands) should actually be rated FAC or even FACU (usually occur in nonwetlands but may occur in wetlands) (Lichvar et al. 2012). This discrepancy stems from the fact that wetland ratings categorize plants based on their response to one important environmental gradient: moisture. However, most plants exhibit a strong response to more than one environmental gradient. For example, halophytes are able to tolerate high soil salinity, prolonged inundation, and drought.

Objective: to develop a procedure for the NWPL to deal with different groups of problematic wetland plants and to resolve their indicator status ratings.

In 2011, a multi-partner project involving graduate study of snowy plover was initiated on neighboring Dugway Proving Ground (DPG) and the Refuge. Financial support was provided primarily from The Department of Army, DPG, and project work was contracted by DPG with Brigham Young University (BYU). Other support was provided by the Refuge, which included housing and vehicle use. A study was designed to identify snowy plover site occupancy on DPG and Refuge lands. A model was developed for use on DPG and direct counts were performed on the Refuge. Full project partner involvement included DPG, BYU, the Refuge, UDWR, BLM, John Cavitt of Weber State, and Suzanne Fellows of the USFWS R6 Migratory Bird Program. Results of that study can be found in 2011 and 2012 study reports by Kristen Ellis and the Annual Habitat Work Plan/Report (2010-12). A thesis report by Ellis was completed in late 2013 and the Refuge should be receiving a copy soon.

In 2013, partner discussions were initiated concerning the continuation of graduate study on snowy plover at DPG and the Refuge that were focused on learning about SNPL movements both locally and regionally. These discussions lead to pilot field work conducted by Kristen Ellis involving the testing of transmitters on SNPL, as well as her acceptance by BYU into a PhD program to continue the subject field study. She will officially begin her dissertation fieldwork in 2014. The following photographs are of her pilot fieldwork in 2013.



Kristen Ellis of BYU fitting a transmitter to a SNPL.



Refuge staff assisting the mist net capture of SNPL.



Mounted transmitter on hatch year SNPL.

E. ADMINISTRATION

1. Personnel



2013 Permanent and Seasonal Staff

Back row

1

2

3

4

5

6

Front row

7

8 9

10

11

12

2013 Personnel

1. Bryan Smith Maintenance Worker, Career-Seasonal, GS-4749-08
2. Rodney Wright Maintenance Worker, Career-Fulltime, GS-4749-08
3. John Bourne Biological Science Technician, Temporary, GS-0404-05
4. Brian Allen Wildlife Refuge Manager, GS-0485-12
5. Nick Jenson FWS Biological Volunteer
6. Mackenzie Brown FWS Biological Volunteer
7. Carly Russell BYU Contracted Biological Technician
8. Elizabeth Tray FWS Biological Volunteer
9. Widgie Resident duck dog trainee
10. Julie Long Biological Science Technician, Temporary, GS-0404-05
11. Sprig Resident duck dog
12. Tiffany Cummings Wildlife Biologist, GS-486-11 (promoted 11/2013)

Not photographed:

- Robert Sims Administrative Assistant, GS-0303-07 (retired 5/2013)
Melissa Smith BYU Contracted Biological Technician

Changes in permanent staff in 2013 included the promotion of wildlife biologist Tiffany Cummins in November from GS-09 to GS-11, and the retirement of Robert Sims in May after nine years at Fish Springs NWR as the administrative assistant.

Temporary staff supporting 2013 biological field work included two FWS biological technicians and three FWS volunteers, and a BYU contracted biological technician (C. Russell). In addition, a BYU contracted biological technician (M. Smith) worked remotely in early 2013 (after the 2012 field season) by assisting with historic bird data summarization and analyses.

John Bourne returned to work as a biological technician at Fish Springs from the previous year when he worked both as a biological science technician and a biological volunteer. Julie Long who worked a short period at the Refuge in 2012 as a biological volunteer also returned to work as a biological technician. Biological volunteers Elizabeth Tray, Nick Jenson, and Mackenzie Brown came to Fish Springs from North Carolina, Minnesota, and Virginia, respectively. A full account of biological program volunteering activities, including those of Elizabeth, Nick, and Mackenzie are described in the following section (4. Volunteer Program).

4. Volunteer Program

Part-time volunteering was continued during 2013 by Raven Retsteitter, PhD, who is employed as a science advisor for the chemical program at DPG. Raven continued collecting monthly water quality monitoring data for the Refuge and provided instruction and learning to volunteers and interns who assisted him. In addition, Raven conducted stem density surveys in support of the newly established control program for *Phragmites*. This is an ongoing effort with future results and reporting forthcoming.

In support of habitat management and biological inventory and monitoring, we recruited three non-paid interns to work at the Refuge during the summer of 2013. We required a commitment to working a 40 hour/week schedule for at least 12 weeks during the summer field season. In return from the Refuge, the students received housing free of charge, food cost reimbursement, personal work supplies and all personal protective gear, and a wealth of varied biological field experiences. In addition, they received training and/or certifications in safety and environmental compliance, ATV/UTV operation, ArcGIS/RLGIS use, plant and bird identification, and pesticide use and application. A “Volunteers for Invasives” grant for \$4,000 was received in 2013 to support an increased volunteer effort in an expanded and updated program for invasive weed management using RLGIS. In addition, volunteer field work included assistance with NVCS vegetation mapping, avian monitoring, targeted species surveys, water flow and quality monitoring, waterfowl nesting production study, nest predator inventory, and involvement in a graduate pilot field project on snowy plover. Interns also assisted with a nation-wide dove banding project (as led in UT through the UDWR), and they volunteered one day every 2-3 weeks for wildlife biologists of the Department of Army, Dugway Proving Ground (DPG). The latter project assistance was done as part of our ongoing cooperative efforts with DPG and provided the interns even more field work experiences, such as herpetological pit fall trapping, photo trap monitoring, and the capture and handling of raptors and bats.



Fish Springs Refuge volunteer assisting herpetology field study of DPG Biologist

Fish Springs NWR Volunteers and Project Activities



2013 Biological Volunteers



Nest Monitoring



NVCS Vegetation Mapping



Pest Plant Control



Snowy Plover Graduate Research Assistance



Waterfowl Nest Production Study



Remote Monitoring Camera Installation

5. Funding

In 2013, our station's total available budget including the government quarters account was \$437,265. This included a 5% reduction in base funding of \$19,854 as a result of sequestration, due to a national budget not being reconciled and passed by Congress. There was also an \$11,560 reduction from the total budget, due to a fiscal year carry over payment into the PCS pool during the vacancy period of the vice-Dolgoff (assistant refuge manager) position beginning in fy2012. The normal Business Team allocation for our station's budget was also adjusted downward, due to the retirement of R. Sims who performed Travel Specialty and Generalist administrative duties as part of the Business Team. Also factored in the total available budget was an increase of \$4,000 as awarded through a "Volunteers for Invasives" grant. Work performed in 2013 by the BYU biological technicians was done under an existing contract with BYU, as funded through an Inventory & Monitoring Program (I&M) grant award in 2011.

By May, all Travel Specialty duties were moved offsite to a new location and person/s within the Business Team and our station's Generalist duties were reassigned to Bryan Smith, the station's career-seasonal Maintenance Worker. To cover salary costs of Bryan's new hybrid position duties in fy2014 and beyond, the Mountain Zone's Business Team Leader requested from the Regional Office that we receive flex funding of \$28,300 for Generalist support below the line at Fish Springs. Later, this funding request for all similar positions within the Zone was changed to a new recommendation by the Refuge Supervisor for being established above the line (permanently added to station budgets). Bryan's position was also to be changed from 0.5 FTE to 0.95 FTE and his furlough period reduced from approximately half of a year to one pay period.

6. Safety

In 2013, the Station's safety program continued to be led by the refuge manager who served as the collateral duty safety officer. Region 6 places strong emphasis on safety compliance and Fish Springs has done much over the last 4-year period to upgrade the station's safety program. A more detailed account can be found in the 2010-12 combined Annual Narrative Report. In 2013, the Region's Safety Team, Jim Chandler (Chief) and Jim Behrman visited our station to conduct a 3-year safety program review. Few and only minor findings were identified and we received praise for our program's compliance and continued development. All 8 findings were abated and reported as such within 30 days.



ATV Safety Training Certification

7. Technical Assistance

In 2013, the need for technical assistance by Sean Fields (biologist and GIS specialist of the R6 HAPET program) and Jo Ann Dullum (R6 I&M GIS manager) was greatly reduced due to the GIS skills and knowledge held by our station's newly established wildlife biologist, Tiffany Cummins. Sean and Jo Ann continued to provide limited support as needed.

Jeff Warren, Mountain Zone I&M Biologist, continued with full support in our HMP development process, as well as support with other biological program needs.

Chris Crocket aquatics biologist with Utah Division of Wildlife Resources (UDWR) continued to advise our least chub repatriation planning efforts.

Tiffany Cummins, our station's wildlife biologist, provided technical support to UDWR's Wildlife Action Plan (WAP) revision through participation as a WAP main committee member and habitat sub-committee member. Tiffany also led a leg banding and data collection effort for doves at the Refuge on behalf of UDWR as part of the USFWS national plan.

Brian Allen, wildlife refuge manager, participated as a member of UDWR's Watershed Restoration Initiative.



Biological Science Technician, Julie Long leg banding a mourning dove

8. Training/Miscellaneous

See the Annual Work Plan on file.

9. Other

NTR.

F. HABITAT MANAGEMENT

1. General

See 2013 Annual Habitat Work Plan/Report.

2. Wetlands

See 2013 Annual Habitat Work Plan/Report.



American White Pelican

5. Grasslands (all uplands)

See 2013 Annual Habitat Work Plan/Report.

9. Fire Management

Fish Springs NWR falls within the Rocky Basin Fire Management District of R6 and Tracy Swenson is the district's Fire Management Officer (FMO). Tracy operates from Bear River Migratory Bird Refuge and has one new subordinate staff member. Beginning in 2012, updated Fire Management Plans were required in R6 before any prescribed fires could be conducted (per an ARD directive). In 2013, the FMO and his assistant began developing the station's Fire Management Plan. In this effort, they requested various types of information, GIS products, and editing support from Fish Springs staff, which was provided. The plan was completed and sent to the Regional Office for review and signature. We are hopeful to have this plan fully approved and able to conduct prescription burns again by March 2014.

10. Pest Control

See the 2013 Annual Habitat Work Plan/Report and the Pesticide Use Proposal (PUP) database.



Perennial Pepperweed Control



11. Water Rights

8-51, 5 cfs, North Spring, priority 4/16/1926;
18-59, 10 cfs, Lower Fish Springs, priority 4/30/1929;
18-66, 10 cfs, Spring Area, priority 12/27/1930;
18-215, 18.88 cfs Springs (11), priority 5/22/1961;
18-331, 0.1 cfs, Underground Water Well, priority 10/08/1970;
United States of America Federal Public Water Reserve No. 1, Spring Area, priority 1912.

See the 2013 Annual Water Management Plan for water monitoring and management reporting.

13. Easement Monitoring

The WPA easement near Delta, UT was visited once in 2013.

G. WILDLIFE

1. Wildlife Diversity

See the 2013 Annual Habitat Work Plan/Report.

2. Endangered and/or Threatened Species

See the 2013 Annual Habitat Work Plan/Report.

3. Waterfowl

See the 2013 Annual Habitat Work Plan/Report.



4. Marsh and Waterbirds

See the 2013 Annual Habitat Work Plan/Report.

5. Shorebirds, Gulls, Terns and Allied Species

See the 2013 Annual Habitat Work Plan/Report.



Nesting Long-billed Curlew – Harrison Unit

6. Raptors

See the 2013 Annual Habitat Work Plan/Report.

7. Other Migratory Birds

See the 2013 Annual Habitat Work Plan/Report.

9. Mammals

See the 2013 Annual Habitat Work Plan/Report.



10. Other Resident Wildlife

See 2013 the Annual Habitat Work Plan/Report.

11. Fisheries Resources

See 2013 the Annual Habitat Work Plan/Report.

14. Scientific Collections

NTR.

15. Animal Control

A coyote scat survey (as a population index) was conducted, and nest predation monitoring was conducted using remote cameras. For more in depth reporting, see the 2013 AHWP.

16. Marking and Banding

In 2013, wildlife biologist Tiffany Cummins banded doves on the Refuge on behalf of UDWR as part of the USFWS national plan. See ‘Technical Support’, above and the 2013 AHWP.

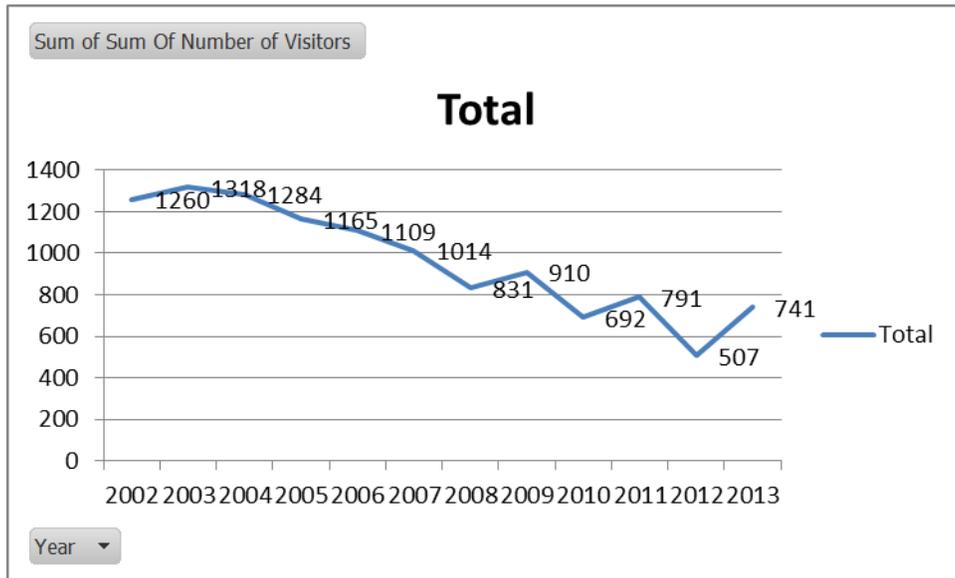
17. Disease Prevention and Control

NTR.

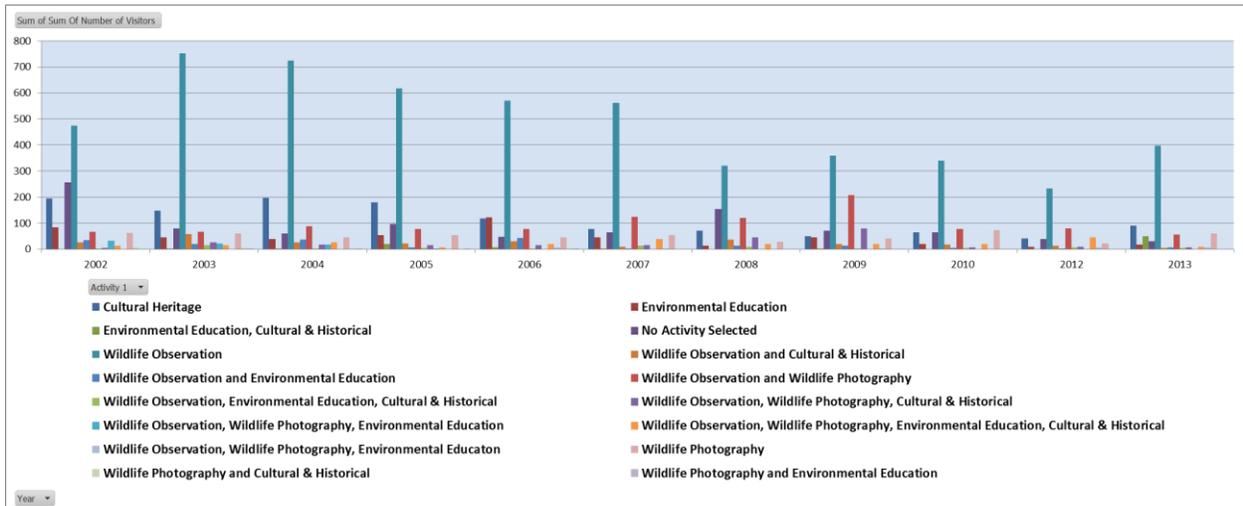
H. PUBLIC USE

1. General

In spite of its isolation, the Refuge has hosted as many as 2,000 to 3,000 visitors each year. Of the Big-6 priority public uses, the Refuge's allowed activities include waterfowl hunting, wildlife observation, wildlife photography, environmental education and interpretation. For the last several years, total use has been declining. In 2013, total visits were increased over the preceding year. The following two figures provide total and comparative visitor use over the last 12 years, including several types of use categories minus hunting. The total number of recorded visitors in 2013 including hunting was 1,402. Hunting is reported below in section H.8.



Total visitor use per year minus hunting visits, 2002-2013.



Visitor use by category and year (does not include hunting visits), 2002-2013

5. Interpretive Tour Routes

The interpretive auto tour route was sprayed and graded twice in 2013. All interpretive panels along the route are getting aged and should be considered for replacement. Their wooded supporting structures are in poor condition and at a minimum should be replaced. One of the interpretive panels along the route was removed due to maintenance work on a water control structure. Additionally, the route's directional signs are in need of replacement in the near future.

6. Interpretive Exhibits/Demonstrations

In 2013, the refuge manager and Shannon Heath, R6 Division of Education and Visitors Services, worked with an awarded contractor, Formations of Portland OR, to develop new interpretive panels for the Refuge's entry kiosk. The panels were completed and delivered to the Refuge before the years end. Plans are to remodel the kiosk in 2014, including re-staining, brochure box replacement, and installation of the new panels.

7. Other Interpretive Programs

One guided field tour was provided for a Boy Scout groups in 2013. Also in 2013, a tour was scheduled for the DPG colonel and his staff, but was later cancelled due other needs arising. In 2014, a tour will be offered to the newly arrived colonel.

8. Hunting

Fish Springs NWR provides a high quality public waterfowl hunting opportunity. Allowed hunting includes ducks, geese and coots in accordance with State and Federal regulations. Historically, waterfowl hunters visit the Refuge up to 2,000 times each year, with hunter densities rarely exceeding one hunter per 200 acres.

For 2013, waterfowl hunter visitation dropped from the previous year. Waterfowl numbers and hunting conditions were good early in the season, but extreme cold conditions in early December resulted in a substantial reduction in waterfowl numbers. Temperatures warmed back up by mid-December, but duck numbers from there on to the end of season were about half that of normal.

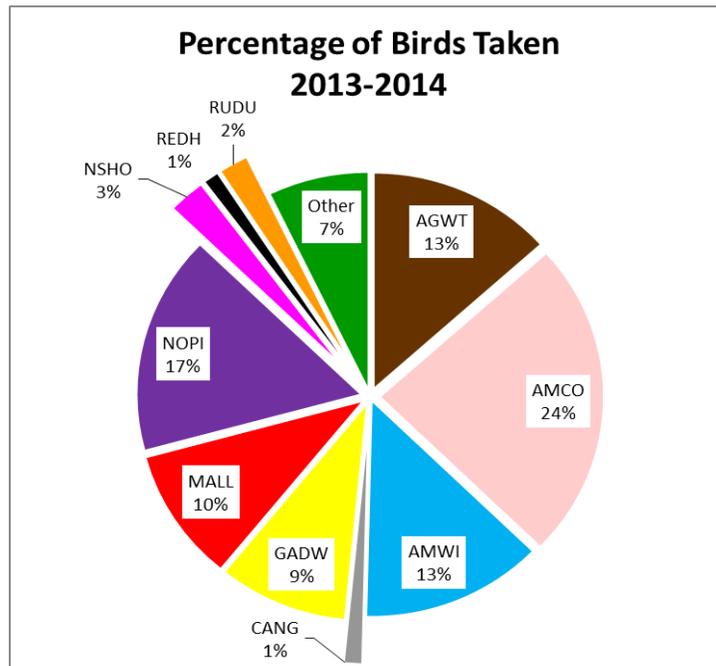
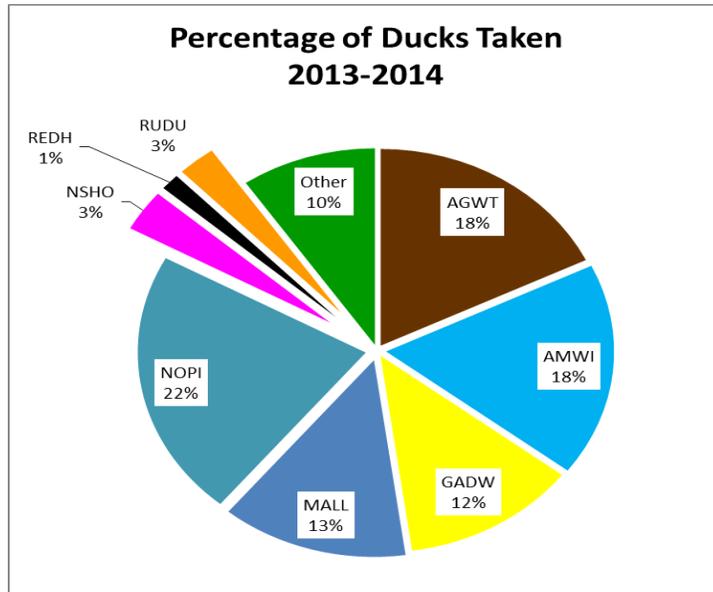
SEASON TOTALS

Hunt Season	Total Hunters	Total Birds	Total Ducks	Average Birds/Hunter/Day	Average Ducks/Hunter/Day
2013-14	661	1685	1262	2.5	1.9
2012-13	716	2480	1809	3.5	2.5
2011-12	490	1562	991	3.2	2.0
2010-11	473	912	575	1.9	1.2
2009-10	647	1288	833	2.0	1.3
2008-09	604	779	523	1.3	0.9

Bird species alpha codes (Pyle and DeSante 2003) used for the following charts depicting species taken in 2013-14:

AGWT = American green-winged teal
 AMCO = American coot
 AMWI = American wigeon
 CANG = Canada goose
 MALL = mallard

GADW = gadwall
 NOPI = northern pintail
 NSHO = northern shoveler
 REHD = redhead
 RUDU = ruddy duck



11. Wildlife Observation

The Refuge provides great opportunity for high quality wildlife observation in diverse habitats. Good viewing sites within the Refuge are primarily located along the auto tour and from the Thomas Ranch Watchable Wildlife Area. Non-motorized boating opportunity also provides high access to wildlife observation.

17. Law Enforcement

In 2013, law enforcement needs at the Refuge were covered by the Zone Officer and the Bear River Refuge LEO. Both officers covered the refuge on one weekend during the hunting season.

I. EQUIPMENT AND FACILITIES

A record of routine and annual maintenance activities for facilities and equipment can be found in the 2013 Annual Work Plan, a copy of which is in the Work Plan binder in the manager's office. A report on the maintenance work performed in 2013 for the impoundment and water delivery system can be found in Appendix B of the Annual Habitat Work Plan.

1. New Construction

NTR.

2. Rehabilitation

Rehabilitation work performed within the Walter Spring Marsh, the Mallard Unit, and the Shoveler Unit in 2013 is reported in Appendix B of the 2013 Annual Habitat Work Plan.

3. Major Maintenance

For water delivery major maintenance work within the water impoundment system in 2013, see Appendix B in the 2013 Annual Habitat Work Plan.

4. Equipment Utilization and Replacement

In 2013, the Chevrolet Tahoe was replaced with a Ford F-150 Crew Cab pickup.



2013 F150 Crew Cab Pickup Truck

5. Communications Systems

Phone and internet service is provided by Beehive. The Refuge also has two cell phones with service provided through AT&T that are used for general business trips by all staff (the immediate area around the Refuge is outside of the service area). A cell phone signal booster was purchased for the bunkhouse to allow cell phone use in our remote area where signal strength is weak. There are two radio communication systems: one system, with a single radio located in the main office, provides contact with Dugway Proving Grounds; the second is hand held Motorola radios.

6. Computer Systems

The Refuge has three desktop and three laptop computers of which the 4 permanent employees have an individual computer assigned to them for their own use. Two desktop computers are used by seasonal staff, one of which also supports our GIS needs.

7. Energy Conservation

An energy audit of the Station was performed in March, 2009 by Wasatch Energy Engineering. They provided nine recommendations for energy efficiency measures for the office, and another 18 measures for the residences. Many of those recommendations have been completed and other conservation measures have been taken.

8. Other

Fish Springs NWR has an approved landfill located on the Refuge. A solid waste landfill report is completed annually and submitted to the State of Utah. There has also been continued use of a recycling program on the Refuge.

Mark Cornyn, general engineer of R6 Engineering, visited Fish Springs to assess a number of facility issues the refuge manager brought to the attention of the refuge supervisor. A trip report with recommendations is pending.

These reported issues included:

- Bunkhouse fire pump – This pump is located in a downstairs apartment closet and it weeps water which has caused mold and mildew to spread into and through the adjoining wall affecting the health of tenants for both apartments. Water to the pump is gravity fed from the cistern and there is potential for the cistern to fully empty into the apartments.
- Building foundations – The aging concrete foundations of the office and residences (built in the 1960s) have considerable deterioration and flaking. Settling and separation of the residence's front porches have occurred and there are some cracks in the exterior brick work.
- Reverse osmosis system – The RO water treatment system, which was installed in 2001, is on the tail end of its useful life and is in need of replacement. There have been considerable annual maintenance repair costs each of the last several years.

- Infrared shop heaters – These heaters have not worked since they were installed despite two visits by an electrician to remedy the issue.

Additionally, a work order was developed through the refuge supervisor for the Refuge’s office building that provides for the replacement of the building’s composition roof, replacement of the RO water treatment system, and replacement of the propane heating furnace. This work order was added to the 5-year plan of Regional deferred maintenance projects.

J. OTHER ITEMS

3. Items of Interest

Off-work recreational activities provided good team-building opportunities, including visits to Lehman Caves and the bristle-cone pines of the Great Basin National Park, and Fish Lake of the Fish Lake National Forest.



Finding shelter in the bristle-cone pines



Fish Lake



Lehman Cave Tour

4. Credits

This report was compiled and written by wildlife refuge manager, Brian Allen. Photographs, figures, and tables were provided by wildlife biologist Tiffany Cummins and temporary staff supervised by her.

