REVIEW AND APPROVALS

FISH SPRINGS NATIONAL WILDLIFE REFUGE

Dugway, Utah

ANNUAL NARRATIVE

CALENDAR YEAR 2004

Refuge Manager Jay K. Banta Date 05-11-05

Refuge Supervisor Review Steve Berendzen Date 5/23/05

Regional Office Approval Richard A. Coleman Date 5/25/05

INTRODUCTION

Fish Springs National Wildlife Refuge was established in 1959 at the southern end of the Great Salt Lake Desert in western Utah. It encompasses 17,992 acres between two small mountain ranges. The refuge is located in Juab County, 78 miles northwest of Delta and 105 miles west and south of Tooele. Postal and commissary services are available at Dugway Proving Ground, a military base, 61 miles northeast of the Refuge.

There is evidence of continued Indian use of the area before the 19th century. Jedediah Smith visited the area in 1827. The Central Overland Stage, Pony Express, trans-continental telegraph and Lincoln Highway followed within one hundred years and left their marks within the present Refuge boundary.

The Refuge was established primarily to provide waterfowl nesting, wintering and migratory habitat in the Pacific Flyway. However, the Refuge is also important for other species of marsh birds, raptors and passerines, with 250 species being recorded since the Refuge was established. Many species of mammals native to the Great Basin also reside here or utilize the Refuge on a seasonal basis. The Utah Chub and speckled dace are the only native fish, and they are apparently responsible for the name of the area.

Five major springs and several lesser springs and seeps flow from the base of the eastern front of the Fish Springs Range. These warm, saline springs provide virtually all of the water for the 10,000 acre marsh system. The springs flow eastward into the marshlands and then east and northeast into the desert.

The development of nine shallow water impoundments was completed in 1964. The area contains approximately 8,905 acres of saline marsh, 7,084 acres of mud and alkali flats, and 2,003 acres of semi-desert uplands. At optimum water levels, there is approximately 3,500 surface acres of water in a complex of pools, sloughs, and springs. The saline and alkaline soils support relatively few species of plants. Vegetation in the marsh is primarily Olney's three-square saltgrass, alkali bulrush, hard-stem bulrush, wirerush, and saltgrass. Widgeongrass, muskgrass, and coontail are common in the springs and ditches. The upland area supports saltgrass, horsebrush, and shadscale.

G. WILDLIFE

H. PUBLIC USE

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

K. FEEDBACK

L. INFORMATION PACKET (Inside back cover)

A. HIGHLIGHTS

- New Refuge Operations Specialist hired in January (E 10).
- Christmas Bird Count in January attracts record number of counters (H 11).
- New volunteers arrive at Fish Springs NWR in April (E 4).
- Staff and volunteers band 466 birds in May (G 16).
- Migratory Bird Day was celebrated at Fish Springs NWR in May (H 6).
- Two STEP students were hired in May to begin work on the refuge (E 1).
- Chief of Refuges for Region 6 visits Fish Springs NWR in June (E 9).
- ARM Carpenter attends law enforcement training in June (E 9).
- Refuge has vehicle replaced with a new truck in June (I 4)
- Refuge receives new Least Chub strategy from Utah Department of Wildlife Resources (UDWR) (D 5).
- Staff complete new kiosk for refuge at main entrance in July (I1).
- Volunteers develop new vegetation monitoring program in August (E 4).
- Prescribed fires in Avocet and Spring Unit are a success in September (F 9).
- Cultural resources MOA with private company and Bureau of Land Management signed in November (D 3).
- Shop rehabilitation project completed in November (I 1).
- Refuge completes Comprehensive Conservation Plan (D 1).

B. Climatic Conditions

Weather conditions in 2004 ranged drastically from a blistering 101.5 degrees in July to a chilly 4.7 degrees in February. Temperatures fell right around the average for Fish Springs with slight variances in the fall months. The west desert was still in drought conditions with rainfall totaling 6.48 inches and snowfall totaling 9.25 inches in 2004.

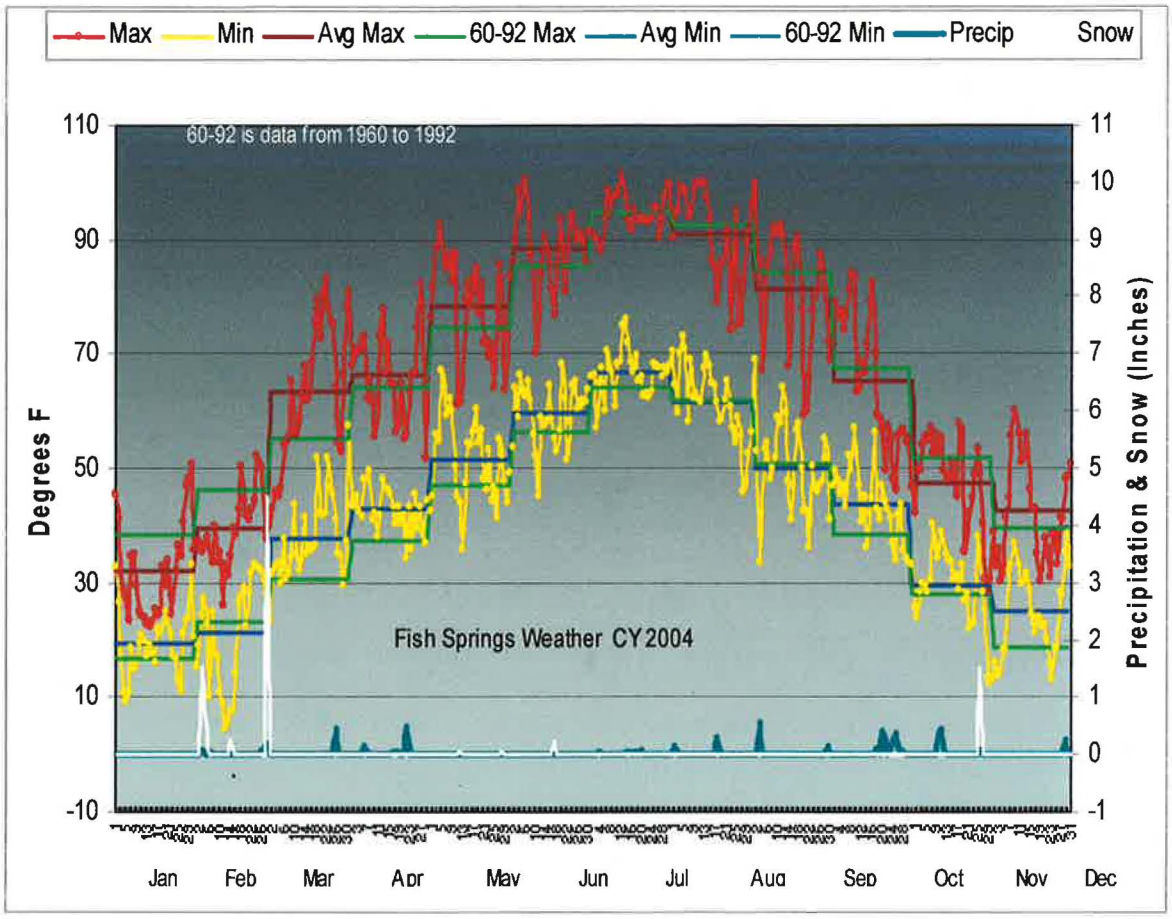


Fig.1 Weather chart for Refuge.

D. PLANNING

1. Comprehensive Conservation Plan (CCP)

Due to concerns about the lack of baseline biological information in our draft CCP, it was decided that a biologist from ERO, Inc. a contract biological assessment firm in Denver would visit the Refuge in February. They will be tasked with reviewing the proposed actions against the biological potential of the Refuge.

Ron Beane, a biologist with ERO Resources, a private firm contracted to review the internal review comments on the CCP, visited the Refuge on February 10-11.

Refuge Manager (RM) Banta traveled to Denver for CCP consultations with ERO staffers and the RO Planning staff on May 4-5.

RM Banta responded to comments made by several individuals associated with the internal review draft and worked with RO Planner Toni Griffin in securing a Section 7 consultation and preparing additional text for the soon to be released public review draft.

A Refuge milestone occurred on July 14 when the Notice of Availability for the Refuge's public review draft of the CCP was issued. Plans are for having a final by the end of the fiscal year.

Final touches on the text for the final draft of the CCP were made during the month. RM Banta and Toni Griffin and Linda Kelly of the RO Planning staff conducted briefing on the final draft document for Refuge Supervisor Berendzen, Refuge Chief Coleman and Regional Director Morganweck on August 31. It is hoped that the final document will be ready for public distribution by the end of September.

Incorporation of public and internal comments as well as final tweaking of our CCP was accomplished. Publication of the final document is scheduled for October.

The Refuge's final CCP and Summary were received from the printer in November and are now available for public distribution. We sure are glad that this long and winding road is now at an end.

2. Management Plan

The refuge's Integrated Pest Management Plan (IPM) was signed off on by the Regional Office in FY2004. The IPM plan was completed in FY2002 but several glitches in the system kept it from being approved until now.

4. Compliance with Environmental and Cultural Resource Mandates

Regional Office Safety Specialist Terry Black and Environmental Compliance Coordinator Jim Behrmann inspected the refuge on May 12th. The group toured/inspected the facilities to record the progress made by the staff and also safety and environmental deficiencies. All areas were discussed during the out-briefing and copies were left with staff on the deficiencies. The overall assessment of the refuge's safety and environmental compliance program were very high with very few deficiencies noted. Staff completed list of items on environmental compliance report in 2004 which included: fastening unsecured shelving in storage building, welding manhole, and installing a shut-off sign for fuel pumps.

Fig.2 Two different techniques used by Regional Office personnel. Terry Black instructs MM Layland on safety.

Fig.3 Jim Behrmann listens to RM Banta.

Assistant Refuge Manager (ARM) Carpenter, Maintenance Mechanic (MM) Layland, and Volulnteer Wethington assisted a recycling company with loading scrap iron from the Fish Springs' boneyard. Two 40 foot trailers were filled and nearly all of the old underground fuel tank and most of the Refuge's scrap metal pile were removed.

RM Banta met with UDWR Native Aquatic Species Biologist Krissy Wilson at the UDWR Springville Regional Office on October 6th. Responsibilities and logistics of a proposed project for expansion of least chub populations on the Refuge were identified in the meeting. The project is being submitted for Challenge Cost Share funding and, if implemented successfully, will represent a major addition of habitat for this candidate species at both the Refuge and the entire range points-of-view.

A MOA for the archaeological concerns surrounding the Beehive Telephone Company communications cable right-of-way on the Refuge was finally signed by all parties during the month. It has been nearly a year in the making and proved to be a real point of contention between the Service and the BLM.

The refuge continues its' recycling program to relieve the amount of garbage that goes into the landfill.

5. Research and Investigations

RM Banta met with Krissy Wilson and Carmen Baily of DWR and Marianne Crawford of the Salt Lake ES Field Office on July 21 to discuss further least chub work on the Refuge. There is some thought that using structural fish barriers might allow us to have least chub in some of the large impoundments and there by increase the available habitat for this candidate by many fold on the Refuge.

Brigham Young University graduate student Jill Ayala and four other students returned to the refuge on May 12th -15th. This is Jill's second and final year to collect data on the refuge's Least Chub population for her master thesis. The refuge will receive a copy of her thesis once completed.

A final report on a Refuge-wide small mammal inventory conducted by Shannon Robsen of the University of Utah was received in September. This project was funded under the Challenge Cost Share Program and will provide the Refuge with critical baseline small mammal data. Results of the study were one hundred eighty-four individuals of twelve different species were captured during 1,198 trap nights. Species included: White-tailed antelope ground squirrel, long-tailed pocket mouse, chisel toothed kangaroo rat, Ord's kangaroo rat, Montane vole, house mouse, desert woodrat, northern grasshopper mouse, canyon mouse, deer mouse, western harvest mouse, and vagrant shrew.

6. Other

Kendrick Thomas of the Federal Highway Administration visited the Refuge on July 21 to update our Refuge Roads inventory.

RM Banta attended the opening of a new exhibit on Utah's Public Lands at the Museum of Natural History on April 30th.

Regional Refuge Chief Rick Coleman visited the refuge on June 21st-22nd. All staff enjoyed an evening potluck with Rick and we believe he left with a better appreciation for our resources, our staff, and our peculiar logistics.

RM Banta attended the official groundbreaking for the new Bear River MBR visitor center on June 26th. The presence of former Refuge Supervisor Larry Shanks and his wife Carlene provided extra motivation to attend this well orchestrated event.

Fig.4 While at Fish Springs Rick Coleman recognized the fine contributions by volunteers Bill Wethington and Sharon Wallace.

E. ADMINISTRATION

Fig.5 Fish Springs NWR staff photo.
Back row D, F, C, E
Front row B, H, A

1. Personnel

A. Jay Banta	Refuge Manager, GS-12 PFT	(EOD 3-91)
B. Travis Carpenter	Asst. Refuge Manager, GS-11 PFT	(EOD 2-04)
C. Bret J. Layland	Maintenance Worker, WG-9 PFT	(EOD 2-90)
D. Robert Sims	Administrative Officer, GS-7 PFT	(EOD 5-00)
E. Rod Wright	Maintenance Worker, WG-8	(EOD-4-94)
F. Daniel Brown	Biological Science Technician, GS-4 T*	(EOD 4-02)
H. Deborah Hughes	Biological Science Technician, GS-4 T*	(EOD 4-04)

Travis Carpenter, from the Teddy Roosevelt National Wildlife Refuge Complex, was selected to fill the vacant Assistant Refuge Manager position in February.

Maintenance Worker (MW) Rod Wright returned from furlough status in March.

*Two STEP students were hired in May, Daniel Brown and Deborah Hughes.

Performance evaluations were completed in November for all staff.

4. Volunteer Program

The refuge received the benefit of nearly 2,127 hours of volunteer service in 2004. Volunteers Bill Wethington and Sharon Wallace started in April and finished in June accruing approximately 1300 hours. Bill spent the majority of his time spreading gravel, running the front-end loader, and grading roads while Sharon assisted with the bird banding program, office work, and running errands for the refuge. Both individuals received volunteer pins for reaching 4000 hours (Bill) and 3500 hours (Sharon) while at Fish Springs. They both will be sorely missed by the staff due to their great work ethic and positive attitudes toward the National Wildlife Refuge System.

Fig.5 Volunteers Sharon Wallace and Bill Wethington at Fish Springs NWR.

Fig.6 The bird banding crew, all volunteers, ran the banding program.

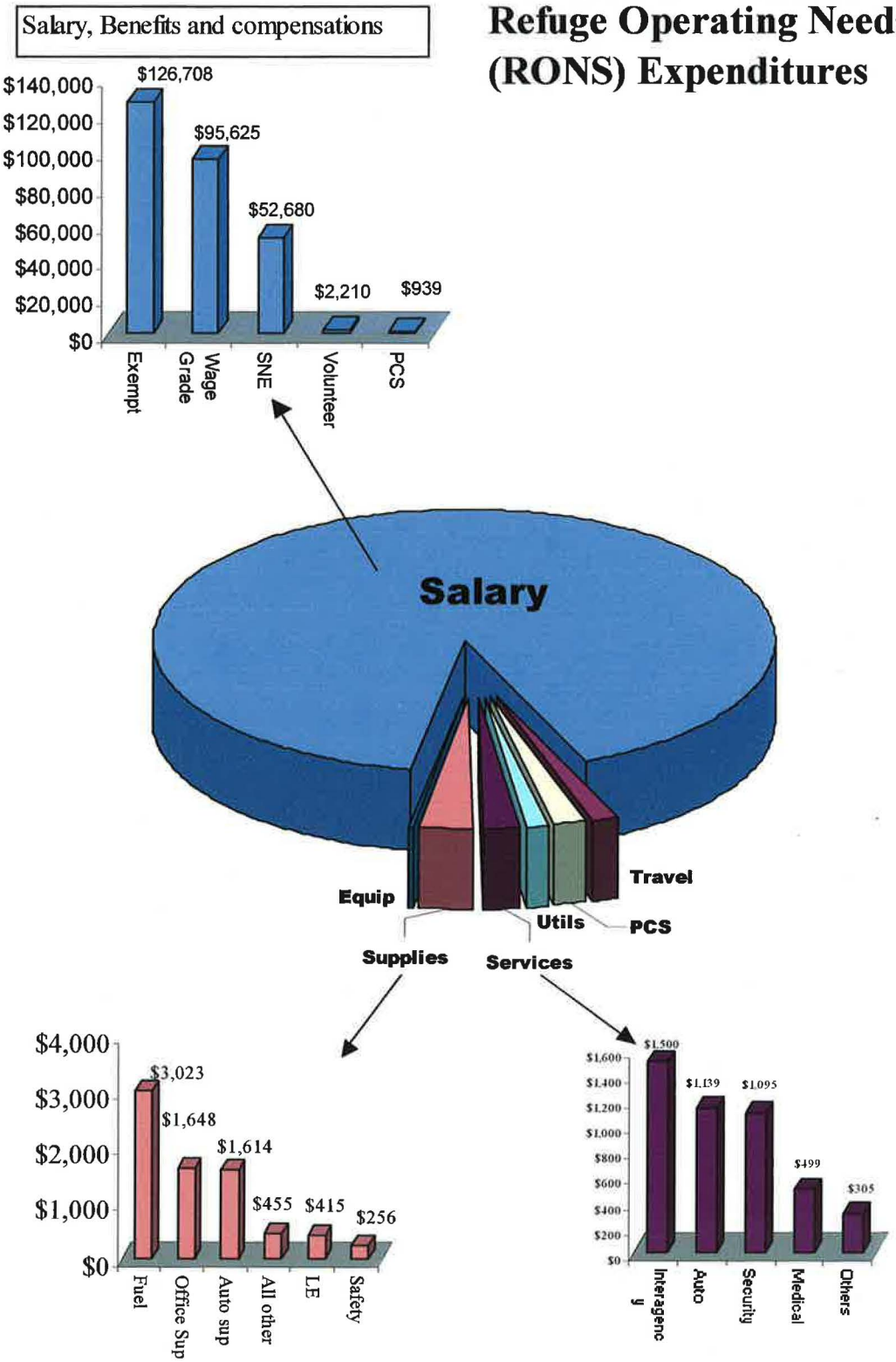
Volunteers also flocked to the banding program this year. The manager was actually turning volunteers down due to lack of space in the bunkhouse but had eight individuals to assist staff with the program. Steve and Caryl Baron received their 1000 hour volunteer pins while they were at Fish Springs.

The Audobon Society, Salt Lake Chapter, worked on refurbishing a refuge entrance sign on April 4th.

Bird Banding Volunteer Group included: Steve Baron, Caryl Baron, Robert Haupt, Jack Lauritzen, Jack Skalicky, and Donald Sanderson.

Other groups and individuals that volunteered on the refuge were the Terry Sadler, Dan White, Joe Jarvis, Fred Dunnell, Boy Scout Troop 517, Dan Brown, DeeJ Hughes, Dana Layland, and Frances Banta.
The refuge staff thanks each of these people for their willingness to help at the Fish Springs NWR.

5. Funding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$2,210
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$0
Exempt
Wage Grade
SNE
Volunteer
PCS
Refuge Operating Needs (RONS) Expenditures
Salary
Equip
Travel
Utils
PCS
Supplies
Services
$4,000
$3,000
$2,000
$1,000
$0
$3,023
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$455
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$256
Fuel
Office Sup
Auto sup
All other
LE
Safety
$1,600
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$800
$600
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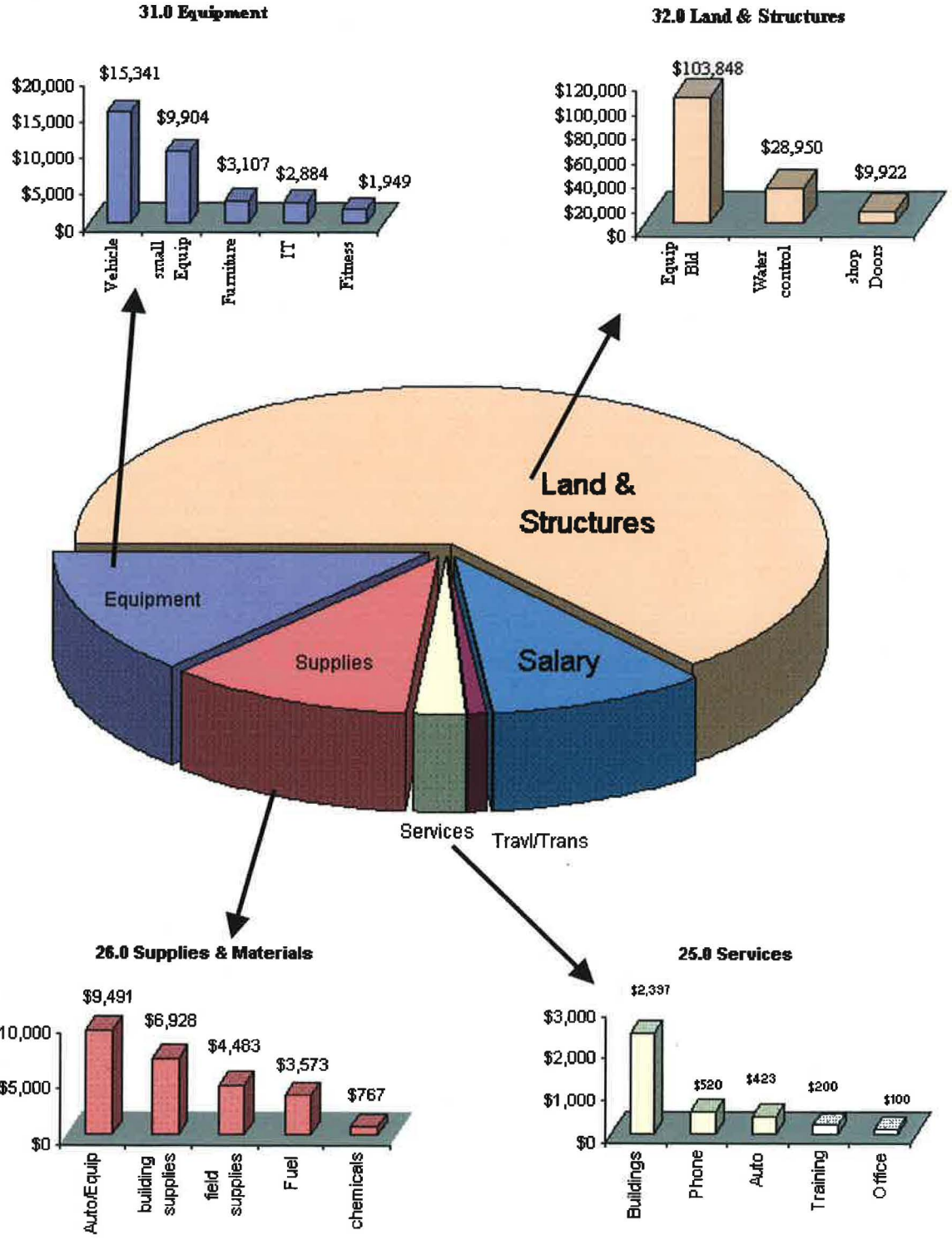
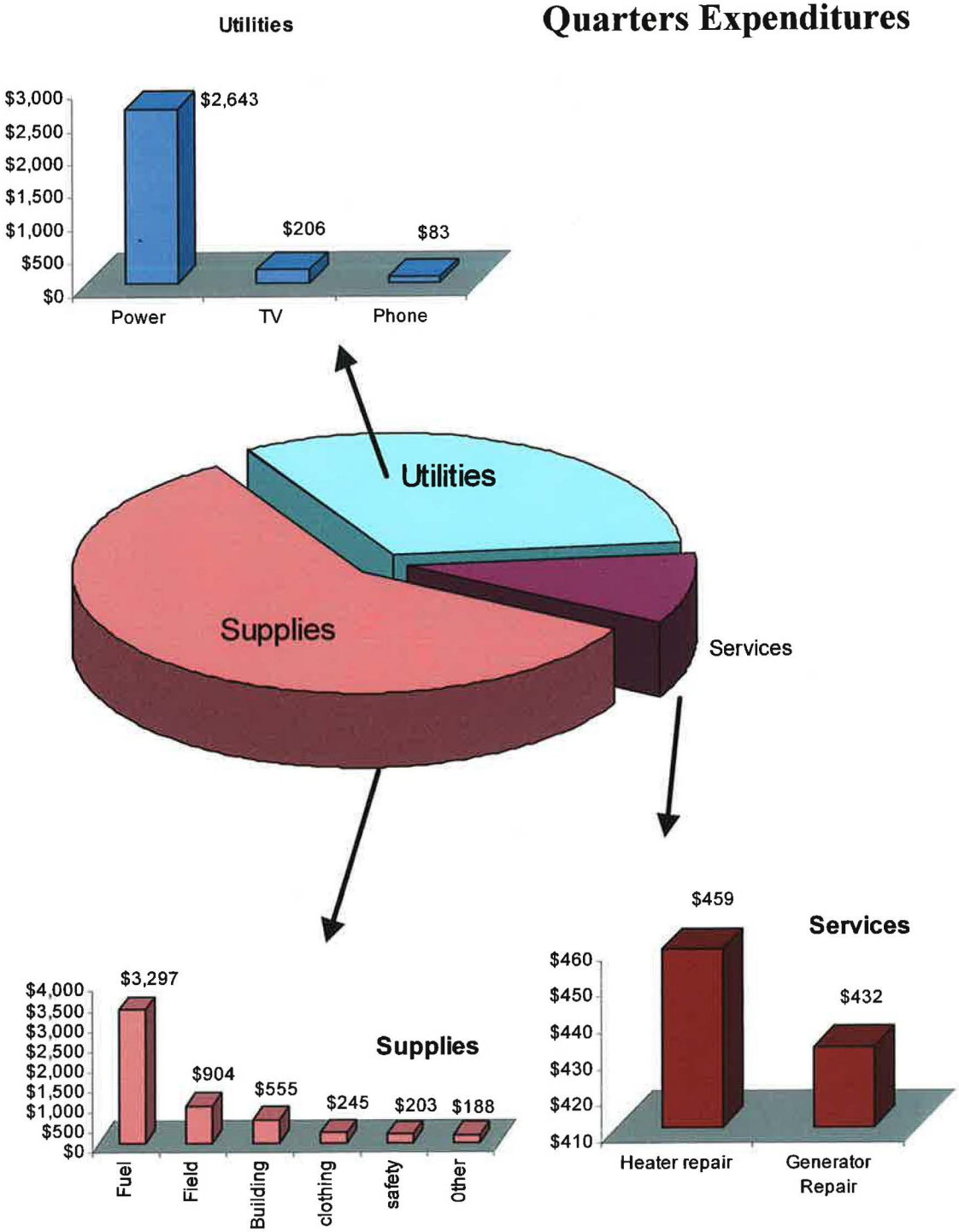
$305
Interagency
Auto
Security
Medical
Others

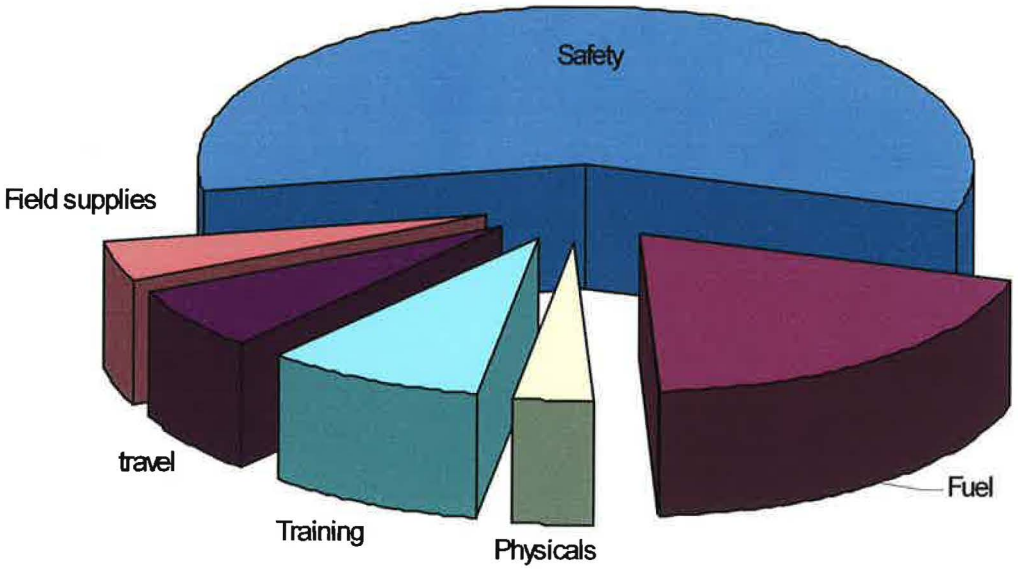
Annual Maintenance Expenditures



Quarters Expenditures



Fire Preparedness Expenditures



6. Safety

Official safety meetings were held quarterly during the year. Safety topics discussed pertained to seasonal shifts in weather related work conditions, personal protective gear, West Nile Virus, and injuries to the back.
The following safety videos were viewed during 2004:

- Heat Stress
-Back Prevention

MM Layland conducted an All-terrain Vehicle training for BTs Brown and Hughes in May.

Fig.7 MW Layland conducts an ATV safety course for the biological science technicians.

MM Layland smashed his finger in the dump truck tailgate in September requiring a trip to the hospital for seven stiches. He was off several days recovering in September.

7. Technical Assistance

On January 21st and 22nd, Gale Green, Regional Fire Ecologist, Jeff King, Regional IPM Coordinator, and Greg Langer, Deputy Refuge Supervisor visited the Refuge to view and provide guidance on the Refuge's phragmities problems.

On June 3rd the United States Air Force called upon Fish Springs personnel and equipment to assist them with recovery of a fuel pod from a salt plant evaporation pond near Wendover, NV. MM Layland responded with the airboat and received an escort from the Utah Highway Patrol to the site. MM Layland used the airboat to recover pieces of the fuel pod and escort Generals, Sheriff Department personnel, and hazardous material folks around the pond.

8. Training/Miscellaneous

RM Banta attended the Law Enforcement Refresher Training at Mirana in March.

ARM Carpenter and MM Layland attended the Service Asset Maintenance Management System (SAMMS) training at the National Conservation Training Center in West Virginia in February.

RM Banta and ARM Carpenter attended the Project Leader Meeting in Missoula, MT on April 12th.

ARM Carpenter completed the S-290 Intermediate Wildland Fire Behavior Course in May.

ARM Carpenter completed the requirements to become a commissioned refuge officer by completing the Natural Resource Police Training, Refuge Officer Basic School and the Field Training and Evaluation Program in 2004.

RM Banta and BT Brown completed annual fire refresher training and both received "red" cards during July.

Administration Officer (AO) Sims completed the Internet Warrant refresher course in August.

MM Layland and MW Wright attended the annual Maintenance Workshop in Colorado. Both received certification in load securement while they were there.

Refuge staff completed credit card refresher training during August.

RM Banta was selected and participated in the Fitness Validation Training for Department of Interior Law Enforcement Officers in Boulder City, Nevada on October 26th.

F. HABITAT MANAGEMENT

1. General

Fish Springs NWR is characterized by an extensive saline marsh system amid the Great Basin desert ecosystem. Nine man-made impoundments compromise roughly 9,300 acres of the 17,992 acre refuge. At optimum water levels, approximately 3,500 surface acres of water exist in a complex of springs, canals, sloughs, and open pools. The average depth of the impoundments at optimum water elevations is 1.7 feet. Desert uplands and alkali flats typify areas outside the dike system.

Marsh meadow vegetation is characterized by saltgrass (*Distichlis spicata)*, marsh cane *(Phragmites australis)*, and scattered stands of alkali sacaton *(Sporobolus airoides).* Marsh emergents are primarily Olney's three-square bulrush *(Scirpus americanus)*, and wire rush *(Juncus arcticus)*. Narrowleaf cattail *(Typha domingensis)*, alkali bulrush *(Scirpus maritimus)*, and hardstem bulrush *(S. acutus)* are also present. The principle submergents are widgeongrass

(Ruppia maritime), muskgrass *(Chara spp.)*, spiny naiad *(Najas marina)*, and coontail *(Ceratophyllum demersum)*. Upland portions of the refuge are characterized by fourwing saltbush *(Atriplex canescens)*, shadscale saltbush *(A. confertifolia)*, and greasewood *(Sarcobatus vermiculatus)*. High lava peaks and cliffs of the Fish Springs Mountain Range encompass a small area in the northwest corner of the refuge. Soils are generally sandy-clay in the marshes with peat deposits occurring near the springs. Upland soils are very alkaline, thus limiting plant diversity.

Fig.8 Milkweed blooming on one of the impoundments.

2. Wetlands

The refuge receives virtually all of its water from five major springs and several lesser springs located along the eastern base of the Fish Springs Range. The warm saline springs range from 70 degrees F to 80 degrees F, year round. Conductivity measurements at the six southern-most springs range from 2900 to 3400 umhos/cm. North Spring measures 5100 umhos/cm. At these levels, all springs are considered moderately brackish.

Spring output is insufficient to counteract high evaporation rates. Therefore, summer water levels drop significantly in most impoundments. Excess winter and early spring flows are diverted though the impoundments in an attempt to dilute the concentration of salt in the pools. All excess water eventually drains into the desert.

High water salinities and past water management practices have helped shape a unique complex of marsh impoundments. Southern areas such as Avocet Unit receive nearly year-round water flow, therefore remaining less saline. These areas support extensive stands of emergent vegetation. These units supply the bulk of the high quality nesting habitat for ducks, colonial birds, and other marsh birds. In contrast, northern units, such as Gadwall and Harrison, dry up each summer and are characterized by highly saline waters and soil. These areas support little emergent vegetation and consist primarily of saltgrass and *Salicornia spp.* The corresponding wildlife use is generally

of a seasonal nature and relatively low. All units have developed unique vegetative and wildlife use regimes based on their physical features, water flows, and salinities.

Avocet Unit was put through the drawdown cycle this year. The drawdown was initiated in August which turned out to be too late to dry-up the unit. The refuge has changed its burning plan from summer/spring burns to fall burns in hopes of controlling the Phragmites in the units. Prescribed fire is also important tool because it rejuvenates decadent stands of vegetation and release nutrients tied up in residual growths of the various cover types.

Volunteers and refuge staff initiated a vegetation study in the Avocet Unit in August. Joe Jarvis and Fred Dunnell established eight vegetation transects which will be monitored to see the response to fire, flooding, and chemical applications. Manager Banta added intense disking in several areas (primarily dense Phragmites stands) to determine if this is an effective way to control or reduce Phragmites.

9. Fire Management

The refuge executed a prescribed fire in September. Avocet and the Spring Units were burned with a combined total of nearly 1900 acres. Avocet unit was subject to a management drawdown as well. The dewatering began in August with the unit becoming almost completely dry by September. The prescribed fire was conducted on September 8th and 9th by a fire staff from the Charles M. Russell, Red Rocks, Fish Springs, and Browns Park NWRs. FMO Mike Granger from the Charles M. Russell NWR led the fire crew on the two day fire detail.

ARM Carpenter attended the Central Utah Fire Management Team meeting in Richfield on March 19th. The Annual Operating Plan was reviewed and up-dated for FY04.

ARM Carpenter attended S-290 Intermediate Wildland Fire Behavior course in Richfield in May.

RM Banta and BT Brown took the arduous pack test and refresher course to receive their red cards for fire fighting.

Fig.9 Picture of fire staff (Left to Right): M.Granger, CMRNWR, A. Lisk, BR, K.Beck, BR, B.Pratt, CMRNWR, L. Slepetski, RRNWR, J.Flores, BPNWR, N. Hawkaluk, CMRNWR.

10. Pest Control

Noxious weeds at Fish Springs NWR have been reduced or controlled by mechanical and chemical practices for the past 20 years. All noxious weeds on the refuge are considered priority species. Due to the refuges remote location, eliminating seed sources for possible colonization of land adjacent to the refuge is very important. The refuge's Integrated Pest Management Plan was approved in 2004 by the Regional Office. Noxious weeds found on the refuge as of 2004 include: salt cedar *(Tamarix spp.)*, tall whitetop *(Lepedium latifolium)*, Squarrose knapweed *(Centaurea virgata Lam. Ssp. Squarrose Gugl)*, and common reed *(Phragmites australis)*. The refuge has actively targeted salt cedar, whitetop, and knapweed for complete eradication. Efforts to control salt cedar have been ongoing, at a varying level of intensity, since the refuge was established. Efforts at chemical control were intensified during the early 1980s and salt cedar was reduced markedly. Whitetop was first detected on the refuge in 1991. Three colonies were detected and removal included mechanical and pulling by hand which proved to be ineffective. By the late 1990s, refuge staff had incorporated chemical control of whitetop with good results.

The refuge's Integrated Pest Management (IPM) plan was completed in FY03 but was approved by the regional office in FY04. The plan detailed objectives to control and reduce invasive and nuisance plants on the refuge utilizing several techniques. The Pesticide-Use-Proposals for six chemicals were included in the IPM plan to be used on the refuge.

BT Hughes and Brown began work on the refuge's Integrated Pest Management plan on May 3rd. Approximately 52 plots of whitetop ranging from 1<1500 plants were sprayed with Escort/Patriot. All plots were GPS and several individual plants were flagged for monitoring purposes. Plots were re-visited to ensure all plants were sprayed and new ones treated.

On 5/17 , staff began spraying squarrose knapweed along the Pony Express Trail with the chemical Grazon. All areas and plants were GPS for monitoring purposes.

Staff began treating the Phragmites in Gadwall, Harrison, Mallard, and Curlew Units in July with Aqua Neat and Mirage. Several of these areas are being monitored to determine best application time and whether any other techniques such as mowing, discing, and/or burning in conjunction with spraying help control the plant. Staff treated several stands of phragmites in October in the Avocet Unit as test plots. A tractor and disc were borrowed from Ouray NWR in November. The refuge selected two areas that had dense phragmites stands and disced the area. The idea is to expose the roots to freezing temperatures and then flood the site during the winter.

BTs began targeting saltcedar in August in Avocet and Harrison Units. Approximately 700 to 1,000 plants were sprayed, representing about half or more of all saltcedar present on the refuge.

ARM Carpenter was certified by the Utah Department of Agriculture as a pesticide applicator in April.

RM Banta provided a tour of refuge invasive vegetation control site to Darrell Cook, Utah Department of Agriculture Quality Compliance Specialist, Greg Searle, Weed Control Division Manager for Utah County, and Laury Hardy, Weed Control Supervisor for Toole County. Topics of discussion were our great success at saltcedar control, efforts at phragmites control, and the recent lack of effort at weed control on the adjacent Dugway Proving Ground.

11. Water Rights

The refuge controls all water rights to the spring outflows. The Certificate of Water Appropriation is for 43.88 cubic feet per second (cfs).

Fig.10 Picture of South Spring flume.

G. WILDLIFE

2. Endangered or Threatened Species

Bald eagles are currently listed as a Threatened species and are regularly seen on the refuge. Sightings tend be intermittent, as eagles roam about the area, but the majority of the sightings are at the Thomas Ranch Wildlife Viewing Area. This area contains the only roosting site in the vicinity of the marsh or on the frozen impoundment areas where they can often been seen feeding on waterfowl. Utah has one of the highest wintering populations of bald eagles in the lower 48.

A peregrine falcon was observed in March at the Thomas Ranch Wildlife Viewing Area.

The refuge hosts a variety of candidate species for T&E listing. Ferruginous hawks and black terns are occasionally recorded on the refuge. Western burrowing owls are not common, but have been sighted on the refuge.

White-faced ibis are a nesting species on the refuge.

The Bonneville Southern pocket gopher *(Thomomys umbrinus Bonneville)* is known to exist in the Fish Springs area and nowhere else in the state. There have been no studies conducted to determine its status. This subspecies is a candidate 2 species for listing.

The refuge is host to a number of species that are state classified as Species of Special Concern, due to limited distribution or declining populations at the statewide level.

Long-billed curlews nest in fair numbers on the refuge but little is known of their true status. Western snowy plovers also nest on the refuge, and can be found throughout the summer foraging in the Harrison Unit.

Common yellowthroats can be found nesting throughout the marsh during the breeding season.

American white pelicans and Caspian terns, as well as an occasional osprey, can be found during spring passage.

3. Waterfowl

Fish Springs is an important wintering and nesting area for a variety of waterfowl. Some of the common species found on the refuge are mallard, Northern pintail, Northern shoveler, cinnamon teal, green-winged teal, gadwall, redhead, canvasback, ruddy duck, American widgeon, and bufflehead. The refuge continues to monitor waterfowl numbers by conducting bi-monthly surveys. Numbers of ducks and species are recorded and entered into the refuge's migratory bird database.

The Christmas Bird Count (CBC) in January recorded the following waterfowl: Coot-1288, American Widgeon-1320, Northern Pintail-1471, Northern Shoveler-28, Gadwall-1225, Mallard-1162, Redhead-15, Green-winged teal-2880, Common Goldeneye-37, Ring-necked duck-35, Others-14, Canada Goose-604, and Tundra Swan-95.

A Eurasian widgeon was a highlight on the CBC in January.

A Pacific loon was recorded on the refuge in May by birder's Tom and Colby Newman.

4. Marsh and Water Birds

The refuge provides nesting, migratory and wintering habitats for a variety of marsh-dwelling species. Grebes, herons, egrets, and rails are the most common. American white pelicans and double-crested cormorants are present during the summer and the refuge documented the first nesting pair of cormorants on the refuge. The nest was observed and recorded in the Shoveler Unit.

Virginia rails, soras, and American bitterns nest on the refuge in unknown numbers. Fish Springs provides one of the few, consistent wintering sites for these species in Utah.

Four species of grebes are present on the refuge with pied-billed grebes being the only year-round resident. Eared grebes and western grebes were documented throughout the breeding season in the impoundments.

Nine great blue herons, 26 black-crowned night herons, four American bitterns, one snowy egret, and one white-faced ibis were noted on the CBC in January.

Several pairs of sandhill cranes were observed on the refuge in April, May, and June. Two of the cranes had leg bands (318 and 330) which were recorded.

5. Shorebirds, Gulls, Terns and Allied Species

Eighteen species of shorebirds were recorded on the refuge in 2004. Killdeer, black-necked stilt, American avocet, and Wilson phalarope are common nesters. Snowy plovers, long-billed curlews, and willets also nest. Long-billed dowitchers, western and least sandpipers, yellowlegs, red-necked phalaropes, and marbled godwits are common migrants. Greater yellowlegs and snipe are the only regular wintering species, with long-billed dowitchers making an occasional showing.

Snowy plovers, a Species of Special Concern, were observed in good numbers again this year. They are primarily documented in the Harrison Unit of the refuge.

Ring-billed and California gulls were present throughout much of the year, though neither species breeds on the refuge. Aside from Utah Lake, Fish Springs supports the only known summering population of ring-billed gulls in Utah. Franklin's and Bonaparte's gulls were seen in low numbers during migration.

Three species of terns are found on the refuge. Forester's and Caspian terns are found as both a nesting and occasional fall migrant on the refuge, while black terns are frequently observed spring migrants.

Shorebirds on the CBC were represented by a lone killdeer, a pair of lesser yellowlegs, 18 greater yellowlegs, and a record 10 common snipe.

6. Raptors

Twelve species of raptors (including two owl species) were recorded in 2004. Northern harriers were present and nesting in the marsh.

Golden eagles and prairie falcons nest adjacent to the refuge and are frequently seen hunting on the refuge. Short-eared owls were observed this year in April and May during migratory bird surveys. Rough-legged hawks are winter visitors, while red-tailed hawks are occasionally observed throughout the year.

A peregrine falcon was observed in April at the Thomas Ranch Wildlife Viewing Area. Coopers hawk, merlins, and sharp-shinned hawks were also seen hunting around the housing units.

7. Other Migratory Birds

The refuge serves as a magnet to many migrating birds, though stopovers tend to be very short due to the lack of habitat and foraging areas (trees) for most species. This makes observations difficult and, thus accounts for sporadic sightings of many species.

This years banding effort fell short of last years numbers possibly due to weather patterns. A new species was recorded in May, a northern parula was captured and banded by volunteer Robert Haupt. The northern parula is a traditional eastern bird and has only been documented in Utah five or six times according to bird experts. Refuge staff and volunteers banded 466 birds with 48 species represented during May.

8. Game Mammals

A variety of game mammals utilize the refuge, though most are rarely observed. Mule deer, in small numbers, are common from mid-May to October on the refuge. Occasionally the deer particularly the does and fawns will feed and bed on the refuge. About 15 deer were observed on the refuge throughout the late summer and fall.

Pronghorn are observed regularly during the summer and fall along the northern portion of the refuge. They appeared to move out of the area during the state's hunting season, as disturbance increases.

Fig.11 Another satisfied visitor at the refuge kiosk. We count everyone and everything that triggers the road counter!

Coyotes are commonly observed throughout the year. Blacktail jackrabbits and desert cottontails are also observed on the refuge. Hunting of game mammals is not allowed on the refuge.

Seven mule deer and one pronghorn were documented on the refuge in May.

10. Other Resident Wildlife

Over forty species of mammals have been recorded on the refuge, of which nineteen are small rodents. Muskrat populations have remained strong throughout the marsh this year. There has been no effort to trap the muskrats since 1995.

Badgers are also seen on the refuge sporadically. They have been observed at the landfill and around the marsh area.

Bats are frequent visitors to the refuge in low numbers during the warmer months. They are common around the housing and office areas where the lighted areas create excellent foraging habitat.

Seven species of lizards, five snakes, and two frogs reside on the refuge. The Great Basin sagebrush lizard, desert side-blotched lizard, western fence lizard, gopher snake, and Great Basin rattlesnake are commonly observed species. The introduced bullfrog is common in most springs and canals, while the native leopard frog appears to be decreasing.

11. Fisheries Resource

The native Utah chub (*Gila atraria)*, Least Chub and introduced Gambusia (mosquito fish) are found in the springs and canals on the refuge. Native speckled dace also occur in low numbers. The Least Chub, a candidate species, were introduced in Walter and Deadman's Springs. Brigham Young University graduate student, Jill Ayala, completed her field work at the refuge on the Least Chub population in Walter Spring in 2004. This was Jill's second year on the refuge collecting data.

RM Banta met with Krissy Wilson and Carmen Baily of UDWR and Marianne Crawford of the Salt Lake ES Field Office on July 21st to discuss least chub work on the refuge. The idea is to use structural fish barriers on the water control structures in the larger impoundments to prevent mosquito fish from entering.

14. Scientific Collections

Jill Ayala, a masters candidate from BYU, collected data on the Least Chub populations in Walter Springs in 2004. Her study is to document the decline of Least Chub from increasing numbers of mosquito fish. Jill completed her field work in 2004 and will send the refuge a copy of her completed thesis in 2005.

A Special Use Permit was issue during November to Dr. Chris Wilson of the DWR Fisheries Research Station from Utah State University. Dr. Wilson was collecting *Melanoides* snails and mosquitofish to check for a potentially serious trematode *Centrocesuts formosanus,* a fluke that uses the snail as a first intermediate host, a fish or a frog as a second intermediate host, and

piciverous birds or mammals as the definitive host. This helminth was first document in mosquitofish from Fish Springs last year. The *Melanoides* snail has invaded much of the area of the Refuge springs in the last year so the fluke may be quite widespread. The fluke has been reported in humans, dogs, cats, and rodents.

16. Marking and Banding

Refuge staff and volunteers banded 466 birds with 48 species represented during May. The numbers were noticeably down from previous years but this could be contributed to fewer cold fronts moving through or other natural occurrences. The banding was highlighted with the capture of a Northern Parula, a first for the refuge. It is traditionally eastern bird and has only been documented in Utah five or six times according to bird experts. A picture and information on the bird were posted on the Fish Springs website.

Fig.12 A Northern Parula found its way into our nets in 2004

Fig.13 Hazard duty pay?

H. PUBLIC USE

1. General

Visitation during 2004 at Fish Springs NWR

MONTH	VISITOR NUMBER	HUNTER NUMBER
January	29	182
February	14	x
March	154	x
April	183	x
May	295	x
June	176	x
July	89	x
August	79	x
September	79	x
October	120	224
November	26	151
December	29	291
TOTALS	**1,273**	**848**

5. Interpretive Tour Routes

Fish Springs has an 11 mile self-guided tour route which is open daily. Starting at the visitor contact station, visitors pass through a variety of habitat types including desert shrublands, saltgrass meadows, and marshlands. A new kiosk was constructed at the entrance of the tour route and the old kiosk will be erected at the Thomas Ranch Wildlife Viewing Area.

6. Interpretive Exhibits and Demonstrations

AO Sims continues to improve the Fish Springs website. The websites includes activities on the refuge, wildlife, volunteer programs, directions and road conditions, staff, and in May a history of the refuge. The website has been an excellent way for visitors to keep up with the refuge and its activities.

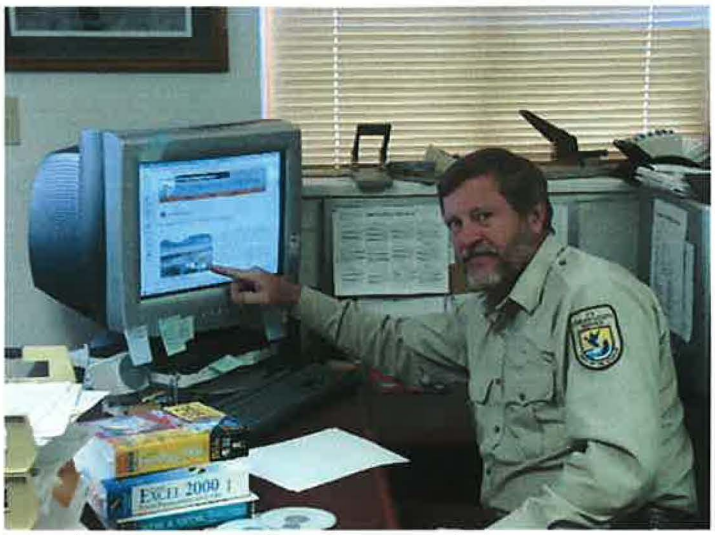


Fig.14 AO Sims works on the refuge's website.

ARM Carpenter participated in the Boy Scout Expo in Lehi on 5/01. The Fish & Wildlife Service was asked to work at the "Leave No Trace" booth along with the Bureau of Land Management, Forest Service, and National Park Service personnel. Approximately 10,000 people showed up for the event.

On May 9th, the Refuge hosted our annual International Migratory Bird day event. Visitation for the event was light but those that did come were enthusiastic and were treated to fine birding tours with our stalwart tour guide Tom Neuman.

RM Banta conducted a tour at the request of Colonel Watcott, United States Army, Dugway Proving Ground, for several Department of Defense staffers in August.

RM Banta conducted a tour for approximately 50 visitors who were part of an organized tour of Pony Express sites.


Fig.15 RM Banta preaches as these hungry visitors as they eat their lunch.

Fig.16 Staff worked the Leave No Trace booth at the Boy Scout Expo in Lehi.

RM Banta served as one of the tour guides for a multi-area tour of significant Lincoln Highway sites on October 9th for approximately 40 people. The tour included critical sites on the Dugway Proving Ground, Callao, and Fish Springs NWR.

8. Hunting

Hunting of ducks and coots is the only form of hunting allowed on the refuge.

Waterfowl and Coot harvest for 2004.

SPECIES	HARVEST			
	January	October	November	December
Mallard	108	65	35	110
Gadwall	166	29	32	93
Northern Pintail	0	25	0	45
Green-winged Teal	112	27	16	30
Cinnamon Teal	0	24	0	0
American Widgeon	161	72	57	130
Redhead	0	2	0	0
Northern Shoveler	1	10	11	10
Bufflehead	3	0	2	3
Common Goldeneye	10	0	0	1
Ruddyduck	0	0	0	0
American Coot	20	24	46	192
Other	0	8	3	0
TOTALS	568	286	202	619
Average: Birds/Hunters	3.1	1.3	1.3	2.1

Hunter registration is mandatory at Fish Springs and efforts in the past with compliance have appeared to work. There are exceptions every year where only the driver from a party will register.

September 25th marked the annual youth waterfowl hunt day at the refuge. There was a large turn-out with 27 hunters registering that day. Success was low at 2.5 birds/hunter but these young folks managed to eclipse the adult hunter average for the general opener a week later.

There were 1,393 ducks and 282 coots reported harvested in 2004. The total duck harvest consisted of 22% mallard, 22% gadwall, 13% green-winged teal, 30% American widgeon, and 13% other.

17. Law Enforcement

Fish Springs currently has two commissioned law enforcement officers, Manager Banta and Assistant Manager Carpenter. The majority of the law enforcement work is during the waterfowl season and sporadically during the other months. Fish Springs, due to its extreme remoteness, requires two dual function officers in case there is a need for back-up. It would take nearly 2.5 hours for any assistance to get to the refuge and respond. The Regional Office has been very supportive of keeping both the manager and assistant manager as dual function law enforcement officers.

ARM Carpenter attended all the necessary training in 2004 and 2005 to become a commissioned refuge law enforcement officer.

RM Banta gave a presentation to a wildlife law enforcement class at Brigham Young University on the National Wildlife Refuge System's law enforcement program on March 29th.

Fig.17 RM Banta and ZO Ronish discuss LE issues.

Zone Officer Clay Ronish visited the refuge on April 6th to meet with refuge law enforcement staff. ZO Ronish briefed the staff on his duties as a zone officer for the refuge and what we can expect from him. RM Banta gave him a tour of the refuge and explained what type of law enforcement problems the refuge deals with.

RM Banta worked another year almost alone, he was relieved by Dan Schadd Ouray NWR, Jay Shirley UDNR, and Arron Johnson Bear River NWR during the hunting season. Carpenter assisted one weekend between ROBS and FTEP.

RM Banta attended annual LE Inservice training from January 28-Feb 2nd.

Fig.18 ARM Carpenter at CMR NWR in Montana for LE field training.

The following violations and their dispositions were noted during the year:

Offense	Number	Fine
➢ Unsigned migratory waterfowl stamp	1	$150
➢ Unsigned migratory waterfowl stamp	1	$50
➢ Unsigned migratory waterfowl stamp	1	$20
➢ Hunting w/o HIP number	1	$50
➢ Hunting w/o HIP number	1	$110
➢ Improperly licensed vehicle	1	Dismissed
➢ Improperly licensed vehicle	1	Dismissed
➢ Take of pintail in closed season	1	$300
➢ Take of pintail in closed season	1	$300
➢ Take of pintail in closed season	1	Outstanding
TOTAL FINES		**$980**

I. EQUIPMENT AND FACILITIES

1. New Construction

Volunteers Wethington and Wallace completed the blue goose project in May. Eleven metal geese were sanded and painted and attached to nine gates on the refuge.

Volunteer Wethington and MW Wright installed a refuge entrance sign on the Sand Pass Road.

Fig.19 New sign on the Sand Pass entrance.

Fig.20 New blue goose cutouts were placed on every gate.

MW Wright put the finishing touches on our new contact kiosk during July. The new kiosk, modeled along the line of FWS standards, replaces one that was built in 1980. The old one, still functional, will be rehabilitated and placed at the Thomas Ranch Watchable Wildlife Area and will be used to interpret the rich human history of the Refuge and that site.

Fig.21 Construction of new kiosk at main refuge entrance.

Fig.22 Finished product, looks great Rodney.

Construction of the new shop addition and rehabilitation was primarily complete on November 8th . Mike Custer, RO Engineering staffer who handled this project came out on that date for a final inspection. The new addition will allow for parking of all the refuge's heavy equipment, dump truck, motorgrader, stakebody truck, and escavator. This keeps these pieces of equipment out of the weather and in a secure area.

Fig.23 The new addition to our refuge shop.

Overhead door installation on the original parking stall section of the shop was completed by Phil's Glass and Door of Tooele during November. This will allow for all parking stall and the shop to be secured as well as providing additional protection for equipment pared in those stalls.

A new water control structure was installed to replace WCS 11 in October. The new structure consists of a concrete culvert and screwgate which replaces a double-bay drop-log structure.

2. <u>Rehabilitation</u>

All wood/coal stove chimneys were swept during January.

New parking-brake shoes were installed in the Case front-end loader in March.

The Chevrolet Tahoe's ABS brake system was repaired under warranty in Tooele Chevrolet dealership.

The 1991 Dodge pickup had new rear brake shoes replaced in April.

A new motor was ordered and installed for the coal stove fan in Quarters 5.

Approx. 12' of sidewalk leading to the Refuge's apartment at Qtrs. 41 was replaced.

The office used by the Maintenance staff was painted and blinds were placed during the month. Additional office furniture was also placed in the office to accommodate increased computer needs for SAMMS and to provide seasonal and volunteer staff access to a computer with internet capability.

MW Layland enclosed the diesel fuel line in conduit between the refuge's bulk tank and the back-up generators to meet Spill Prevention requirements.

Volunteer Wethington and MW Layland replaced the old cattle guard at the main entrance of the refuge with a new one. The new cattle guard was wider than the old one which made it easier for heavy equipment and trucks to enter the refuge.

The back screen porch on Qtrs. 5 was refurbished in August. The refurbishing included replacing several rotted and loose boards, the screen restretched and fastened, and a new paint job.

The gate lock on a gate near North Spring was vandalized during the month but was not successfully breached. MW Wright managed to get it unlocked and replaced.

A new tooth was installed and blade guides tighten on the sidebar mower on the John Deere tractor.

3. Major Maintenance

MM Layland replaced a defective and warranted circuit board on the refuge's reverse osmosis water treatment unit in June.

MM Layland discovered a large hole in a direction dike that was allowing at least half of the Middle Spring Flow bypass the measuring flume. Fill was hauled to reconstruct the dike.

A spur dike in Spring Unit was reconstructed during September. The damage resulted from muskrat burrowing into the levee causing half the flow from Thomas Spring be diverted away from the flume.

MM Layland completed repairs to a dike associated with directing flow to the Middle Spring flume. Erosion and muskrat damage had cause it to be ineffective in that purpose. He took advantage of having the excavator close and cleaned out on both side of WCS 4 as well.

Volunteer Bill Wethington spent the second half of April hauling gravel to the Shoveler-Pintail dike.

Major repairs were made to both the back-up electrical generators in July. One of the generators had a plugged injector pump which was due from lack of use.

4. Equipment Utilization and Replacement

MM Layland plowed snow during January on the Pony Express Trail east of the refuge.

A new 1/3 yard concrete mixer was received during February. It replaces the refuge's 1963 Jaeger mixer.

The YSI conductivity meter was repaired in March due to a rusty transmission cable inside the plastic sheathing.

A 2004 Chevrolet Colorado was received in June. It will also be used as a law enforcement vehicle by the assistant manager.

Fig.24 The new Colorado truck was picked up in June.

A new double walled storage tank for our shop drain oil furnace was received during June.

Fig.25 The new concrete mixer and doubled-walled used oil tank.

5. Communication Systems

A new Nortel phone system was purchased for the refuge. The system was installed by Dugway personnel and the back-up systems will be stored at the Dugway Proving Ground.

6. Computer System

A all-in-one Fax/Copier/Printer was purchased with the SAMMS funding in February.

The new Dell computer hard drive was received back from the Regional Office with all the software installed.

AO Sims installed new ABC codes and time sheets for all staff.

A new computer was received in November from the Regional Office. The old system was replaced by the TRACKIT software.

AO Sims serves as the refuge's computer specialist and is called upon daily to fix and render assistance to staff.

J. OTHER ITEMS

4. Credits

This document was prepared by ARM Carpenter and AO Sims. Volunteers Steve and Caryl Barron and RM Banta proof read the document.

Pictures were taken by ARM Carpenter, AO Sims, MM Layland, Jim Graham, and Deborah Goeb.