6.0 NONRADIOLOGICAL ENVIRONMENTAL PROGRAMS

The 2000 nonradiological monitoring program for the Nevada Test Site (NTS) included onsite sampling of various environmental media and substances for compliance with federal and state regulations or permits and for ecological studies. The Ecological Monitoring and Compliance (EMAC) program performed habitat mapping in northern NTS areas, characterized springs, monitored man-made water sources, conducted wild horse surveys, and prepared a biological monitoring plan for the Hazardous Materials Spill center (HSC). In 2000, nonradiological monitoring was performed for four series of test involving 24 chemicals that were at the HSC.

6.1 WATER SURVEILLANCE

SAFE DRINKING WATER ACT (SDWA)

Four public water system permits are maintained on the NTS (see Table 3.4). Until September 2000, three water hauling permits for potable water were also maintained. In September 2000, the U. S. Department of Energy National Nuclear Security Administration/Nevada Operations Office (NNSA/NV) only renewed two of those permits (see Table 3.4). All other water systems on the NTS are considered private water systems and are operated outside of the scope of state and federal regulation.

In 2000, water sampling was conducted for analysis of coliform bacteria, lead, copper, nitrates, fluoride, and radionulcides as required by the SDWA, state of Nevada regulations, and the NTS Contaminant Monitoring Waivers. Samples were collected from supply wells for nitrates, fluoride, and radionuclides and from taps within the drinking water distribution systems for coliform bacteria, lead and copper. All samples were collected in accordance with accepted practices, and the analyses were performed by state-approved laboratories. Approved analytical methods listed in Nevada Administrative Code (NAC) 445A (NAC 1996) and Title 40 Code of Federal Regulations (CFR) 141 were used.

Bacteriological Sampling

All water distribution systems were tested either monthly or quarterly for coliform bacteria, with the number of people being served determining the number of samples collected and the frequency (see Table 6.1). If coliform bacteria are present, confirmation samples are collected, and the source of contamination is determined by the water system operator. There were no incidents of positive coliform results in NTS distribution systems in 2000.

Samples from permitted water hauling trucks were analyzed monthly for coliform bacteria. One sample tested positive. The truck was rinsed and disinfected prior to resampling. The resampling showed no coliform bacteria. It was determined that lack of adequate flushing before sample collection caused the positive result.

Organic Compound Analysis

In accordance with the monitoring waivers issued in 1996, the NNSA/NV did not collect Volatile Organic Compound samples in 2000.

Metal Analysis

Samples were collected from taps in the Area 12 public water system (NY-4099-12C) in the third and fourth quarters and analyzed for lead and copper. All results were below the action level of 1.3 mg/L for copper. Lead results, however, exceeded the 0.015 mg/L action level for lead. The samples were collected from the only building in Area 12 that was regularly used during this period, the Miners' Change House (Building 12-43), and from a hose connection outside this building. Lead solder is the suspected to be the cause of the high action level for lead. The NNSA/NV is in the process of determining a remedy for this situation, but in the interim, the water is only being used for non-consumption purposes. Water for drinking is supplied from a lead-free source.

Reduced monitoring for lead and copper is in effect in two of the other water systems (NY-0360-12C and NY-4098-12NTNC), and the Area 1 system (NY-5024-12NTNC) no longer has any active service connections.

Other Inorganic Chemical Analysis

To comply with a 1991 variance to the Area 25 water system permit, fluoride samples are collected annually from the two wells in Area 25 (NY-4098-12NTNC) before July 31 to confirm that the fluoride concentration is less than four parts per million. Samples taken from Area 25 Wells J-12 and J-13 in the first quarter of 2000 confirmed that the fluoride concentrations were acceptable.

During the first quarter of 2000, samples were collected from each supply well and analyzed for nitrates. All results were within acceptable limits.

The results of inorganic analyses are shown in Table 6.2.

Inspections

The Nevada Bureau of Health Protection Services performed a formal inspection of the permitted water hauling trucks and reported no findings or discrepancies. The NNSA/NV resolved the one remaining finding from a 1999 sanitary survey, a pinhole leak in a storage tank. The leak was successfully repaired in 2000.

6.2 AIR SURVEILLANCE

Air quality monitoring for the criteria pollutants is not required for the NTS. With the exception of the air permit for the HSC, the permits issued by the state of Nevada do require opacity and material throughput measurements. The HSC received a waiver by the state from adhering to opacity limits, due to the nature of its operations. Nonradiological monitoring is required by the HSC's air permit, and was conducted for four series of tests conducted at the HSC in 2000.

MONITORING OF NTS OPERATIONS

Routine nonradiological environmental monitoring on the NTS in 2000 was limited to the HSC air permit requirements and asbestos sampling in conjunction with asbestos removal and renovation projects and in accordance with occupational safety and National Emission Standards for Hazardous Air Pollutants compliance.

The HSC was established in Frenchman Flat in Area 5 as a basic research tool for studying the dynamics of accidental releases of various hazardous materials and the effectiveness of mitigation procedures. In addition to state of Nevada air permit monitoring requirements, offsite monitoring of HSC tests may be required by the U.S. Environmental Protection Agency (EPA). Prior to each HSC test series, and, at other tests in the series depending on projected need, the documentation describing the tests are reviewed by the EPA to determine whether appropriate air sampling equipment should be deployed downwind of the test at the NTS boundary to measure chemical concentrations that may have reached the offsite area. During 2000, no monitoring was required.

6.3 ECOLOGICAL MONITORING

The ecological monitoring tasks conducted under the EMAC program in 2000 included habitat mapping, monitoring of special interest plants and wildlife, monitoring wetlands and wildlife water sources, and review of test plans for experiments conducted at the HSC to determine if biological monitoring was needed.

HABITAT MAPPING

Work was initiated in 1996 to map plant and wildlife habitats of the NTS. Over the last four years, Ecological Landform Units (ELUs) were identified in the field (Bechtel Nevada [BN] 1998) and vegetation data were collected within representative ELUs, analyzed to classify plant communities, and then converted to geographic data to produce a plant habitat map of the entire NTS (BN 1998). Also, geographic information system (GIS) databases of each mapped plant community and of historic and current wildlife data were developed for linkage with geographic maps of the NTS. Work in calendar year (CY) 2000 focused on summarizing and documenting all vegetation and wildlife data collected or archived. In CY 2000, the draft report Classification of Vegetation on the Nevada Test Site was completed and submitted to the NNSA/NV for review (Ostler *et al.*, 2000) . This report will be published and distributed in CY 2001.

The NTS plant habitat data and GIS coverages were provided in CY 2000 to government and state agencies including the U.S. Fish and Wildlife Service (USFWS), Nevada Natural Heritage Program, Desert Research Institute, state of Utah Department of Natural Resources, Utah State University, Pacific Northwest National Laboratory, University of Wyoming, and The Nature Conservancy. BN biologists assisted researchers from the U.S. Geological Survey Biological Services in accessing some of the NTS vegetation study plots sampled in the 1970s. Photographs and field data were taken at the study plots which indicated that significant changes to plant species and community composition had occurred in the past 30 years. Studies will be useful to document changes due to climatic shifts (e.g., global warming) and direct and indirect effects of nuclear testing.

Cost-effective remote-sensing techniques, which could be used to monitor changes in NTS shrubland alliances over time, continued to be evaluated in CY 2000 through cooperative research sponsored by the Strategic Environmental Research and Development Program (SERDP). The SERDP is jointly funded by the U.S. Department of Defense, DOE, and EPA. Aerial photographs taken at different altitudes over Frenchman Flat were analyzed with new software designed to estimate shrub cover and density, and the efficacy of the software was then evaluated. New IKONOS satellite images with 1-m^2 pixel size were also analyzed with the same software. Such technology is expected to be incorporated into long-term habitat monitoring of the NTS.

SENSITIVE SPECIES MONITORING

There are 26 species which occur on the NTS that are considered sensitive because they are either (1) candidates for listing under the Endangered Species Act (ESA), (2) considered species of concern by the USFWS, (3) protected by other federal acts, or (4) state-managed species of public interest. The goal of sensitive species monitoring is to ensure their continued presence on the NTS by protecting them from significant impacts due to actions of the NNSA/NV. A secondary goal is to gather sufficient information on these species' distribution and abundance on the NTS to determine if further protection under state or federal law is necessary.

SENSITIVE PLANTS

Thirteen sensitive plant species are known to occur on the NTS. The NNSA/NV has funded efforts to collect data on the status of these plants and produced documents reporting their occurrence, distribution, and susceptibility to threats on the NTS (Anderson, 1998; Blomquist *et al*., 1995; Blomquist *et al*., 1992). In CY 2000, a long-term adaptive monitoring plan for all sensitive plants on the NTS was developed. The plan was submitted to the NNSA/NV for review in September (BN 2000) and will be implemented in CY 2001. The plan identifies the parameters which will be measured and the various adaptive management actions which may be taken if significant threats to the plants are detected.

The number of sensitive plant populations included in the monitoring plan are shown in Table 6.3. Two sensitive species which occur near the southern border of the NTS (*Penstemon albomarginatus* [White-margined beardtongue] and *Penstemon fruticiformis* var. *amargosae* [Death Valley beardtongue]) are not listed in Table 6.3 and are not included in the monitoring plan. They would be monitored if new populations were found on the NTS.

Monitoring will consist of two activities: preactivity surveys at new project sites and periodic field monitoring of known sensitive plant locations. Preactivity surveys are conducted to assess the direct impacts of land disturbance, and periodic monitoring of plant locations will be conducted to assess other indirect impacts. Periodic field monitoring will involve visiting each known location in a single season at least once every five years for those species which have limited numbers (<10) of known locations (Table 6.3). For species with larger numbers of known locations, a sub-sample of five to ten locations will be monitored in a single season at least once every five years. For each species, the five to ten locations chosen to sample may not be the same from sampling period to sampling period, and some locations may never be routinely sampled. The intent is to sample locations where direct effects of NTS activities and other factors such as drought or grazing/predation can best be detected. If a single known plant population is found within a proposed project site, or is observed during periodic field monitoring to be significantly impacted by a disturbance, then site-specific management actions will be implemented.

WESTERN BURROWING OWL

The western burrowing owl (*Speotyto cunicularia*) is a species of concern which breeds on the NTS. This owl occurs in all three eco-regions of the NTS: the Great Basin Desert, Transition Zone, and the Mojave Desert. It occupies the burrows of predators (e.g., coyote, kit fox, badger) and desert tortoises, as well as man-made structures such as buried pipes. Collection of baseline data continued in CY 2000 to identify their distribution and abundance on the NTS.

Five new burrow sites were found this year, bringing the total number of known burrow sites to 69. Of the 69 known sites, 44 are in disturbed habitat (e.g., burrow is located in a roadside berm or a metal culvert) and 25 are in undisturbed habitat (Figure 6.1).

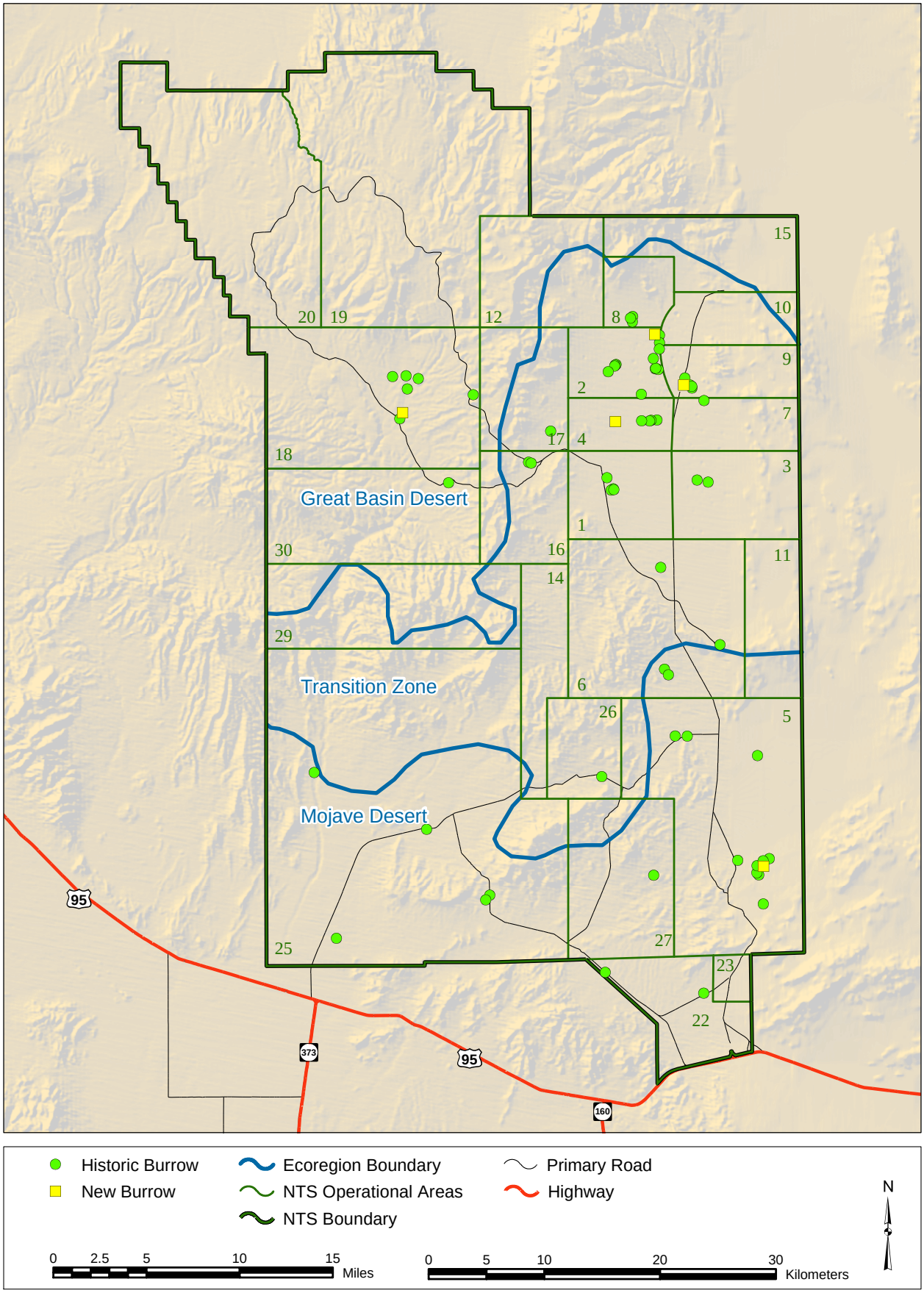

Figure 6.1 Location of Known Owl Burrows on the Nevada Test Site - 2000

Monthly monitoring of 59 of the 69 sites was conducted from October 1999 through September 2000, and the following conclusions may be drawn from the monitoring data:

- Fall migration of some owls off of the NTS probably occurs from October through January.
- Some owls reside year round in the Transition and Great Basin eco-regions.
- Owls are probably moving through the NTS on their northward spring migration from mid-March to early April.

An active infrared beam and camera system was used as a passive data collection method to record the presence of breeding owls and their young at selected burrows. It is important to know when burrowing owls breed and when young fledglings leave the nest. This information will help ensure that burrows are avoided and owls are unharmed during construction activities for new projects on the NTS. It is also important to document trends in owl populations over time to determine if this species is being affected by activities of the NNSA/NV. A good parameter to measure owl population trends is the annual number of breeding pairs.

Twenty-four burrow sites were monitored using the camera system between February and August. Forty-five young owls were detected from eight breeding pairs (Table 6.4). Thirty-four of the 45 young were from burrows in the Transition eco-region of the NTS. The largest number of young owls observed at a single nest was eight. The number of young detected this year nearly doubled the number detected last year (24). An average of 5.6 young per breeding pair was observed this year. Last year an average of 3.4 young per breeding pair was observed (BN 1998). The breeding period in CY 2000 appeared to be from early March through early September.

To develop reasonable mitigation recommendations for land-disturbing projects in burrowing owl habitat, it is important to know the level of disturbance owls tolerate without causing nest abandonment. Two methods were used this year to begin to determine this disturbance tolerance. One method involved setting traffic counters near active burrow nest sites and recording the number of vehicle passes and the distance from the nest burrow to the road. The second was measuring the distance at which owls flushed from observers as they approached the owl by foot and in a vehicle. Preliminary results show that owls can breed successfully with several vehicles per day passing within 14 to 165 meters (m) of a nest burrow. No correlation is evident between the number of vehicles per day or distance to road and the number of young observed. The average flushing distance while an observer was approaching a burrow on foot was 34 m (range 3 m to 80 m; [n=32]). The average flushing distance while an observer was approaching a burrow in a vehicle was 48 m (range 5 m to 135 m; [n=9]). Based on these data, it may be a reasonable mitigation recommendation for new construction projects to avoid active owl nests during the breeding season (March through September) by a minimum of 50 m.

BAT SPECIES OF CONCERN

To date, a total of 14 bat species has been documented on the NTS, of which 7 are species of concern. They are the Townsend's big-eared bat (*Corynorhinus townsendii*), spotted bat (*Euderma maculatum*), small-footed myotis (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), fringed myotis (*Myotis thysanodes*), the long-legged myotis (*Myotis volans*), and the big free-tailed bat (*Nyctinomops macrotis*).

Monitoring to identify the distribution of bat species of concern on the NTS continued this year. Seventy bats representing four species of concern were captured in mist-nets at water sources in the Great Basin Desert eco-region. No bat species of concern were captured in the other two eco-regions of the NTS (Mojave Desert, Transition Zone).

Mines and tunnels are important or even critical habitats for some bat species. These man-made excavations can be used as day and night roosts, maternity colonies, and hibernacula. To determine which NTS mines and tunnels are being used by which bat species, the Anabat II device (Titley Electronics, Ballina, Australia) was used in 1999 and 2000. This device records and analyzes ultrasonic bat vocalizations and it was set up outside selected mines/tunnels just prior to sunset. In 1999, the old Climax mine adit, the Mine Mountain adit and shafts, A Tunnel, B Tunnel, and N Tunnel complex were sampled. Recorded calls from these sites were analyzed in 2000. Four species of concern were found to be using the NTS tunnels. The 1999 recorded calls were identified as those of the small-footed myotis (A Tunnel), the long-eared myotis (A Tunnel), the fringed myotis (B Tunnel), and the long-legged myotis (B and N tunnels). The sites sampled in 2000 included the Wahmonie mine shaft, T Tunnel, E Tunnel, IJK Tunnel complex, A Tunnel, and B Tunnel. This year, bat calls were recorded at all of the mine/tunnel sites sampled except E Tunnel. Analysis of the recorded calls to identify species for 2000 is not yet completed.

WILD HORSES

Wild horses (*Equus caballus*) occur on the NTS, and ongoing monitoring of this species was conducted in 2000. Wild horses are protected on public lands under the Wild Free-Roaming Horse and Burro Act of 1971. This act calls for the management and protection of wild horses and burros in a manner that is designed to achieve and maintain a thriving natural ecological balance. Although the NTS is on land withdrawn from public use, the NNSA/NV is committed to this same management goal on the NTS. In 1997, the NNSA/NV signed a Five-Party Cooperative Agreement with Nellis Air Force Range (NAFR), USFWS, U.S. Bureau of Land Management, and the state of Nevada Clearinghouse. The goal of the agreement is to enhance management of the natural resources within ecosystems on the NAFR, the NTS, and the Desert National Wildlife Range. This agreement facilitates an ecosystem-based approach in the management of free-roaming animals with large home ranges, such as wild horses. BN conducts an annual horse census on the NTS. The NTS horse population has not increased in size over time as on the NAFR, and it appears to be isolated from the NAFR population. In the past five years, a decline in horse numbers on the NTS has been observed.

In 2000, BN biologists performed four tasks related to horse monitoring:

- Annual horse abundance was estimated to monitor population stability.
- Horse signs were recorded along selected roads to better define the geographic range of horses on the NTS.
- Selected natural and man-made water sources were visited in the summer to determine their influence on horse distribution and movements and to determine the impact horses are having on NTS wetlands.
- A monitoring plan for wild horses on the NTS was completed.

Since 1995, the feral horse population has declined 31 percent, from 54 to 37 horses (these counts exclude foals) (Table 6.5). Of the 23 horses which have been classified as missing since 1995, 12 were adult males, 9 were adult females, and 2 were yearlings of unknown sex. No foals observed in 1995 through 1998 survived to yearlings. The cause of the population decline appears to be (1) low recruitment due to very poor foal survival and (2) moderate adult mortality.

Horse sign data collected during the road surveys and surveys at natural and man-made water sources indicate that the 2000 NTS horse range includes Kawich Canyon, Gold Meadows, Yucca Flat, southwest foothills of the Eleana Range, and southeast Pahute Mesa (Figure 6.2).

At present, the NTS horse herd appears to consist of two groups, one larger group (about 24 horses) that spends summers west of the Eleana Range and one smaller group (12-13 horses) that spends summers east of the Eleana Range on Yucca Flat. These groups of horses probably intermix during the winter but the exact mixing areas are unknown. More information on winter range of horses needs to be developed in the future. Overall, the annual horse range appears to have changed very little from the previous year. However, the small group of 12-13 horses on Yucca Flat appear to be using a smaller forage area than in previous years. This is possibly due to the reduced number of water resources on northern Yucca Flat which probably limits the extent of their grazing range to the north.

The NTS horse population is dependent on several natural and man-made water sources in Areas 18, 12, and 30 (Figure 6.2) during different seasons. Wildhorse and Little Wildhorse seeps are important winter-spring water sources. Two natural water sources (Captain Jack Spring and Gold Meadows Spring) and one man-made pond (Camp 17 Pond) were used by horses in the summer, as in past years. Overall, Captain Jack Spring, Gold Meadows Spring, and Camp 17 Pond were the most important water sources for horses based on the presence and quantity of horse sign and trampled and grazed vegetation.

There are presently six man-made water sources within or on the edge of the annual horse range and none of them were used by horses in 2000. Only two of these sources are permanent (contain water year round). These are the E Tunnel Containment Ponds and the Area 12 Sewage Ponds. No horse sign have ever been found at these permanent man-made water sources.

The horse monitoring program was evaluated this year for its ability to determine if the NTS Resource Management Plan goals for horse protection are being met (DOE 1998a). As a result, a monitoring plan was developed and submitted to the NNSA/NV for review in September. The plan identifies desired minimum and maximum sizes of the NTS horse population and identifies possible adaptive management actions which may be taken if these sizes are reached. If the horse population continues to decline, the plan calls for studies to be developed and implemented to determine the cause(s). Because horses are not native to the NTS, there are currently no proposed management actions to increase the herd size.

RAPTORS

Several raptors occur and breed on the NTS which are not protected under the ESA and are not species of concern. They are, however, protected by the federal government under the Migratory Bird Treaty Act and by the state of Nevada. Raptors include all vultures, hawks, kites, eagles, ospreys, falcons, and owls. Because these birds occupy high trophic levels of the food chain, they are regarded as sensitive indicators of ecosystem stability and health. There are eight raptors (Table 6.6) which are known to breed on the NTS (Greger and Romney, 1994); however, only a few records exist, of breeding raptors on the NTS or of their reproductive

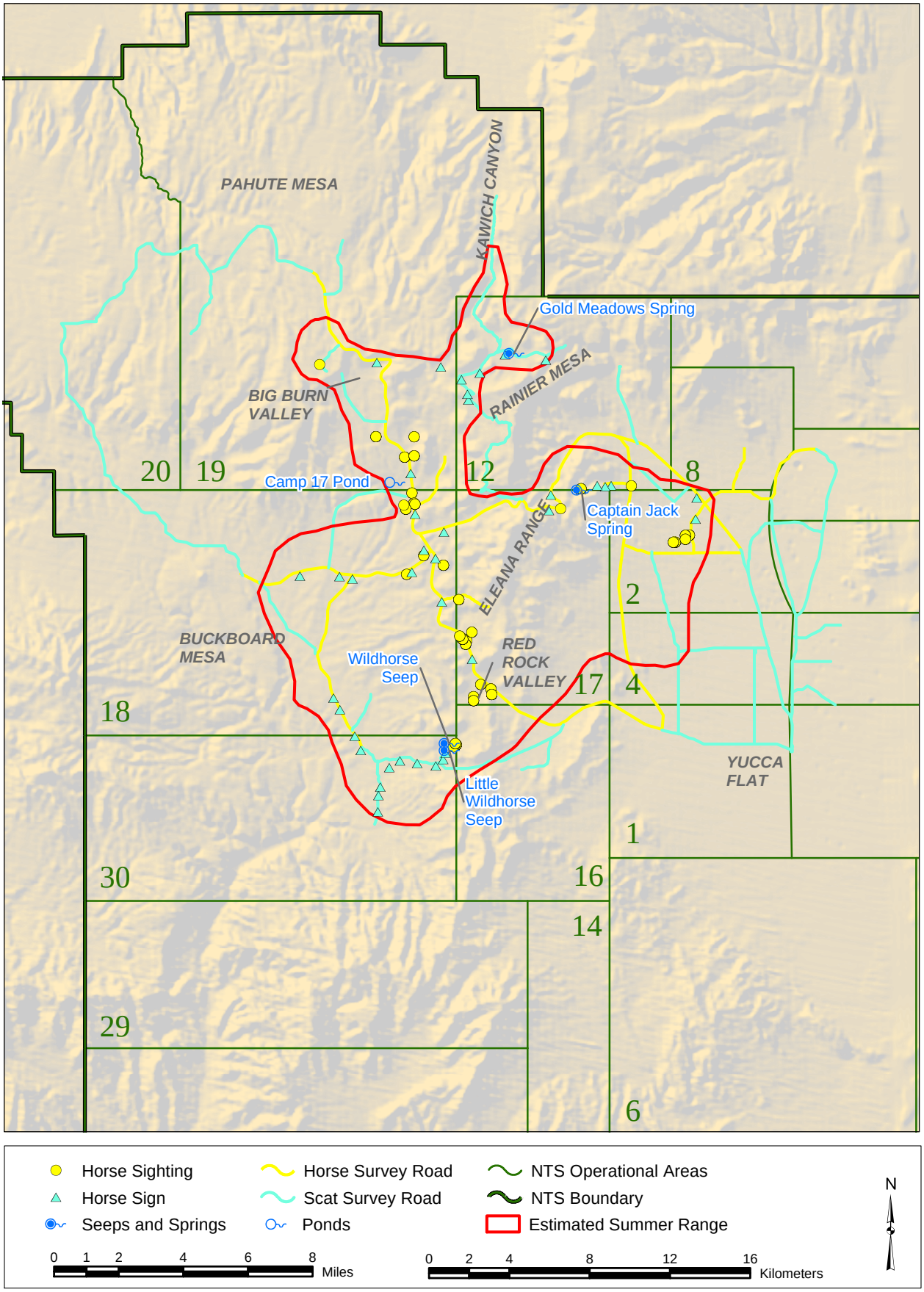

Figure 6.2 Feral Horse Sightings and Horse Sign Observed on the Nevada Test Site - 2000

success, egg incubation periods, and fledging times (time when young leave the nest). Surveys to locate raptor nests and the number of breeding pairs of raptors began on the NTS in 1998 and were continued in 2000.

From April through July 2000, the following regions were surveyed: Yucca Flat, Horse Wash, Oak Spring Butte, Buckboard Mesa, Rainier Mesa, lower Stockade Wash, North Shoshone Mountain, and the Tippipah Spring area. Also, nineteen known nests were revisited to check for reproduction.

Four new red-tailed hawk nests were detected during ground searches (Figure 6.3). Six active raptor nests were detected this year. All six were those of red-tailed hawks. They included a microwave tower nest, two power line pole nests, a willow tree nest, a Joshua tree nest, and a cliff nest. The number of red-tailed hawk active nests and nestlings observed this year was more than last year. The total number of nestlings and number of active nests (Table 6.7) was lower in both 1999 and 2000 (dry years) compared to 1998 (a wet year).

Although monitoring has only occurred for three years, it appears that the reuse of existing nests is not common on the NTS. Only 1 of 10 (10 percent) raptor nests known in 1998 were reused in 1999, and only 2 of 15 (13 percent) raptor nests known in 1999 were reused in 2000.

Few raptor mortalities have been recorded at the NTS. Wildlife observations, made opportunistically by BN biologists and other NTS workers, are maintained by BN biologists in a computerized database. Accounts of injured and dead animals are also usually reported to BN biologists and are stored in the same database. Over the last 10 years, from 1990-2000, 16 incidents of dead raptors have been recorded on the NTS. The known causes of death include seven roadkills, two electrocutions, two predator kills, and two drownings (Table 6.8).

MONITORING NATURAL WATER SOURCES

Natural wetlands and man-made water sources on the NTS provide unique habitats for mesic and aquatic plants and animals and attract a variety of other wildlife. Natural NTS wetlands may qualify as jurisdictional wetlands under the Clean Water Act (CWA). Characterization of these mesic habitats to determine their status under the CWA and periodic monitoring of their hydrologic and biotic parameters are components of the Ecological Monitoring program which was started in 1997. Periodic wetlands monitoring may help identify annual fluctuations in measured parameters that are natural and unrelated to activities of the NNSA/NV. Also, if a spring classified as a jurisdictional wetland was unavoidably impacted by a NNSA/NV project, mitigation for the loss of wetland habitat would be required under the CWA. Under these circumstances, wetland hydrology, habitat quality, and wildlife usage data collected at the impacted spring over several previous years can help to develop a viable mitigation plan and demonstrate successful wetland mitigation.

Monitoring of selected NTS wetlands was continued this year to characterize seasonal trends in physical and biological parameters. Fourteen wetlands were visited at least once to record the presence/absence of land disturbance, water flow rates, and surface area of standing water (Table 6.9). Observations at Pahute Mesa Pond in the spring confirmed that field indicators were present for vegetation, hydrology, and soils, and it was concluded that the lower one-half of the pond was considered to have jurisdictional status as a wetland. No jurisdictional or nonjurisdictional wetlands on the NTS were disturbed during 2000 and no U.S. Army Corps of Engineers 404 Permit was required.

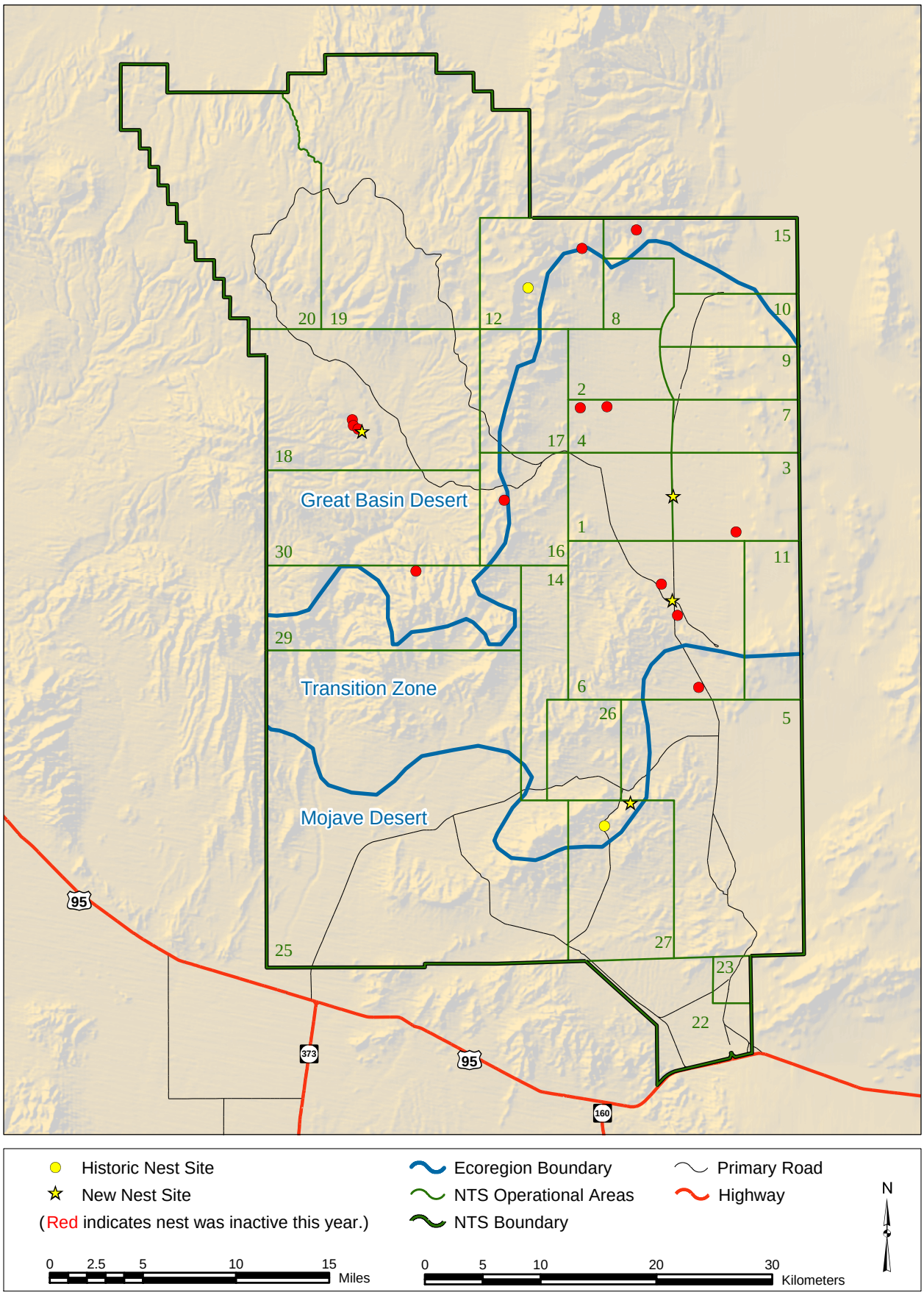

Figure 6.3 Location of Known Raptor Nests on the Nevada Test Site - 2000

Wildlife and wildlife sign observed during visits to NTS wetlands were recorded. Four species of mammals and 17 species of birds were detected . The most widely distributed mammal species were coyote and mule deer, observed at 12 and 11 of the 14 sites, respectively. Horses and mountain lion were the other mammals observed. Mourning dove, chukar, and Gambel's quail were the most widely distributed bird species observed and were also the most abundant.

MONITORING MAN-MADE WATER SOURCES

Man-made excavations constructed to contain water occur throughout the NTS. Like natural water sources, they too can affect the movement patterns of some species (e.g., wild horses). However, they can also cause accidental wildlife mortalities from entrapment and drowning if not properly constructed or maintained. Quarterly monitoring of man-made water sources was conducted in 2000. These sources, located throughout the NTS, included 35 plastic-lined sumps, 39 sewage treatment ponds, 13 unlined well ponds, and 4 radioactive containment ponds. They are monitored to assess their use by wildlife and to develop and implement mitigation measures to make them safer for use by wildlife. Mitigation measures, required under the Mitigation Action Plan for the Final Environmental Impact Statement (DOE 1996c), include placing flag lines over contaminated water sources to repel birds, or fencing or covering them. Quarterly monitoring ensures that all flag lines, fencing, or covers are checked for their integrity and repaired when needed.

Man-made water sources were visited during four quarterly sampling periods; November, February, May and August 2000 . Use of unlined sumps and ponds by waterfowl (ducks, shorebirds), passerine birds (ravens, horned larks, house finches), and mammals such as coyotes and deer was common. The fences installed around the plastic-lined sumps do not exclude coyotes or deer, as their tracks were observed commonly inside many of the fences. Birds were observed much less at the plastic-lined sumps compared to the unlined ponds.

No dead animals were recorded in any plastic sumps during fiscal year (FY) 2000. A sediment mound was constructed in Sump # 3 at ER-20-6 in 2000 to prevent deer drownings. This sediment ramp appears to be working well as deer sign have been recorded at this site, yet no additional deer drownings have occurred. No functional flaglines have been present at any plastic-lined ponds on the NTS for the last three years. No mortality of birds have occurred in these sumps, however, since the flaglines have been absent. This indicates that flaglines presently are not necessary to prevent bird mortality. Flagline conditions will not be monitored in the future unless conditions require their reinstallation.

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Table 6.1 Frequency of Coliform Bacteria Monitoring for NTS Public Water Systems

Public Water System	Monitoring Frequency
NY-0360-12C	Monthly - 3 Samples
NY-4098-12NTNC	Quarterly - 1 Sample
NY-4099-12C	Monthly - 1 Sample
NY-5024-12NTNC	Quarterly - 1 Sample
NY-0835-12H	Monthly - 1 Sample
NY-0836-12H	Monthly - 1 Sample

Table 6.2 Analyses of Well Water Samples - 2000

Water System/Well	Nitrates (MCL[c] 10 ppm[a])	Fluoride (MCL 4 ppm)	Lead (action level .015 ppm)
NY-0360-12C			
Army Well	(b)		
Well 5B	2.8		
Well 5C	1.8		
Well 4	3.5		
Well 4A	4.0		
Well C-1	(b)		
NY-4098-12NCN			
Well J-12	2.1	1.7	
Well J-13	2.2	2.0	
NY-4099-12C			.026
Well 8	1.3		
NY-5024-12NCN			
Well UE16d	(b)		

(a) Parts per million.
(b) Not detected.
(c) Maximum contaminant level.

Table 6.3 Number of known Locations of Sensitive Plants on the NTS

Plant Species	Number of Known Locations
Arctomecon merriamii	17
Astragalus beatleyae	33
Astragalus funereus	9
Astragalus oophorus var. *clokeyanus*	22
Camissonia megalantha	11
Cymopterus ripleyi var. *saniculoides*	18
Frasera pahutensis	9
Galium hilendiae ssp. *kingstonense*	5
Penstemon pahutensis	88
Phacelia beatleyae	41
Phacelia parishii	32

Table 6.4 Summary of Burrow use by Pairs of Owls on the NTS - FY 2000

Eco-region	Sites Surveyed	Burrows With Non-breeding Pairs	Burrows With Breeding Pairs	Juvenile Owls
Mojave Desert	7	1	1	3
Transition	13	2	6	34 (4--7/burrow)
Great Basin Desert	4	0	1	8
Totals	**24**	**3**	**8**	**45**

Table 6.5 Number of Horse Observed on the NTS by Age Class, Gender, and Year Since 1995

Age Class	Number of Horses Observed											
	1995		1996		1997		1998		1999		2000	
Foals	1		1		3		8		5		11	
Yearlings	3		0		0		0		0		4	
Adults	M	F	M	F	M	F	M	F	M	F	M	F
2 Year Olds	0	0	0	1	0	0	0	0	0	0	(2)	0
3 Year Olds	0	0	0	0	0	1	0	0	0	0	0	0
> 3 Years Old	22	29	21	24	19	20	16	21	11	20	12	21
Total	**54**		**46**		**40**		**37**		**31**		**37**	

Note: (M=male; F=female)

Table 6.6 Raptor Species that Occur and Breed on the NTS

Raptor Species	Common Name
Aquila chrysaetos	Golden eagle
Asio otus	Long-eared owl
Buteo jamaicensis	Red-tailed hawk
Buteo swainsoni	Swainson's hawk
Falco mexicanus	Prairie falcon
Falco sparverius	American kestrel
Speotyto cuniculaia	Western burrowing owl
Tyto alba	Barn owl

Table 6.7 Summary of Raptor Reproduction Observed on the NTS

	Number of Active Nests			Number of Young Observed		
Species	FY 1998	FY 1999	FY 2000	FY 1998	FY 1999	FY 2000
Golden eagle	1	2	0	1	2	0
Prairie falcon	1	0	0	5	0	0
Red-tailed hawk	7	4	6	10	2	10
Swainson's	1	0	0	2	0	0
Totals	**10**	**6**	**6**	**18**	**4**	**10**

Table 6.8 Summary of NTS Raptor Mortality Records from 1990-2000

Species	Roadkill	Electrocution	Suspected Drowning	Predation	Unknown	Totals
American kestrel				1	1	**2**
Barn owl	1				1	**2**
Golden eagle	1	1				**2**
Great-horned owl	3					**3**
Prairie falcon				1		**1**
Red-tailed hawk	2	1	1			**4**
Turkey vulture					1	**1**
Western burrowing owl			1			**1**
Totals	**7**	**2**	**2**	**2**	**3**	**16**

Table 6.9 Seasonal Data from Selected Natural Water Sources on the NTS Collected During FY 2000

Water Source	Date	Surface Area of Water (m^2)[a]	Surface Flow Rate (L/Min)[b]	Disturbance at Spring
Cane Spring	5/10	15	2.4	None
Cane Spring	8/31	9	2.4	None
Captain Jack Spring	5/3	40	2	None
Captain Jack Spring	7/27	40	1.1	Horse grazing and trampling
Gold Meadows Spring	5/2	600	0	Horse grazing and trampling
Gold Meadows Spring	8/15	0	0	Horse grazing and trampling
Little Wildhorse Seep	4/27	18	NM	Horse grazing and trampling
Little Wildhorse Seep	7/20	0	0	None
Pahute Mesa Pond	6/13	0	0	None
Reitmann Seep	5/24	0.04	0	None
Reitmann Seep	9/14	0.03	0	None
Tippipah Spring	5/4	440	3.6	None
Tippipah Spring	8/31	290	1.2	None
Topopah Spring	8/10	1.5	0.5	None
Wahmonie Seep No. 1	6/26	0	0	None
Wahmonie Seep No. 2	6/26	0	0	None
Wahmonie Seep No. 3	6/26	0	0	None
Wahmonie Seep No. 4	6/26	2	NM	None
Whiterock Spring	5/17	70	2.7	None
Whiterock Spring	9/13	60	3	None
Wildhorse Seep	4/27	45	NM	Horse grazing and trampling
Wildhorse Seep	7/20	0	0	None

Table 6.10 NTS Drinking Water Permits - 2000

Permit No.	Area(s)	Expiration Date	Reporting Required
NY-360-12C	Area 5, 6, 22, 23	09/30/2001	(a)
NY-4098-12NTNC	Area 25	09/30/2001	(a)
NY-4099-12C	Area 2 & 12	09/30/2001	(a)
NY-5024-12NTNC	Area 1	09/30/2001	(a)
NY-835-12H	Sitewide - Truck	09/30/2001	(a)
NY-836-12H	Sitewide - Truck	09/30/2001	(a)

(a) Monitoring is reported within 10 days after each monitoring period.

U12N Overview of All Ponds from the Top of Muck Pile (March 13, 1989)