BIOLOGICAL ASSESSMENT

FOR THE EFFECTS OF

NATIONAL NUCLEAR SECURITY ADMINISTRATION

ACTIVITIES AT THE NEVADA TEST SITE

ON THE DESERT TORTOISE

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TABLE OF CONTENTS

Section Title Page

1.0 Introduction 1
1.1 Purpose and Need 1
1.2 Scope and Objectives 2

2.0 Environmental Setting 3
2.1 General Description 3
2.2 Biological Resources 3

3.0 Relative Abundance and Distribution of Desert Tortoises 6
3.1 Relative Abundance 6
3.2 Distribution 7
3.3 Critical Habitat 8

4.0 Description of Programs 9
4.1 Programs 9
4.2 New Program Updates 9
4.2.1 Defense Programs Facilities and Activities since NTS EIS 10
4.2.2 Waste Management Facilities and Activities since the NTS EIS 12
4.2.3 Environmental Restoration Program since the NTS EIS 13
4.2.4 Nondefense Research and Development Program Activities since the NTS EIS 14
4.2.5 Work-for-Others Activities and Facilities Identified since NTS EIS 14

5.0 Possible Effects on the Desert Tortoise 16
5.1 Potential Direct Negative Effects 16
5.1.1 Mortality by Vehicles 16
5.1.2 Mortality from Construction Activities 16
5.2 Potential Indirect Negative Effects 16
5.2.1 Habitat Loss 16
5.2.2 Human Disturbances 17
5.3 Potential Beneficial Effects 17
5.4 Cumulative Effects 17

6.0 Mitigation Actions 18
6.1 General Desert Tortoise Mitigation Actions 18
6.1.1 Project Review and Preactivity Survey 18
6.1.2 Environmental Monitor Present during Construction 18
6.1.3 Employee Education 18

6.1.4 On-Call Biologist 18
6.1.5 Prohibition of Off-Road Vehicle Travel 19
6.1.6 Establishment of Speed Limits 19
6.1.7 Litter Control Program.....19
6.2 Site-Specific Desert Tortoise Mitigation Actions.....19
6.2.1 Habitat Reclamation.....19

7.0 Significance 20

8.0 Literature Cited 21

LIST OF FIGURES

Figure	Title	Page
1	Distribution of desert tortoises on the Nevada Test Site	4
2	Tortoise abundance of the Nevada Test Site	7

LIST OF TABLES

Table	Title	Page
1	Relationship of sign detected per kilometer of transect walked to categories of abundance of desert tortoises (from Karl, 1981)	6

1.0 INTRODUCTION

Since the establishment of the Nevada Test Site (NTS), the principle mission of the Department of Energy (DOE), National Nuclear Security Administration Nevada Site Office (NNSA/NSO) has been to conduct nuclear tests. Since the current moratorium on testing began in October 1992, this mission changed to maintaining a readiness to conduct tests, if so directed, in the future. Because of its favorable environment and infrastructure, the NTS has also supported DOE waste management and other national-security-related research, development, and testing programs. This Biological Assessment (BA) focuses on the five strategic program areas of activities on the NTS; Defense, Waste Management, Environmental Restoration, Non-Defense Research and Development, and Work for Others.

The threatened desert tortoise *(Gopherus agassizii)* is the only listed species that resides on the NTS. In addition, there are no candidate species for federal listing that occur on the NTS. Planned activities on the NTS for the next ten years have been evaluated in terms of their impact on this species to comply with the National Environmental Policy Act (NEPA) and with the Endangered Species Act (ESA). Results of these analyses indicate that the desert tortoise may be susceptible to incidental take from NNSA/NSO operations. NNSA/NSO is therefore obligated under Section 7(a)(2) of the ESA to initiate formal consultations with the U.S. Fish and Wildlife Service (FWS) to obtain an incidental take provision for activities described in this BA.

A BA was prepared in July 1991 to obtain a desert tortoise incidental take provision for NNSA/NSO activities at the NTS planned for fiscal years 1991 through 1995 (DOE, 1991). In May, 1992 FWS prepared a Biological Opinion (Opinion) concerning those activities (FWS, 1992, File No. 1-5-91-F-225). In 1996, NNSA/NSO issued *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada* (DOE, 1996; DOE/EIS-0243) (NTS EIS). A second BA, based on the NTS EIS that described programs, projects, and other activities that were anticipated to occur between 1996 and 2006 was prepared and submitted to FWS. An Opinion was issued by the FWS for these activities in 1996 (FWS, 1996, File No 1-5-96-F-33). Since 1996, two other Opinions were issued by FWS for activities that were outside the scope of the 1996 Opinion. The first, *Biological Opinion for the Proposed Chemical Release Tests at the Nevada Test Site, Nye County, Nevada*, was issued in 2005. The second, *Biological Opinion for Proposed Activities at the Device Assembly Facility, Nevada Test Site, Nye County, Nevada*, was issued in 2007.

1.1 PURPOSE AND NEED

The purpose of this BA is to present potential impacts to the desert tortoise resulting from NNSA/NSO activities at the NTS for the next five years identified in the *Supplement Analysis for the Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada* (DOE, 2008; DOE/EIS-0243-SA-03) (Supplement Analysis). Submission of this information is needed to satisfy formal consultation requirements for FWS to complete a Biological Opinion.

1.2 SCOPE AND OBJECTIVES

This BA will address potential impacts of NNSA/NSO activities that will occur, or may occur, in all areas of desert tortoise habitat on the NTS. This BA does not assess impacts on desert tortoises at other NNSA locations in Nevada.

This BA, like the one prepared in 1995 for NTS activities, describes specific ongoing activities. General and site-specific mitigation actions are presented which will provide protection for the desert tortoise. The specific objectives of this BA are to:

- Provide background information on the distribution and relative abundance of the desert tortoise on NTS. Most information will be provided by reference to existing documents which have been previously submitted to FWS.

- Present a description of proposed NNSA/NSO actions from the Supplement Analysis that may affect the desert tortoise.

- Present NNSA/NSO mitigation plans to eliminate, reduce, or compensate for negative impacts to the desert tortoise and its habitat.

2.0 ENVIRONMENTAL SETTING

2.1 GENERAL DESCRIPTION

The NTS occupies 3,561 km^2 (1,375 mi^2) of land in southern Nye County, Nevada, making it one of the largest restricted access areas in the United States. The NTS is surrounded on three sides by about 16,800 square kilometers (6,500 square miles) of additional land withdrawn from the public domain for the U.S. Air Force's Nevada Test and Training Range (formerly the Nellis Air Force Range) (an area for armament and high hazard testing; aerial gunnery, rocketry, electronic warfare, and tactical maneuvering training; and equipment and tactics development and training), and the Desert National Wildlife Refuge. (The airspace above the Refuge is shared with the Nevada Test and Training Range.) On the south the NTS is bordered by lands administered by the U.S. Bureau of Land Management (BLM). The NTS is located 105 km (65 mi) northwest of Las Vegas, Nevada (Figure 1). The NTS has been used for underground nuclear testing and for testing the effects of nuclear weapons on military communications systems, electronics, satellites, sensors, and other materials. Other federal agencies have conducted many other activities on the NTS. It is estimated, based on 1990 satellite imagery, that approximately 237 km^2 (91.5 mi^2) of land on the NTS has been previously disturbed (Wills and Ostler, 2001). This represents about 6.8 percent of the total area of the NTS. The area where activities may impact desert tortoises are in the southern one-third of the NTS in Areas 5, 6, 14, 22, 23, 25, 26, 27, and 29 (Figure 1).

2.2 BIOLOGICAL RESOURCES

The operational areas which are occupied by desert tortoises and covered by this BA occur in the Mojave Desert portion of the NTS. The NTS consists of broad valleys surrounded by low mesas or mountains. The climate is hot and dry with moderately cold winters. The dominant vegetation types occurring on the NTS are described by Ostler et al. (2000) and Wills and Ostler (2001). The southern areas of the NTS that are occupied by desert tortoises are dominated by creosotebush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), and blackbrush (*Coleogyne ramosissima*) (Beatley, 1976; Ostler et al, 2000). The biota of the NTS is well documented (Allred et al., 1963; Hayward et al., 1963; Tanner and Jorgensen, 1963; Jorgensen and Hayward, 1965; Wills and Ostler, 2001) and is composed of species from the Great Basin and Mojave deserts. The endangered peregrine falcon and the threatened bald eagle have each been sighted only once on the NTS (Castetter and Hill, 1979; Greger and Romney, 1994). There have been no recent sightings of either of these species. The only listed species that resides on NTS is the desert tortoise (DOE, 1996). Desert tortoises are uncommon but can be found in the Mojave Desert plant communities in the southern third of the NTS. No threatened or endangered plants are known to occur on NTS (FWS, 1995; FWS, 2000).

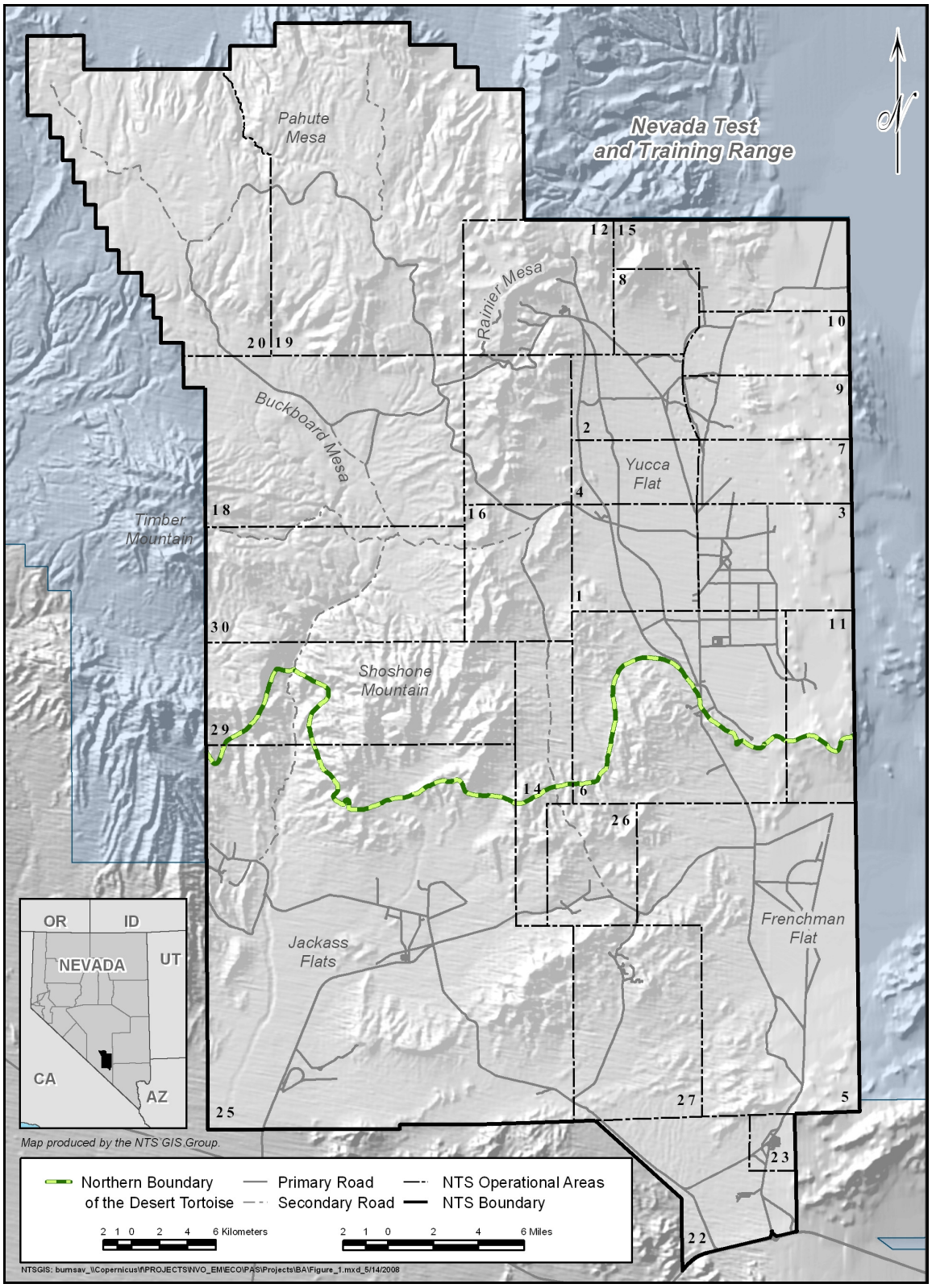

Figure 1. Desert tortoise habitat on the Nevada Test Site.

There are many plant and animal species found on the NTS that are protected/regulated by the State of Nevada or are listed as sensitive species by the Nevada Natural Heritage Program (2007) (Appendix 1). Only two animals are common, the chuckwalla and western burrowing owl. Chuckwallas are found on rocky outcrops in the southern half of the NTS (Tanner and Jorgensen, 1963) and western burrowing owls are residents throughout the region (Hayward et al., 1963). Four former candidate species of bats (spotted bat, fringed myotis, long-eared myotis, and long-legged myotis) were known to occur on the NTS in 1993 (Rakestraw et al, 1998). Two other candidate bat species, the small-footed myotis and Townsend's big-eared bat, were found on the NTS in more extensive surveys for bats in 1996 and 1998 (Steen et al, 1997; Bechtel Nevada, 1999). None of these bat species of concern are reported from the Mojave Desert portion of the NTS.

3.0 ABUNDANCE AND DISTRIBUTION OF DESERT TORTOISES

A detailed description of the distribution and abundance of desert tortoises on the NTS is given in the *Biological Assessment of the Effects of the U.S. Department of Energy Field Office, Nevada, on the Threatened Desert Tortoise* (DOE, 1991), and the *Distribution and Abundance of Desert Tortoises on the Nevada Test Site* (EG&G/EM, 1991).

3.1 RELATIVE ABUNDANCE

In 1996 the relative abundance of desert tortoises was measured within selected Ecological Landform Units (ELU) by walking tortoise sign-survey transects using the methods of Berry and Nicholson (1984). The transect technique has been used to determine the relative abundance of desert tortoise throughout the range of this species in the United States (Luckenbach,1982; Karl, 1980; Berry, 1986). An ELU is an area with similar vegetation, slope, aspect, and soils. Two hundred and six ELUs were surveyed for desert tortoises within desert tortoise habitat previously characterized as unknown in the 1996 Opinion (FWS 1996). Transects lengths were adjusted to reflect sampling two percent of the area within each ELU (Woodward, 1998). Transects were 10 m (33 ft) wide, thus 1 hectare (ha) (2.5 acre [ac]) was sampled for each 1 km (0.6 mile [mi]) walked. The locations and shape of transects were determined subjectively to include as much of each ELU as possible. Most transects were divided into segments that formed a closed triangle allowing the observer to start and end at the same point which enhanced sampling efficiency. A total of 332 transects were walked totaling 889 km (552 mi). Two hundred and eighty one signs were counted: 246 burrows, 14 scat, 12 carcasses, seven tortoises and two egg fragments. An average of 0.32 sign was found per km walked. This was the exact same value as the average amount of sign found on the 1,191 km (740 mi) of transects walked in the 1980s (EG&G/EM, 1991). Tortoise sign found was recorded and a classification of abundance was calculated for all transects surveyed using a relationship of sign and density of tortoises described by Karl (1981) (Table 1.).

Table 1. Relationship of sign detected per kilometer of transect walked to categories of abundance of desert tortoises (from Karl, 1981)

Sign Detected/km Transect	Abundance Class	Tortoises/km^2	Tortoises/mile^2
<0.4	Very Low or None	0-3.9	0-10
0.4-1.49	Low	3.9-17.4	10-45
1.5-2.99	Moderate	17.4-34.7	45-90
3.0-5.0	Moderately High	34.7-54.0	90-140
>5.0	High	>54.0	>140

ELUs on the NTS were classified as having a desert tortoise abundance ranging from very low or none (0-3.9 tortoises per km^2) to moderate (17.4-34.7 tortoises per km^2) (Figure 2). The average sign for all transects sampled during the 1996 study was 0.32 per km with a rating of very low or none (Karl, 1981). More than 68 percent of the area sampled (140 ELUs) had less than 0.4 sign found per km. Thirty-one percent of the area (63 ELUs) had from 0.4 to 1.49 sign per km (low

classification) and only one percent of the area (3 ELUs) had more than 1.5 sign found per km (moderate classification). Based on all previous transect studies on the NTS the relative abundance of desert tortoises is generally very low.

In 1993, the density of tortoises on the NTS was sampled on three 1- km^2 (0.39-mi^2) plots designed according to the guidelines described in Appendix A of the Draft Recovery Plan for the Desert Tortoise (Mojave Population) (FWS, 1993). Six tortoises were found within these plots; two in one plot and four in another (Mueller and Zander, 1994). Only one live tortoise has been observed during clearance surveys for construction projects in fiscal years 1993 through 2007.

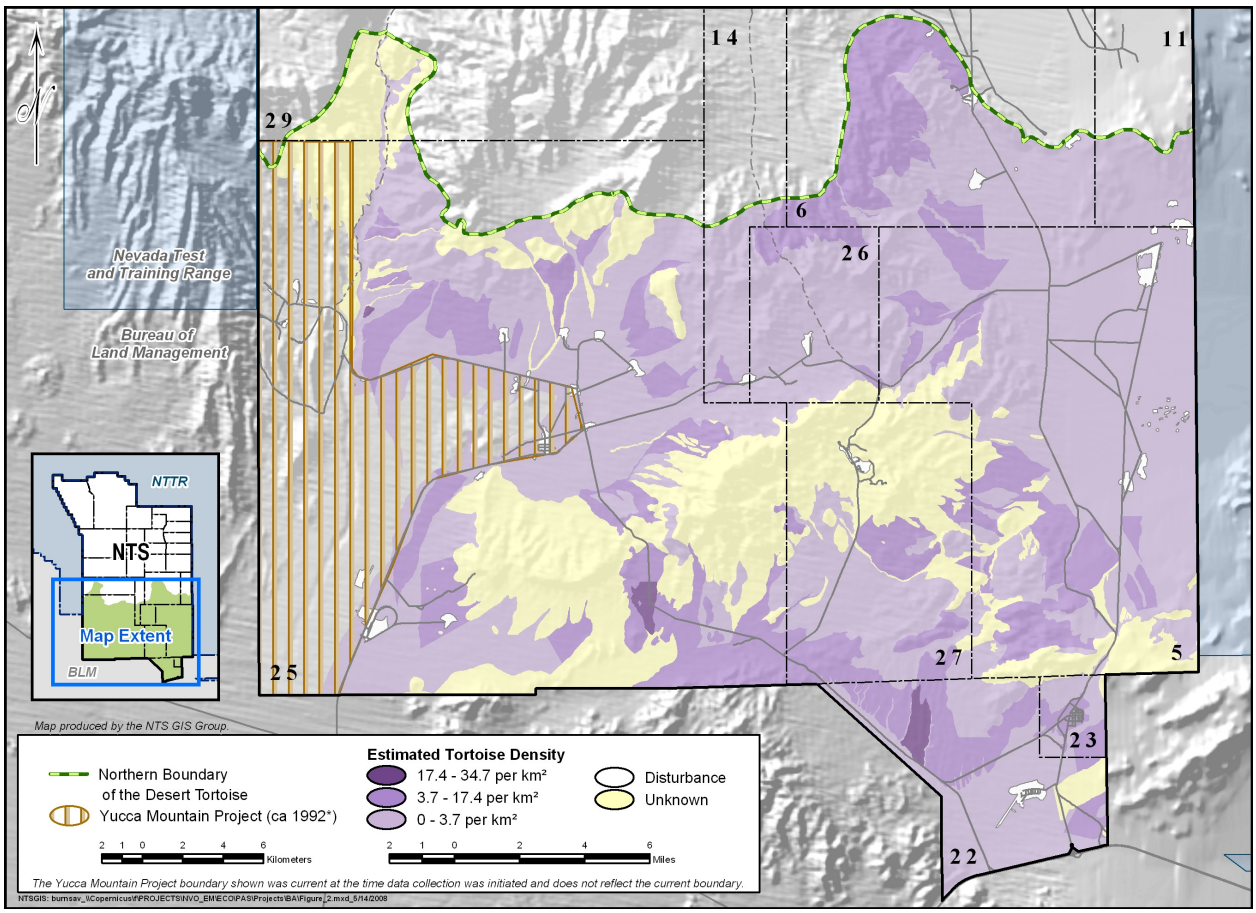

Figure 2. Desert tortoise relative abundance on the NTS.

3.2 DISTRIBUTION

Desert tortoises generally occur throughout the southern one-third of the NTS (Figure 1) (Rautenstrauch et al., 1994). They are found more commonly in bajadas and lower slopes of southern mountains and are rare or absent from the lower basins particularly in Frenchman flats. The northern boundary on the NTS is shown in Figure 1. This northern boundary for the desert tortoise occurs between elevations of approximately 1,220 m (3,900 ft) and 1,525 m (4,880 ft). The vegetation in the boundary region is dominated by blackbrush (*Coleogyne ramosissima*), spiny hopsage *(Grayia spinosa),* and Anderson wolfberry *(Lycium andersonii).*

3.3 CRITICAL HABITAT

The NTS contains less than 1 percent of the total habitat of the desert tortoise population that is listed as threatened. Critical habitat for the desert tortoise has not been designated on the NTS nor is the NTS within any Desert Wildlife Management Area delineated in the Recovery Plan for the Desert Tortoise (Mojave Population) (FWS, 1994).

4.0 DESCRIPTION OF PROGRAMS

4.1 PROGRAMS

The NTS EIS evaluated projects and activities categorized into five program areas (missions). These programs and their purposes are described as follows:

Defense Programs - The primary mission of the NNSA Defense Programs at the NTS is to ensure the safety and reliability of the nation's nuclear weapons stockpile. The NTS has a long history of participating in the Stockpile Stewardship Program, including maintaining the readiness and capability to conduct underground nuclear weapons tests and conducting such tests if so directed by the President (DOE 1996). Other aspects of stockpile stewardship include conventional high-explosives tests, dynamic experiments (including subcritical experiments [formerly called dynamic plutonium experiments]), and hydrodynamic testing. The NTS has been a key site for past efforts in the areas of nuclear nonproliferation and verification of international treaties.

Waste Management Program - The primary mission of the Waste Management Program is to serve as a low-level and mixed low-level radioactive waste disposal facility in support of DOE. The NTS provides disposal capability for NTS-generated waste and other DOE-approved waste generators. The NTS continues to store existing transuranic and mixed transuranic waste pending transportation for disposal at the Waste Isolation Pilot Plant. Hazardous waste is accumulated and stored at the Resource Conservation and Recovery Act (RCRA) Part B-permitted storage facility, and the majority is sent offsite for treatment or disposal. Waste explosives are treated in the RCRA Part B-permitted Explosive Ordnance Disposal Unit.

Environmental Restoration Program - The Environmental Restoration Program is committed to assessing and remediating contaminated sites, complying with all applicable environmental regulations and statutes, and protecting the health and safety of workers and the public.

Nondefense Research and Development - Consistent with past practices, NNSA supports a variety of research and development activities in cooperation with universities, industry, and other federal agencies. Examples include safety aspects of handling and responding to incidents involving hazardous materials and evaluation of solar energy technologies and options.

Work-for-Others Program - The Work-for-Others Program involves the shared use of certain NTS and Tonopah Test Range facilities and resources with other Federal agencies, such as the U.S. Department of Defense. Activities may require large, remote, and secure areas, and include various military training exercises and research and development projects.

4.2 PROGRAM UPDATES

This section provides an update of the NTS program areas since the NTS EIS was issued and projected activities through 2012. The five NTS program areas are Defense Programs, the Waste

Management Program, the Environmental Restoration Program, the Nondefense Research and Development Program, and the Work-for-Others Program.

For each program area, the status of program activities as described in the NTS EIS is presented, followed by a description of new projects, activities, and facilities that have been initiated since the issuance of the NTS EIS. These new projects, activities, and facilities are within the range of activities evaluated in the NTS EIS as determined through an NNSA/NSO NEPA review, inclusion in the *2002 NTS SA* (DOE 2002a), or through preparation of separate NEPA documentation (an EA or EIS). Where a separate NEPA document was prepared, it is identified in the description.

4.2.1 Defense Programs Facilities and Activities Since the NTS EIS

Table 3–1 in the attached draft Supplement Analysis lists each of the defense programs activities evaluated in the NTS EIS (derived from Table S–1 of the NTS EIS) and provides the current status of each activity. As noted in Table 3–1, the ongoing key NTS defense programs-related activities include maintaining readiness to conduct full-scale nuclear testing, conducting underground nuclear weapons testing, handling damaged and foreign nuclear weapons, and conducting dynamic experiments (including subcritical experiments). Section 3.1.1.2 describes the NTS Defense Programs activities and facilities initiated since the NTS EIS was prepared, including stockpile stewardship activities and experiments. Only three of these facilities occur in the range of desert tortoises on the NTS: Joint Actinide Shock Physics Experiment Facility (Jasper), Baker Facility, and the Device Assembly Facility (DAF).

The JASPER Facility (construction completed in September 1999) conducts shock physics experiments on special nuclear material and other actinide materials. JASPER uses a two-stage, light-gas gun to shoot projectiles at actinide target materials located in a primary target chamber within a secondary confinement chamber. As many as 24 special nuclear material shots per year could be conducted (NTS, 2007). More than two dozen plutonium experiments have been conducted to date. JASPER generates small quantities of transuranic waste.

The Baker Site Facility is a staging, assembly, and storage facility for explosives used at BEEF, the JASPER Facility, and other approved NTS locations. The facility is located at the Baker Site in NTS Area 27, described in Appendix A of the NTS EIS. The Baker Site Facility was included in the *2002 NTS SA* as the Nevada Energetic Materials Operations Facility (DOE 2002a).

The DAF is a multi-structure facility where nuclear devices and high explosives can be assembled, disassembled or modified, staged, and component-tested. Since the NTS EIS, NNSA has constructed a glovebox system and a downdraft table capable of handling plutonium and other special nuclear material at the DAF (NTS, 2007). NNSA relocated the principal Los Alamos National Laboratory Technical Area 18 operational activities involved in the research, design, development, construction, and application of experiments on nuclear criticality to the DAF. The NNSA ROD for the *Final Environmental Impact Statement for the Proposed Relocation of Technical Area 18 Capabilities and Materials at the Los Alamos National Laboratory* (DOE 2002b) selected the DAF at the NTS for the Criticality Experiments Facility (CEF). Most of the special nuclear material formerly at Technical Area 18 has been transferred to the DAF. Operations in support of NNSA and other national missions have begun. Modification

of some of the DAF buildings to allow operation of the CEF criticality machines commenced in May 2007 (NTS, 2007).

NNSA is currently developing plans for the use of DAF for limited nuclear weapons dismantlement activities. Currently, dismantlement of nuclear weapons occurs at the Pantex Plant in Texas. DAF would be used for dismantlement of certain weapons or weapon systems that have unique requirements for dismantling, which would allow the Pantex Plant to conduct higher volume work. Using DAF for limited dismantlement would aid in meeting the United States' obligation to reduce its nuclear stockpile. The use of the DAF for the weapons assembly/disassembly activities currently conducted at the Pantex Plant was addressed in the *Stockpile Stewardship and Management PEIS*; the NTS EIS addressed conducting these activities and reserving land and infrastructure for accepting the full mission at the NTS. The number of weapons shipments to the NTS under this activity would be no more than the number of shipments analyzed in the NTS EIS. Waste would consist of high explosives that may be sent to the Explosive Ordnance Disposal Unit in Area 11 for treatment and low-level radioactive waste (rags, etc.) that would be disposed at the Area 5 Radioactive Waste Management Site (RWMS). Treatment of high explosives at the Area 11 Explosive Ordnance Disposal Unit would be in accordance with the NTS RCRA and Air Quality Operating permits. Plutonium pits and highly enriched uranium would be stored for a short time until they could be transferred to the Pantex Plant, the Y-12 National Security Complex, or another NNSA facility. Some non-nuclear components may be cleaned and recycled, if appropriate.

Proposed Future Projects

On January 11, 2008, NNSA issued a Notice of Availability (73 FR 2023) of a Draft *Complex Transformation Supplemental Programmatic EIS*. As part of the *Complex Transformation SPEIS*, the NTS is identified as an alternative site for the following facilities and activities (DOE, 2007; NTS, 2007):

- Consolidated Plutonium Center
- Consolidated Weapons Program special nuclear material storage
- Consolidated hydrotesting – this was originally proposed in the *2002 NTS SA* as the Advanced Hydrotest Facility
- Consolidated major environmental testing (facilities for putting environmental stresses [heat, cold, vibration, etc.]) on nuclear weapons components
- NNSA flight test operations currently performed at the Tonopah Test Range
- Consolidated Nuclear Production Center

Proposed Complex Transformation missions and facilities are addressed in the cumulative impacts portion of this SA. The Notice of Intent regarding the *Complex Transformation SPEIS* (71 FR 61731) announced the cancellation of NNSA's previous proposal to build a modern pit

facility for which a draft Supplemental EIS was issued in June 2003 (68 FR 33487). (The modern pit facility was included in the *2002 NTS SA* as a possibility for the NTS.)

4.2.2 Waste Management Facilities and Activities Since the *NTS EIS*

Table 3–2 of the Draft Supplement Analysis lists each of the waste management activities evaluated in the NTS EIS and the current status. Existing waste management facilities and activities are expected to largely continue over the next five years. The NTS will continue to be a regional disposal center for low-level and mixed low-level radioactive waste generated throughout the DOE Complex. Current disposal operations will continue, as will other management operations such as temporary waste storage and confirmatory waste examination. Only two of the existing waste management facilities, Area 5 Radioactive Waste Management Site (RWMS) and Area 23 Solid Waste disposal site, occur in the range of desert tortoises on the NTS. The Area 5 RWMS site is within an exclusion area identified in the 1996 Biological Opinion since no desert tortoises have been recorded in that area of Frenchman Flats.

Proposed Future Activities.

Possible new waste management activities are:

- *Treatment of RCRA or Toxic Substances Control Act wastes.* With the exception of wastes treated at the Area 11 Explosive Ordnance Disposal Unit, DOE is not permitted to treat hazardous (RCRA) waste, the hazardous (RCRA) portion of mixed low-level radioactive waste, or Toxic Substances Control Act waste at the NTS. Several offsite generators have requested that the NTS provide in-cell macro-encapsulation for debris waste streams containing hazardous or toxic constituents. This activity would require a permit from the Nevada Division of Environmental Protection.

- *Disposal of GTCC low-level radioactive waste.* As addressed in Chapter 1, DOE is preparing a *GTCC EIS* to address disposal of GTCC low-level radioactive waste and GTCC-like DOE waste. The NTS is being considered as one of eight candidate DOE sites for disposal of such waste, along with generic commercial disposal facility options in arid and humid environments. The alternatives in the *GTCC EIS* could result in changes to facilities and operations at the NTS, but because the alternatives are still being developed and disposal facility operation would not occur before 2012, they are not able to be addressed in detail in this SA.

- *Transloading of waste shipments to the NTS.* To provide NTS-approved generators with additional cost-effective waste transportation options, the NTS staff has encouraged the establishment of transloading alternatives. There are no transloading facilities for low-level or mixed low-level radioactive waste operating in the state of Nevada. In addition, NSO encourages generators and their transporters to review route selections and requires that shipments avoid Hoover Dam and the Las Vegas metropolitan area. To date, six commercial vendors have expressed interest in offering transloading services.

Since the NTS EIS, NTS has significantly reduced the volume of legacy transuranic and mixed transuranic waste at the NTS, by repackaging, characterizing, and shipping the stored waste to the WIPP. The NTS intends to ship nearly all the remaining legacy waste for offsite disposition in 2008. Operations at JASPER annually result in about 23 cubic meters (810 cubic feet) of newly generated transuranic waste that will also be sent for offsite disposition.

Five potential low-level radioactive waste streams were identified in the *2002 NTS SA* for management at the NTS (DOE 2002a). To date, only two of these waste streams have been disposed at the NTS:

- Low-level radioactive waste generated by Battelle Columbus
- Thorium nitrate waste from the U.S. Department of Defense

NTS-approved generators have provided forecasts of low-level and mixed low-level radioactive wastes that are planned for NTS disposal (see Section 5.2 of the attached draft SA; DOE, 2008). Other potential low-level and mixed low-level radioactive waste streams, however, have been identified that are not at this time planned for NTS disposal but may be considered for NTS disposal. The actual generation of these waste streams is uncertain or there are options for their disposition other than disposal at the NTS. These waste streams are listed below:

- U.S. Department of Defense waste from accidents involving nuclear weapons
- U.S. Department of Defense and DOE strontium-90 radioisotope thermoelectric generators other than those in current forecasts
- Depleted uranium hexafluoride conversion waste
- U.S. Department of Defense cleanup of facilities or sites containing depleted uranium
- Site cleanups at former Manhattan Project and supporting facilities
- Former research reactor site cleanups
- Disposition of uranium-233 waste from Oak Ridge National Laboratory
- DOE Naval Reactors Program waste
- Waste from environmental restoration at Los Alamos National Laboratory

4.2.3 Environmental Restoration Program Since the *NTS EIS*

The Environmental Restoration Program addresses three sub-project areas and four other related activity projects. Since the *NTS EIS*, the Underground Test Area, Soils Media, and Industrial Sites titles have changed from Corrective Action Units to Sub-Projects (NTS, 2007). Table 3–3 of the draft Supplement Analysis (DOE, 2008) lists each of the environmental restoration program activities evaluated in the *NTS EIS* and the *2002 NTS SA*. The table was derived from Table S–3 of the *NTS EIS* and reflects the updated titles and the current status of each activity. The first column under each project is updated to reflect activities expected to continue or reach

completion in the next five years (2008 to 2012) under the SA (NTS, 2007). Some of the sites do occur in desert tortoise habitat but most occur north of the desert tortoise range distribution on the NTS.

4.2.4 Nondefense Research and Development Program Activities Since the *NTS EIS*

Table 3–4 of the draft SA lists each of the Nondefense Research and Development Program activities evaluated in the NTS EIS (derived from Table S–4 of the *NTS EIS*) and provides the current status of each activity. Two of these activities, Nevada Environmental Research Center and Solar Power Plant, occur within the range of the desert tortoise.

As part of the Nevada Environmental Research Park, there are two facilities operated by the Desert Research Institute; the University of Nevada, Las Vegas; and the University of Nevada, Reno (NDRC 2007). These are the Nevada Desert Free Air Carbon Dioxide Enrichment Facility and the Mojave Desert Global Change Facility. Since operations began in 1997, the Nevada Desert Free Air Carbon Dioxide Enrichment Facility has been conducting a 20-year study on the impact of elevated carbon dioxide on the Mojave Desert ecosystem. At the Mojave Global Change Facility, research on effects of other predicted climate changes are underway, specifically nitrogen deposition, crust disturbance, and increased precipitation.

A solar power plant has been proposed for the Solar Enterprise Zone at the NTS in Area 22 that would be a commercial, utility-scale solar power plant (NTS 2007). The power plant could produce up to 200 megawatts of electricity. The proposed technology would concentrate solar power (Fresnel lens/trough type) using tracking/positioning arrays. The power generated would supply the NTS with the majority of its required power and excess power would be distributed to Nevada utilities. Power transmission would be via the Mercury sub-station and existing connected transmission lines, although transmission line upgrades may be required. Additional 200-megawatt power plants may be added in modular form (for future development). Planning, development, and construction prior to operation are expected to take three to five years.

4.2.5 Work-for-Others Activities and Facilities Identified Since the *NTS EIS*

Table 3–5 lists each of the Work-for-Others activities evaluated in the NTS EIS and provides the current status of each activity. More detailed descriptions of the activities are included in the NTS EIS. Four of these activities, National Center for Combating Terrorism, Nonproliferation Test and Evaluation Complex, Activities Using Biological Simulants and Releases of Chemicals at the Nevada Test Site, and Radiological/Nuclear Countermeasures Test and Evaluation Complex, may occur within the range of desert tortoises. These activities are discussed below.

The National Center for Combating Terrorism provided a comprehensive, fully integrated system of facilities and capabilities to meet a wide range of combating terrorism requirements, including research, development, testing and evaluation; exercises; training; and intelligence support. The program was analyzed in a Supplement Analysis to the NTS EIS in 2003 (DOE, 2003). Construction of the National Center for Combating Terrorism was completed in 2006. Training is ongoing through the Counterterrorism Support Program.

The Nonproliferation Test and Evaluation Complex (originally called the Liquified Gaseous Fuels Spill Test Facility and then the HazMat Spill Center) conducts research on the behavior and safety aspects of chemical handling and releases including releases due to explosive detonations. An EA prepared and a FONSI signed in September 2002 for the HazMat Spill Center further expanded the capabilities to address national needs for emergency response and counterterrorism training (DOE, 2002c). The Nonproliferation Test and Evaluation Complex serves as a chemical and biological test center. Such work includes research, development, testing, and evaluation of applied technologies; training and exercises; and/or integration of these activities. In 2004 the NTS expanded its capabilities to conduct tests and experiments involving the release of biological simulants and low concentrations of chemicals at various NTS locations (DOE, 2004a) under the Work-for-Others Program.

Activities Using Biological Simulants and Releases of Chemicals at the Nevada Test Site. One of the NTS roles is to provide the capability to conduct chemical release tests to assess risks from accidental releases of hazardous materials, to provide data on sensor development, and to provide first responder training (DOE 2002c). In a 2004 EA, NNSA/NSO evaluated impacts associated with tests and experiments involving the release of biological simulants and low concentrations of chemicals at various locations within the NTS (DOE, 2004a). Additionally, the EA evaluated a modification to the release parameters under which the Nonproliferation Test and Evaluation Complex (then called the HAZMAT Spill Center) operated at the time. A FONSI was issued on June 30, 2004. The activities involve no construction, permanent land disturbance, or land use changes (DOE, 2004a). There has been an average of approximately eight to 16 campaigns per year with approximately ten testing days per campaign (NTS, 2007).

Radiological/Nuclear Countermeasures Test and Evaluation Complex. The DHS requested that NNSA/NSO construct, operate, and maintain the Radiological/Nuclear Countermeasures Test and Evaluation Complex for use by DHS. An EA was finalized in August 2004 (DOE, 2004b) and a FONSI issued. The Radiological/Nuclear Countermeasures Test and Evaluation Complex, currently under construction, is an isolated complex located in Area 6 south of the DAF that supports capabilities for post bench-scale testing of radiological and nuclear detection devices that may be used in transportation-related facilities. Testing and evaluation activities include prototype detector testing and evaluation; systems testing and evaluation; performance standards validation; demonstration of prototype detectors, systems, and performance standards; verified threat demonstration; concept of operations evaluation and verification; and training.

5.0 POSSIBLE EFFECTS ON THE DESERT TORTOISE

This chapter summarizes the potential direct and indirect negative, beneficial, and cumulative effects on desert tortoises of activities on the NTS. The significance of these impacts on the desert tortoise is also summarized. The significance of effects was determined under the assumption that measures to minimize and mitigate impacts are implemented. The methods for minimizing and mitigating impacts are summarized in Section 6.0.

5.1 POTENTIAL DIRECT NEGATIVE EFFECTS

5.1.1 Mortality by Vehicles

Desert tortoises may be killed or injured on roads by vehicles traveling to and from activities on the NTS. There are about 220 km (137 mi) of paved roads, 170 km (106 mi) of maintained unpaved roads, and 240 km (149 mi) of unimproved roads along power lines on the NTS within the range of the desert tortoise. Prior to 1992, only four tortoises were reported to have been killed on NTS roads, although no system existed then to record such events. Since May 1992, all sightings of dead and live tortoises on roads have been recorded to comply with the reporting requirements of both the Biological Opinion for the Yucca Mountain Site Characterization Project and the Biological Opinion for NNSA/NSO Activities. A total of five tortoises have been reported killed on roads between May 1992 and September 1995. From 1996 to present a total of six desert tortoises have been killed along highways while 63 have been moved from roads to prevent injury or death. This low number of deaths on roads can be attributed to the ongoing Desert Tortoise Worker Education Program and NTS employee awareness and concern for the environment.

5.1.2 Mortality from Construction Activities

Desert tortoises may be killed during ground disturbing or construction activities. To date no desert tortoises have been killed during construction activities on the NTS. This can be attributed to 1) the very low abundance of desert tortoises on the NTS, 2) surveys of proposed construction areas in desert tortoise habitat prior to any ground disturbance, and 3) the onsite presence of an environmental monitor during construction activities.

5.2 POTENTIAL INDIRECT NEGATIVE EFFECTS

5.2.1 Habitat Loss

Loss of tortoise habitat will occur when burrows, foraging areas, water sources, or other areas used by tortoises are disturbed or destroyed. The various ongoing and proposed activities on the NTS will have some impacts on habitat loss since many of the activities will take place on previously undisturbed areas. Individual and one time off-road events may not impact habitat much but multiple passes will damage plants and make resprouting and recovery of shrubs more difficult. Large scale clearing of habitat during construction will result in tortoise habitat loss.

5.2.2 Human Disturbances

It is unknown whether disturbances such as human presence, noise, ground vibration, and other subtle disturbances have a negative effect on tortoises. The secure nature of the NTS restricts recreational or off-road driving activities and the education of employees helps minimize impacts of human disturbance.

5.3 POTENTIAL BENEFICIAL EFFECTS

Access to the NTS is restricted. This prevents tortoises on the NTS from being collected or harassed by the public. All employees are made aware of the status of desert tortoises and have received training on what to do when a desert tortoise is seen or in danger. NNSA/NSO security and management guidelines prohibit grazing, hunting, trapping, carrying firearms, off-road driving, and harassing wildlife.

5.4 CUMULATIVE EFFECTS

Title 50 CFR 402.14 (c) (4) requires NNSA/NSO to analyze any cumulative effects of proposed actions. Cumulative effects are defined in 50 CFR 402.02 as "...those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." Any future actions that at some point will be subjected to either the Section 7 consultation process or Section 10 permitting procedures, and could not occur unless they were able, in their own right, to avoid jeopardizing the continued existence of the affected species, are excluded from this cumulative effects analysis. NNSA/NSO is unaware of any State or private activities within the proposed action area that will affect desert tortoises or their habitat, or might result in incidental take, that will not be subject to either the Section 7 or Section 10 regulations.

6.0 MITIGATION ACTIONS

The following proposed mitigation actions will be implemented to help minimize impacts to desert tortoises.

6.1 GENERAL DESERT TORTOISE MITIGATION ACTIONS

The following mitigation actions are currently in place for the NTS and will be followed to mitigate impacts to the desert tortoise during proposed program activities.

6.1.1 Project Review and Preactivity Surveys

All proposed land-disturbing activities on the NTS will be reviewed to ensure compliance with the ESA and NNSA environmental policies. As part of this review, preactivity surveys will be conducted at proposed project sites to determine the presence of the desert tortoise. Whenever possible, NNSA/NSO will modify the design or location of a project when it will impact the survival of the desert tortoise or may result in the incidental take of a desert tortoise.

6.1.2 Environmental Monitor Present During Project Construction

A tortoise biologist or environmental monitor will be onsite during all phases of project construction when the project is located within desert tortoise habitat classes low or moderate (Table 1) as displayed in Figure 2. This will ensure that construction activities will not inadvertently harm desert tortoises.

6.1.3 Employee Education

All NNSA/NSO and contractor personnel working on the NTS in tortoise habitat will complete the Desert Tortoise Conservation Education Program, which was reviewed by FWS in 1991 (FWS correspondence to Robert Friedrichs, July 12, 1991). The program provides information relative to the occurrence of the desert tortoise on the NTS, the threatened status of the species, the definition of "take," the potential for impacts to the tortoise, the potential penalties for taking a threatened species, and the procedures for protecting tortoises.

6.1.4 On-call Biologist

Project personnel will halt activities, if possible, when the continuation of such activities may endanger a desert tortoise or if a tortoise is found on a project site. An on-call biologist will be contacted and will respond to the sighting within one hour of notification during normal operating hours. Project activities will resume after the on-call biologist assesses the situation and takes appropriate action to avoid, minimize, or mitigate the direct impact to the animal.

6.1.5 Prohibition of Off-Road Vehicle Travel

Vehicle traffic is restricted to existing paved, graded, or utility access roads by NNSA/NSO administrative policy (DOE/NV, 1991). Under this policy vehicles will not be driven off existing roads in non-emergency situations unless authorized by NNSA/NSO. For security exercises and other approved non-routine events, off-road travel may be required.

6.1.6 Establishment of Speed Limits

All vehicles will be driven at speeds within posted speed limits on existing roads and will not exceed 15 mph within project boundaries. Any tortoise observed in harm's way on a paved road will be moved off the road in the direction it was going in accordance with FWS tortoise handling procedures (Desert Tortoise Council, 1994).

6.1.7 Litter Control Program

NNSA/NSO will implement a litter control program during outdoor program activities that will include the use of covered, raven-proof trash receptacles; disposal of edible trash in trash receptacles following the end of each work day, and disposal of trash in a designated sanitary landfill at the end of each work week. Material placed in a sanitary landfill will be covered daily when the landfill is open, as per NNSA/NSO standard operating procedures.

6.2 SITE-SPECIFIC DESERT TORTOISE MITIGATION ACTIONS

6.2.1 Habitat Reclamation

NNSA/NSO submitted a habitat reclamation plan to FWS that describes the methods of stabilizing and revegetating sites. The goal of habitat reclamation is to establish a stable, non-eroding soil surface. A habitat reclamation plan for the NTS was approved by FWS and may serve as an alternative to payment into the Clark County Habitat Conservation Fund. When a disturbance occurs in desert tortoise habitat the disturbance may be reclaimed following the completion of the activities. Native perennial and annual plants, including forage species of desert tortoises on the NTS (Rakestraw et al, 1995), will be used in the reclamation process as much as possible. The goals of revegetation will be to minimize soil loss and to restore native vegetative cover so it is similar to surrounding native land. The revegetation of sites will hasten plant succession. Successful reclamation within tortoise habitat will restore disturbed habitat to suitable tortoise habitat.

7.0 SIGNIFICANCE

NNSA/NSO has determined during this Biological Assessment that the activities it will conduct during the next five years on the NTS may adversely affect individual desert tortoises and their habitat. In spite of proposed mitigation procedures, some tortoises may be accidentally killed or injured, tortoise habitat may be disturbed, and some tortoise burrows may be destroyed. However, NNSA/NSO has concluded that the potential negative effects will be limited in scope and will not threaten the continued existence of the species on the NTS and nearby areas or throughout its range for the following reasons.

1. Less than 1% of the total habitat for the desert tortoise population that is listed occurs on the NTS. A small fraction of the habitat will be disturbed by proposed program activities. The abundance of desert tortoises on the NTS is classified as very low or none.

2. All personnel who work on the NTS will complete the Desert Tortoise Conservation Education Program and be educated as to desert tortoise protection, importance, conservation, as well as penalties associated with collecting, harassing, killing, or injuring tortoises.

3. During normal operations, if a tortoise is found, a tortoise biologist will be contacted and will assess the situation and take the appropriate action to ensure that the desert tortoise is not injured or otherwise negatively impacted.

4. NNSA/NSO recognizes that the NTS contains habitat for the desert tortoise. Attempts will be made to reclaim any newly disturbed areas. This will offset the losses of desert tortoise habitat that may be disturbed by NTS program activities.

5. The Secretary of the Interior did not designate critical habitat for the desert tortoise on the NTS, therefore, no critical habitat will be disturbed as a result of proposed NTS program activities.

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Appendix 1. List of sensitive and protected/regulated species known to occur on or adjacent to the NTS.

Plant Species	Common Names	Status[a]
Moss Species		
Entosthodon planoconvexus	Convex entosthodon moss	W, 5 years
Flowering Plant Species		
Arctomecon merriamii	White bearpoppy	S, 10 years
Astragalus beatleyae	Beatley milkvetch	S, 5 years
Astragalus funereus	Black woollypod	S, 5 years
Astragalus oophorus var. *clokeyanus*	Clokey eggvetch	S, 5 years
Camissonia megalantha	Cane Spring suncup	S, 10 years
Cymopterus ripleyi var. *saniculoides*	Sanicle biscuitroot	S, 10 years
Eriogonum concinnum	Darin buckwheat	S, 5 years
Eriogonum heermannii var. *clokeyi*	Clokey buckwheat	S, 5 years
Frasera pahutensis	Pahute green gentian	S, 10 years
Galium hilendiae ssp. *kingstonense*	Kingston Mountains bedstraw	S, 10 years
Hulsea vestita ssp. *inyoensis*	Inyo Hulsea	S, 10 years
Ivesia arizonica var. *saxosa*	Rock purpusia	S, 5 years
Lathyrus hitchcockianus	Bullfrog Mountain pea	S, 5 years
Phacelia beatleyae	Beatley scorpionflower	S, 10 years
Penstemon fruticiformis spp. *amargosae*	Death Valley beardtongue	S, 5 years
Penstemon pahutensis	Pahute Mesa beardtongue	S, 10 years
Phacelia filiae	Clarke phacelia	S, 10 years
Phacelia mustelina	Weasel phacelia	S, 10 years
Phacelia parishii	Parish phacelia	S, 10 years
Agavaceae	Yucca (3 species), Agave (1 species)	CY
Cactaceae	Cacti (18 species)	CY
Juniperus osteosperma	Juniper	CY
Pinus monophylla	Pinyon	CY

Appendix 1. List of sensitive and protected/regulated species known to occur on or adjacent to the NTS. (Cont'd)

Animal Species	Common Name	Status[a]
Mollusk Species		
Pyrgulopsis turbatrix	Southeast Nevada pyrg	S, A
Reptile Species		
Eumeces gilberti rubricaudatus	Western red-tailed skink	S, E
Gopherus agassizii	Desert tortoise	LT, S, NPT, IA
Bird Species		
Accipiter gentilis	Northern goshawk	S, NPS, IA
Alectoris chukar	Chukar	G
Aquila chrysaetos	Golden eagle	EA, NP
Buteo regalis	Ferruginous hawk	S, NP, IA
Callipepla gambelii	Gambel's quail	G
Charadrius montanus	Mountain plover	PT, NP
Coccyzus americanus	Western yellow-billed cuckoo	C, S, NPS, IA
Falco peregrinus	Peregrine falcon	<LE, S, NPE, IA
Haliaeetus leucocephalus	Bald eagle	<LT, EA, S, NPE, IA
Ixobrychus exillis hesperis	Western least bittern	S, NP, IA
Lanius ludovicianus	Loggerhead shrike	NPS
Oreoscoptes montanus	Sage thrasher	NPS
Phainopepla nitens	Phainopepla	S, NP, IA
Spizella breweri	Brewer's sparrow	NPS
Toxostoma bendirei	Bendire's thrasher	S, NP, IA
Toxostoma lecontei	LeConte's thrasher	S, NP, IA
Mammal Species		
Antilocapra americana	Pronghorn antelope	G
Antrozous pallidus	Pallid bat	M, NP, A
Corynorhinus townsendii	Townsend's big-eared bat	H, NPS, A
Equus asinus	Burro	H&B
Equus caballus	Horse	H&B
Euderma maculatum	Spotted bat	M, NPT, A
Lasionycteris noctivagans	Silver-haired bat	M, A
Lasiurus blossevillii	Western red bat	H, NPS, A

Appendix 1. List of sensitive and protected/regulated species known to occur on or adjacent to the NTS. (Cont'd)

Animal Species	Common Name	Status[a]
Lasiurus cinereus	Hoary bat	M, A
Lynx rufus	Bobcat	F
Microdipodops megacephalus	Dark kangaroo mouse	NP
Microdipodops pallidus	Pale kangaroo mouse	S, NP, A
Myotis californicus	California myotis	M, A
Myotis ciliolabrum	Small-footed myotis	M, A
Myotis evotis	Long-eared myotis	M, A
Myotis thysanodes	Fringed myotis	H, NP, A
Myotis yumanensis	Yuma myotis	M, A
Ovis canadensis nelsoni	Desert bighorn sheep	G
Odocoileus hemionus	Mule deer	G
Pipistrellus hesperus	Western pipistrelle	M, A
Puma concolor	Mountain lion	G
Sylvilagus audubonii	Audubon's cottontail	G
Sylvilagus nuttallii	Nuttall's cottontail	G
Tadarida brasiliensis	Brazilian free-tailed bat	NP
Urocyon cinereoargenteus	Gray fox	F
Vulpes velox macrotis	Kit fox	F

[a]Status Codes:

Endangered Species Act, U.S. Fish and Wildlife Service

- LT - Listed Threatened
- C - Candidate for listing
- <LE - Former listed endangered species
- <LT - Former listed threatened species

U.S. Department of Interior

- H&B - Protected under *Wild Free Roaming Horses and Burros Act*
- EA - Protected under *Bald and Golden Eagle Act*

State of Nevada-Animals

- S - Nevada Natural Heritage Program—Animal and Plant At Risk Tracking List
- NPE - Nevada Protected-Endangered, species protected under Nevada Administrative Code (NAC) 503
- NPT - Nevada Protected-Threatened, species protected under NAC 503
- NPS - Nevada Protected-Sensitive, species protected under NAC 503
- NP - Nevada Protected, species protected under NAC 503
- G - Regulated as game species
- F - Regulated as fur-bearer species

State of Nevada-Plants

S - Nevada Natural Heritage Program –Animal and Plant At Risk Tracking List
CY - Protected as a cactus, yucca, or Christmas tree

Long-term Animal Monitoring Status for the Nevada Test Site (NTS)
A - Active
IA - Inactive
E - Evaluate

Long-term Plant Monitoring Status for the NTS)
5 years - Monitor a minimum of once every 5 years
10 years - Monitor a minimum of once every 10 years

Nevada Bat Conservation Plan – Bat Species Risk Assessment
H - High
M - Moderate

b All bird species on the NTS are protected by the *Migratory Bird Treaty Act* except for Chukar, Gambel's quail, English house sparrow, Rock dove, and European starling.