
National Park Service
U.S. Department of the Interior



Rural Utilities Service
U.S. Department of Agriculture



DRAFT ENVIRONMENTAL ASSESSMENT

Fiber Optic Line SR85 - Why to Organ Pipe Cactus National Monument Headquarters



AUGUST 2007

Proposed Fiber Optic Line

Environmental Assessment

Organ Pipe Cactus National Monument • Arizona

The National Park Service (NPS) and the Rural Utilities Service (RUS) are proposing to construct a fiber optic line between Why, Arizona and Organ Pipe Cactus National Monument's (OPCNM) headquarters. The purpose of the proposed project is to replace and upgrade the telecommunications system between Why and OPCNM's headquarters in order to provide improved safety for residents and visitors in the region and additional, more reliable, and faster telecommunications networking services in the area. The proposed project is needed because the current telecommunications system serving the region is outdated because it utilizes an antenna, and replacement parts for this system are not available.

The Proposed Alternative would install 22 miles of buried fiber optics line on the west side of State Route (SR) 85 between Why and OPCNM headquarters, within unincorporated Pima County, Arizona. The project limits lie mostly within OPCNM, but also cross portions of Arizona State Trust lands, Bureau of Land Management lands, and private lands. The project includes construction, operation, and maintenance of a telecommunications cable and ancillary facilities. The fiber optics would be placed at least 12 feet from the edge of SR85 asphalt, with a maximum distance of disturbance at 30 feet from the edge of asphalt. Trenches would be dug using a vibratory plow and is estimated to be 36 inches deep by one foot wide. Trenches would not be dug through washes and areas with rocky substrates; rather the fiber optics line would be bored under washes and through rocky areas using a horizontal directional drilling rig. Further, ingress and egress routes to and from the construction sites will be required approximately every ½ mile. To minimize disturbance, all construction equipment will be rubber-tracked. The impacted area to accommodate equipment would be no more than 10 feet wide, and the total project disturbance would be less than 27 acres.

Adverse, localized to regional, short- and long-term, negligible to moderate impacts would occur to the environment due to construction activities under the proposed alternative; however, beneficial, localized to regional, short- and long-term, moderate impacts would occur due to additional, more reliable, and faster telecommunications networking services to the area. Impacts on visitor experiences, the health and safety of all people visiting or working in the parks, the socioeconomics of the region, and the future of communications on adjacent lands would be improved. No impairment of any park resources at OPCNM is expected.

Public Comment. This environmental assessment will be on public review for 30 days at <http://parkplanning.nps.gov/>. If you wish to comment on the environmental assessment, you may mail comments to the names and addresses below or electronic comments may be posted directly to the aforementioned website. Please note that names and addresses of people who comment become part of the public record. **If you wish us to withhold your name or address, you must state this prominently at the beginning of your comment.** We will make all submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

Lee Baiza, Superintendent
Organ Pipe Cactus National Monument
Ajo, AZ 85321

Mark Plank, Director
Engineering and Environmental Staff, RUS
1400 Independence Ave., SW
Washington, DC 20250-1571

TABLE OF CONTENTS

I. PURPOSE AND NEED	1
LEGISLATIVE MANDATES	4
Monument Mission and Goals	4
Federal Regulations and Guidance.....	4
OPCNM Land Designations.....	5
Bureau of Land Management Land Use Plans.....	5
State Trust Land Designations	5
County and Regional Planning Documents	5
ISSUES AND IMPACT TOPICS	5
Soils.....	6
Vegetation.....	6
Wildlife and Wildlife Habitat.....	6
Threatened, Endangered, and OPCNM Species of Concern	6
Visitor Use, Understanding, and Appreciation.....	6
Human Health and Safety	6
Park Management and Operations.....	7
Socioeconomics.....	7
Adjacent Lands.....	7
IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION	7
Floodplains.....	7
Air Quality	8
Soundscapes	9
Water Quality and Quantity	9
Wetlands.....	9
Wilderness, Wild and Scenic Rivers	9
Cultural Resources	10
Prime and Unique Farmlands	11
Indian Trust Resources.....	11
Environmental Justice.....	12
Geohazards	12
Streamflow Characteristics	12
Marine or Estuarine Resources	12
Unique, Essential or Important Fish or Fish Habitat	12
Sole Source Aquifers.....	12
Mineral Resources	12
Geothermal Resources	12
Paleontological Resources.....	13
Energy Resources.....	13
II. ALTERNATIVES CONSIDERED	14
NO-ACTION ALTERNATIVE	14
PROPOSED ALTERNATIVE	14
MITIGATING MEASURES	15
TTTC Design Responsibilities	15
Organ Pipe Cactus National Monument Responsibilities	16
Contractor Responsibilities.....	16
ENVIRONMENTALLY PREFERRED ALTERNATIVE	19
III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS	23
METHODOLOGY FOR ASSESSING IMPACTS	23
ENVIRONMENTAL COMPONENTS	23

General.....	23
Soils.....	24
Vegetation (including Riparian Areas).....	27
Wildlife	29
Threatened, Endangered, Candidate and OPCNM Species of Concern	32
Visitor Use, Understanding, and Appreciation.....	41
Human Health and Safety	44
Park Management and Operations.....	46
Socioeconomics.....	47
Adjacent Lands.....	49
IV. CONSULTATION AND COORDINATION.....	53
V. REFERENCES.....	56

Figures

Figure 1. State Map with Project Location.....	2
Figure 2. Vicinity Map with Project Location.....	3

Tables

Table 1. Comparison of Alternatives	21
Table 2. Comparison of Environmental Impacts	22
Table 3. Soil Characteristics.....	25
Table 4. Species listed by the USFWS (July 2007) for Pima County with the potential to occur in the project limits.	33

Appendices

Appendix A	U.S. Fish and Wildlife Service Technical Assistance and Informal Consultation Concurrence Letters
Appendix B	Construction Plan
Appendix C	Consultation Letter Sent to Arizona State Historic Preservation Office
Appendix D	Arizona Game and Fish Department Heritage Data Management System Special Status Species Information Letter
Appendix E	Development Actions Considered in Assessing Cumulative Impacts

I. PURPOSE AND NEED

Table Top Telephone Company, Inc. (TTTC), a Rural Utilities Service (RUS) company, is proposing to construct a fiber optic line between Why, Arizona and Organ Pipe Cactus National Monument's (OPCNM) headquarters within unincorporated Pima County, Arizona (Figure 1 - Project Location and Figure 2 - Project Vicinity), in fall 2007 to provide improved telecommunications to the region. The RUS would provide the funding for the project, and the majority of the proposed project would occur within OPCNM boundaries (but would also occur within Bureau of Land Management [BLM], Arizona State Trust Lands, and private lands); hence, OPCNM (under the administration of the National Park Service [NPS]), the BLM, and the Arizona State Land Department (ASLD) would issue right-of-way (ROW) permits. The NPS and RUS have agreed to be co-leads for the proposed action in preparing a Draft Environmental Assessment (DEA) (pursuant to the National Environmental Policy Act [NEPA] of 1969, the Council on Environmental Quality [CEQ] NEPA regulations [40 Code of Federal Regulations (CFR) 1500 to 1508], and the National Park Service [NPS] NEPA compliance guidelines [DO-12]).

The purpose of the proposed project is to replace and upgrade the telecommunications system between Why and OPCNM's headquarters in order to provide improved safety for residents and visitors in the region and additional, more reliable, and faster telecommunications networking services to the areas currently served by TTTC. TTTC provides telecommunication services to six rural communities in Arizona. The services include high-speed connections, which are required in today's environment for educational, medical, and business purposes.

The proposed project is needed because the current telecommunications system serving the region is outdated because it utilizes an antenna, and replacement parts for this system are not available. If this outdated system is not replaced, it will continue to limit:

- Reliability, speed and capacity
- OPCNM communications
- Law enforcement ability of the OPCNM Park Rangers, U.S. Border Patrol, U.S. Customs, the Sheriff Department, and the Department of Public Safety
- Service to other TTTC customers

The objectives of the proposed project are to:

- Provide additional, more reliable, and faster telecommunications networking services to the project area
- Improve communications for OPCNM and local law enforcement
- Improve safety for all residents, visitors and those traveling through the area through improved communications

This document was prepared in accordance with applicable NPS and RUS guidelines and policies for implementing NEPA on NPS lands. This document discusses potential environmental impacts associated with the proposed project. The purpose of this document is to guide decision makers in making informed decisions about the project. A Finding of No Significant Impact (FONSI) would be issued if NPS and RUS determine that the proposed project would not have a significant impact on the environment. Upon issuance of the FONSI, the RUS would provide funding for the project, and the NPS, the BLM, and the ASLD would issue ROW permits.

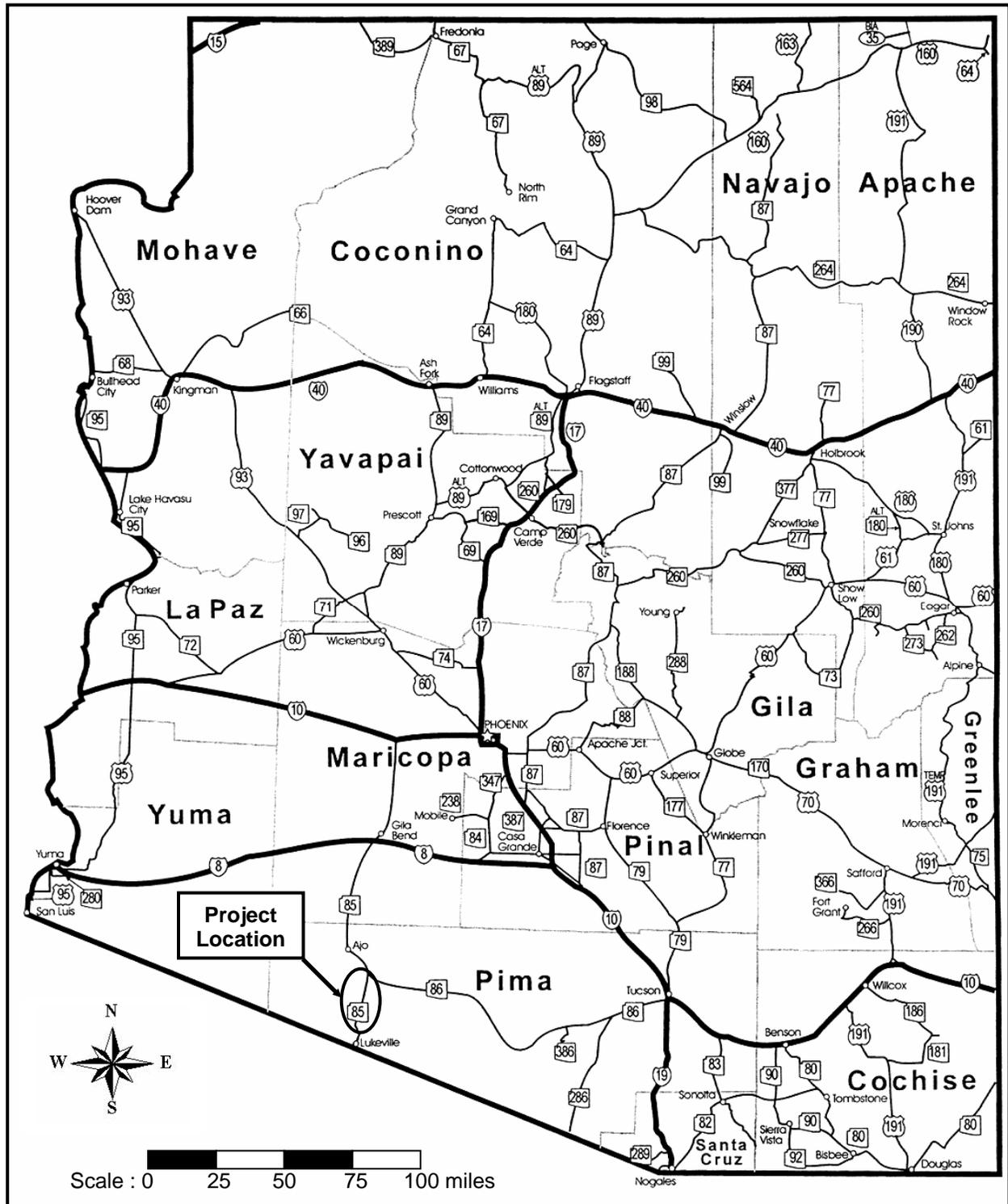


Figure 1. State Map with Project Location

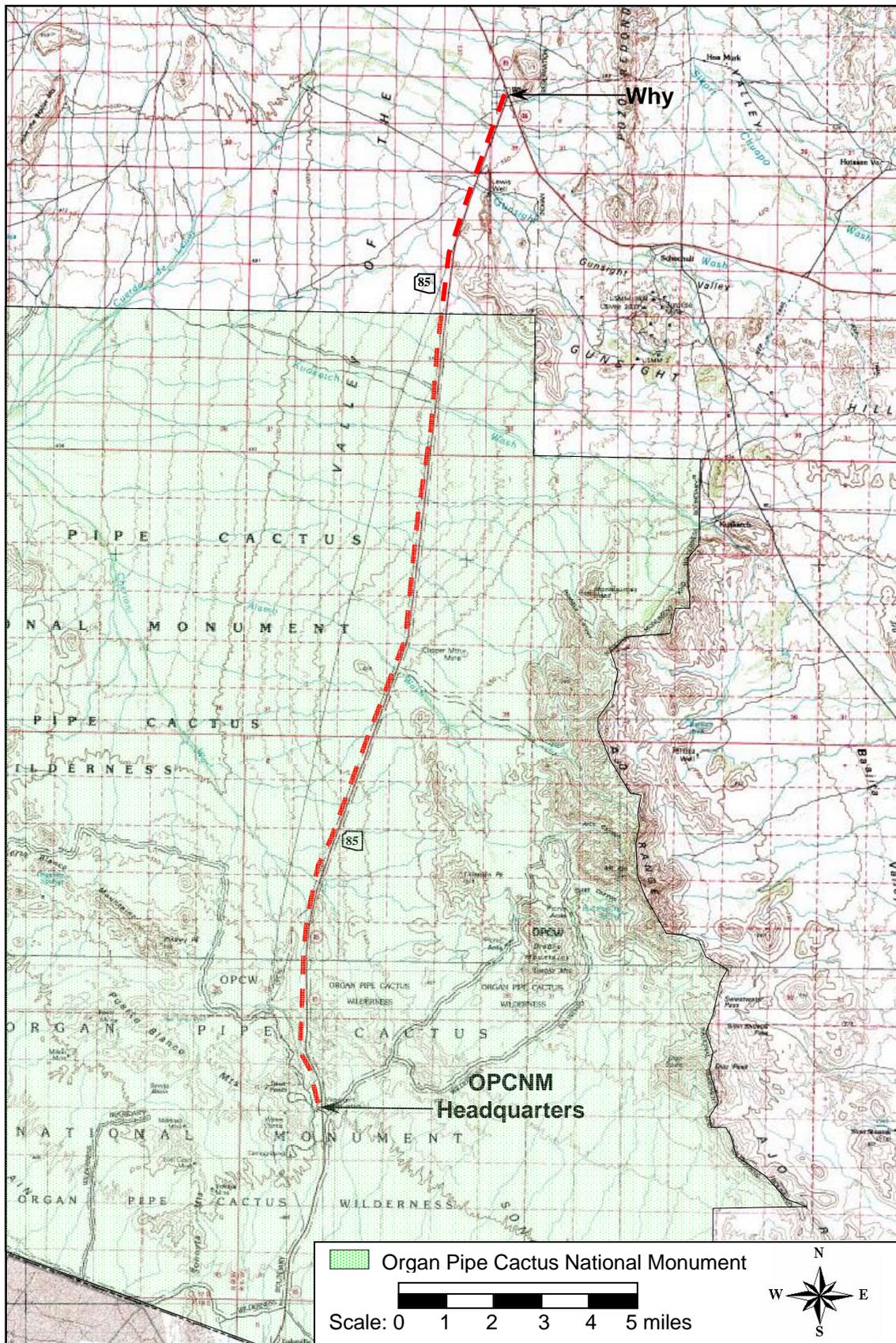


Figure 2. Vicinity Map with Project Location

LEGISLATIVE MANDATES

Various agencies have been contacted and consulted as part of this planning and environmental analysis effort. Appropriate federal, state, and local agencies have been contacted for input, review, and permitting in coordination with other legislative and executive requirements.

Monument Mission and Goals

Organ Pipe Cactus National Monument (OPCNM) was established on April 13, 1937, to preserve more than 330,000 acres and protect a representative part of the Sonoran Desert that contained organ pipe cactus (*Stenocereus thurberi*). In 1976, OPCNM was designated an international biosphere reserve by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) under the direction of the Man and the Biosphere Program. Approximately 95% of the monument (about 312,600 acres) was designated as wilderness in 1978 (Public Law 95-625). Wilderness is an area "...where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain..." and "...which is protected and managed so as to preserve its natural conditions..." (Public Law 88-577). Management of wilderness must comply with the Wilderness Act of 1966 and NPS wilderness management policies.

Federal Regulations and Guidance

Construction of the proposed project would be in compliance with all federal regulations, including legislation and guidance from the RUS, Department of Interior, NPS, and OPCNM. Several national laws, regulations, and NPS legal mandates have provided guidance for this document. A review of these mandates and commitments is provided in this section. Legislative mandates include those measures that apply to the entire NPS, plus monument-specific requirements.

The NPS and its mandates are authorized under the NPS Organic Act (1916) (16 USC 1-18f) and the General Authorities Act (1970) (16 USC 1a-8) which direct the agency to conserve the scenery, the natural and historic objects, the wildlife, and to provide for the enjoyment of those resources in such a manner as to leave them unimpaired for future generations. The Redwood National Park Expansion Act (1978) (16 USC 1a-1) reasserted the system-wide standard of protection established by the Organic Act by stating that the NPS must conduct its actions to ensure that no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."

The National Environmental Policy Act (NEPA) requires federal agencies to consider alternatives, analyze the impacts of those alternatives, and to mitigate the effects of their decisions on the environment. The act is implemented through regulations of the Council on Environmental Quality (CEQ) (40 CFR 1500–1508). In order to comply with NEPA and the CEQ regulations, the NPS has adopted the procedures found in Director's Order #12 (DO-12): Conservation Planning, Environmental Impact Analysis, and Decision-making (NPS 2001) and its accompanying handbook. Impacts of the alternatives considered in this document were assessed in accordance with DO-12 which requires that impacts of proposed actions on park resources be analyzed in terms of their context, duration, and intensity. The following additional documents provide further direction for the protection of the natural abundance and diversity of all of OPCNM's naturally occurring communities: the General Management Plan (with supplemental Environmental Impact Statement) (NPS 1998); NPS Management Policies (2001); Procedural Manual #77-2, Floodplain Management (NPS 2002), and; OPCNM's Natural and Cultural Resources Management Plan (NPS 1994), and are incorporated by reference.

OPCNM Land Designations

Land designations within OPCNM fall under several different land management classifications. These different land classifications are considered in the environmental assessment for the proposed project. In addition to being designated a National Monument, OPCNM also has an international Biosphere Reserve designation, established in 1976 by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). Further, approximately 312,600 acres of OPCNM were designated as federal wilderness in 1978.

Bureau of Land Management Land Use Plans

As mandated by the Federal Land Policy and Management Act of 1976 (FLPMA), the Bureau of Land Management (BLM) is required to manage public lands under a multiple-use approach. This approach includes the designation of transportation and utility corridors on federal lands where they are necessary for public safety and welfare. The Proposed Alternative is subject to the Approved Amendment to the lower Gila North Management Framework Plan and the Lower Gila South Resource Management Plan and Decision Record (DOI 2005) (See Chapter III for further details).

State Trust Land Designations

The goal of the Arizona State Land Department (ASLD) is to manage State Trust lands and resources to enhance value and optimize economic return for the Trust beneficiaries, consistent with sound stewardship, conservation, and business management principles supporting socioeconomic goals for citizens here today and generations to come. The project limits intersect two ASLD surface parcels just south of Why (sco.az.gov/website/parcels/viewer.htm), and therefore a ROW permit must be obtained from the ASLD. The northern-most parcel is approximately 640 acres (all of Section 36, T13S, R5W) and is part of a grazing allotment (number 10001 with a total of 11,511 acres) that is currently unleased. The southern-most parcel is approximately 80 acres (eastern ½ of northeast ¼ of Section 2, T14S, R5W) and is part of a grazing allotment (number 10002 with a total of 11,454 acres) that is currently leased. The beneficiaries of both surface parcels are Common Schools.

County and Regional Planning Documents

The proposed project is within Pima County and would be designed and constructed in accordance with all applicable county land planning documents. The project is not within the boundaries of the Pima County Sonoran Desert Conservation Plan. The proposed project also lies within the boundaries of the Pima Association of Governments (PAG) Metropolitan Planning Organization. Coordination with PAG would be conducted during the project design and construction as appropriate to ensure compliance with applicable planning documents.

ISSUES AND IMPACT TOPICS

Issues associated with construction of placing a fiber optic line were identified based on: site visits; existing information derived from previous research and development projects; federal laws, regulations, and Executive Orders; NPS Management Policies (2001); project issues; and NPS knowledge of limited or easily impacted resources. A brief rationale for the selection of each impact topic is given below. The issues listed below are further discussed in Chapter III Affected Environment and Environmental Impacts. If no issues are expected based on available information, then the issue was eliminated from further consideration (see IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION).

Soils

The majority of the soils within the project limits are moderately susceptible to detachment, and they produce moderate runoff. The proposed action would disturb soils in the construction area if implemented: the construction could result in soil erosion and impacts such as compaction and trampling.

Vegetation

The vegetative community is characteristic of the Arizona Upland Subdivision of the Sonoran Desertscrub biome (Brown 1994), and the majority of the project limits occurs within the paloverde-mixed desertscrub community. The Proposed Alternative would affect existing vegetation: rare or unusual vegetation could be damaged during construction of trenches; vegetation that provides habitat for threatened, endangered, or special concern species could be damaged during construction, and; construction of trenches could cause the promotion of nonnative species.

Wildlife and Wildlife Habitat

The fauna at OPCNM is as diverse as the flora. The Proposed Alternative would affect wildlife, and wildlife habitat could be degraded due to construction of trenches and presence of machinery.

Threatened, Endangered, and OPCNM Species of Concern

Section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.) requires all federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. NPS policy requires examination of the impacts to federally-listed threatened, endangered and candidate species. In a letter dated 14 July 2006, the USFWS provided technical assistance for two listed species that may occur within the project area: Sonoran pronghorn (*Antilocapra americana sonoriensis*) and lesser long-nosed bats (*Leptonycteris curasoae yerbabuena*) (Appendix A). The RUS initiated consultation with the USFWS, and a concurrence letter is attached (Appendix A). Special status species could respond negatively to the presence of machinery and crews and to noise generated by construction, and habitat for threatened or endangered species could be temporarily degraded due to the construction. It has been determined that the Proposed Alternative may affect but is not likely to adversely affect the Sonora pronghorn. OPCNM wildlife species of concern that live under rocks or in ground burrows within the construction footprint would be displaced by construction activity.

Visitor Use, Understanding, and Appreciation

Visitors come to OPCNM for the peace, beauty, open space and the opportunity for solitude and camping. Alternatives in this document have the potential to variously affect visitor use and safety. Construction and the trench scars could affect the natural or historic viewsapes at OPCNM by disrupting the aesthetic qualities of the natural surroundings, and there would be short-term impacts on visitor use and experience during construction; however, in the long-term, this alternative would have a beneficial effect on visitor use and experience by providing additional, more reliable, and faster telecommunications networking services to the area.

Human Health and Safety

The existing telecommunication system in servicing OPCNM and surrounding area is old and degraded and could limit communications necessary for businesses as well as emergency response to OPCNM and surrounding areas.

Park Management and Operations

Illegal smuggling-related and vehicular activity requires additional park resources (staff and equipment) to apprehend criminals and restore damage to natural resources. Out-dated communication systems in OPCNM could impede OPCNM's management and operations, particularly related to law-enforcement.

Socioeconomics

The local economy is based on government and educational institutions and construction, utility, and tourist related service industries. Communities near OPCNM could experience benefits from increased tourism if visitors felt safer visiting the monument. The Proposed Alternative would improve telecommunications, hence improving communications necessary for businesses as well as emergency response to OPCNM and surrounding areas. Short-term economic benefits from construction-related expenditures due to the Proposed Alternative and employment would provide minimal economic gains for some local and regional businesses and individuals through the purchase of materials, supplies, and services.

Adjacent Lands

OPCNM is bordered by the Tohono O'odham Nation, the Cabeza Prieta National Wildlife Refuge, and by BLM land. The Proposed Alternative would result in the same adverse effects to BLM lands as those effects to OPCNM. The project would not affect the Tohono O'odham Nation or the Cabeza Prieta National Wildlife Refuge, but it would provide improved telecommunications for future needs of the BLM.

IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION

The following issues and resources were dismissed from further consideration because they are either absent from the project site or there is no potential for impact because of the reasons discussed.

Floodplains

The majority of rainfall occurs in late summer as geographically isolated thunderstorms or in winter as widespread, regional storms. These storms typically produce brief ephemeral flows that quickly infiltrate streambeds, and only rarely is there sufficient runoff to cause flooding in the normally dry washes. These ephemeral washes within the area dissect OPCNM, draining from southeast to northwest in the northern ½ of the project area and draining from northeast to southwest in the southern ½ of the project area. No perennial rivers or streams exist within the project area; however, there are approximately 180 ephemeral washes that cross SR85 through corrugated metal pipes or concrete box culverts within the project area. The largest drainages, and the only officially named washes, in the project area include Gunsight Wash, Kuakatch Wash, Alamo Wash and Cherioni Wash.

The Federal Emergency Management Agency (FEMA), established in 1979 to reduce hazard loss and protect infrastructure from natural hazards, is responsible for the delineation of 100-year floodplain and hazard boundary maps as part of the FEMA Flood Insurance Rate Map Program. Such maps identify flood hazard areas, base flood elevations, and flood insurance risks zones. The FEMA Flood Insurance Rate maps for the project area were reviewed, and the majority of the land within the project area is not within the 100-year floodplain. There is one area within the project limits which has been determined to be within the 100-year floodplain: for approximately 900 feet to both sides of the center of Gunsight Wash (at approximately milepost 55) is a Zone A, 100-year floodplain area for which no base flood elevation has been determined.

The NPS Procedural Manual #77-2: Floodplain Management (NPS 2002) provides agency-specific guidance for implementing Executive Order 11988, "Floodplain Management." The guideline reiterates the NPS policy of preserving floodplain values, minimizing potentially hazardous conditions associated with flooding, and adhering to all federal laws and regulations related to activities in flood-prone areas. According to the guideline, an action class and applicable regulatory floodplain must be identified for a proposed action that is either subject to possible harm from flooding or has the potential for adverse floodplain impacts.

Selection of the Proposed Alternative would result in some construction within the 100-year floodplain at Gunsight Wash. Most of the ground disturbance, however, would occur at the outer edges of the floodplain because the fiber-optics would be bored underground for approximately 600 feet centered on Gunsight Wash; therefore, the impacts to the floodplain would be adverse, localized to certain areas, long term, and negligible (i.e., Floodplains would not be affected, or changes would be either non-detectable or, if detected, would have effects that would be considered slight or local, and would likely be short term.) to minor (i.e., Changes in floodplains would be measurable, although the changes would be small, would likely be short term, and would be localized. No mitigation measure associated with water quality or hydrology would be necessary.) Because there would be no major impacts to floodplains, there would be no impairment of park resources or values due to the selection of the Proposed Alternative; therefore, a Statement of Findings (SOF) does not need to be prepared.

Air Quality

The Clean Air Act (CAA) (1963), as amended (42 U.S.C. 7401 et seq.), requires federal land managers to protect air quality by meeting all federal, state and local air pollution standards. The CAA also requires that federal land managers protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts.

If the Proposed Alternative is selected, local air quality would be temporarily affected by dust and vehicle emissions. Operating construction equipment would result in increased vehicle emissions; however, volatile organic compounds, nitrogen compounds, carbon monoxide and sulfur dioxide emissions would disperse quickly from the construction area because air flow in the project area is good. Hence, these emissions would have a short-term, negligible effect on regional pollutant levels. The machinery and equipment that would be used for the construction of the Proposed Alternative would increase Mobile Source Air Toxics (MSATs), but the increase would be temporary; therefore, no special permit from the Environmental Protection Agency or the State of Arizona is required.

Machinery and equipment would be maintained in good working condition to limit exhaust emissions to regulatory levels. During trenching operations, standard dust-suppression measures (i.e., application of water) would be implemented to minimize the generation of fugitive dust. Once the fiber optic line is installed and operational, there would be no emissions associated with the line.

In summary, if the Proposed Alternative is selected, local air quality would be temporarily degraded by dust generated from road reconstruction activities and emissions from construction equipment. This degradation would be highly localized and last only as long as construction activities occurred. Further, because mitigating measures would be followed during construction of the Proposed Alternative to reduce or eliminate any short-term impacts to air quality, neither overall OPCNM air quality nor regional air quality would be more than negligibly

affected, and no long-term impacts to air quality are anticipated. Therefore, air quality has been dismissed from further consideration.

Soundscapes

In accordance with NPS Management Policies (2001) and Director's Order #47, Natural Sounds (2000), an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound.

Operating equipment and other construction activities would be expected to contribute temporary, minor to moderate noise impacts to the soundscape. The noise is expected to reach up to 90 dB in close proximity to machinery; however, noise generation would be transient and limited to daylight hours and to the areas located next to SR85 where the fiber optic line would be installed. No health issues would occur with regard to noise exposure of the regional population. All equipment would be maintained in good working order and the noise emitted to normal operating levels. The Proposed Alternative is expected to have short-term, negligible adverse impacts; therefore, soundscape management was dismissed from further consideration.

Water Quality and Quantity

The 2001 NPS Management Policies provide direction for the preservation, use, and quality of water originating, flowing through, or adjacent to park boundaries. Subsurface directional boring of the proposed line would prevent any disturbance to riverbeds; therefore, no construction would be conducted in any washes, and impacts to water quality are anticipated to be negligible with mitigation. Storm runoff, peak flow rate and duration, low flow, sediment production, and water quality characteristics would not be affected along the proposed route. The construction techniques to be used in the vicinity of waterbodies (rivers, streams, washes) are described in the attached construction plan (Appendix B). These practices would limit the effect of the project on these areas. No Department of the Army, Corps of Engineers permit would be required for the Proposed Alternative.

No water would be removed from any washes for this project. Water needed for construction and dust control would come from other approved sources and would not be diverted from surface waters. Fueling of all machinery would be conducted only in the equipment staging areas away from waterways. Any spills of hazardous materials, fuel, etc., would be cleaned up immediately, and would not be allowed to flow into drainages. Materials used for cleaning fuel spills and other hazardous materials would be available at the staging sites. To minimize the possibility of petrochemicals from construction equipment seeping into the soil, equipment would be checked frequently to identify and repair any leaks.

Wetlands

Executive Order 11990, Protection of Wetlands, requires federal agencies to avoid, where possible, impacts on wetlands. There are no wetlands within or nearby the project area; therefore, this issue was dismissed from further consideration.

Wilderness, Wild and Scenic Rivers

Approximately 95% of OPCNM was designated as wilderness in 1978; however, because the Proposed Alternative would occur in the ROW alongside SR85, and outside the wilderness boundary, and there are no designated wilderness areas on BLM lands in or near the project area, wilderness values or character would not be impacted. Further, there are no designated wild and scenic rivers in the project area. Negligible adverse impacts on values contributing to

the monument's designation as a biosphere reserve would be anticipated. These issues were dismissed from further consideration.

Cultural Resources

The actions described in this document are subject to section 106 of the National Historic Preservation Act, under the terms of the 1995 Servicewide Programmatic Agreement among the NPS, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers (SHPO). The National Historic Preservation Act, as amended in 1992 (NHPA, 16 USC 470 et seq.), NEPA, the 1916 NPS Organic Act, and NPS planning and cultural resource guidelines call for the consideration and protection of cultural resources listed on or eligible for listing on the National Register of Historic Places (including archaeological resources, prehistoric and historic structures, cultural landscapes, ethnographic resources, and museum collections). The evaluation of potential impacts of the Proposed Alternative on significant historic properties is required by NEPA and NHPA, as is attention to the provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) for sites where human remains or burials may be present. An assessment of effect was submitted to the Arizona SHPO for review and comment for the following cultural resources.

Archeological Resources - A Class I and III cultural resource survey of the proposed corridor resulted in the identification of nine previously documented archaeological sites (Steere 2006). No new cultural resources sites were located. Of the nine sites encountered, three sites are recommended as eligible to the National Register of Historic Places (National Register). One site is recommended as potentially eligible to the National Register. Another five sites are recommended ineligible to the National Register. These sites were either sufficiently recorded or lacked adequate integrity, and, therefore, can provide little or no information relevant to understanding the history or prehistory of southeastern Arizona.

Sites recommended as ineligible to the National Register need not be avoided, and the State Historic Preservation Office (SHPO) did not respond within the required 30-day period (Appendix C), so it was assumed that SHPO has concurred with these recommendations; however, OPCNM will reinitiate consultation with SHPO. None of the sites that are recommended eligible or potentially eligible would be either directly or indirectly impacted by the preferred alternative because they will be bored under or trenched around; however, to ensure that no impacts would occur to these resources, the following conditions are required:

1. All known cultural resource sites will be identified on project plans and flagged within the project limits and they will be bored under or trenched around.
2. If previously unidentified cultural resources are encountered during construction activities, the contractor will immediately stop work at that location, take all reasonable steps to secure the preservation of the resources, notify OPCNM staff, and make arrangements for the proper treatment of those resources.
3. OPCNM archaeologists will be available to assist with cultural clearance in the event cultural resources are uncovered during this construction. The resident engineer will notify the monument's Vanishing Treasurer's archeologist at (520.387.6849 x7120) a minimum of five days prior when work will take place at archeological sites identified under the cultural resource survey.

Provided that these conditions are met, the determination of no historic properties affected was made.

Ethnographic Resources - Ethnographic resources are defined by the NPS as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (Director's Order 28: 181). The Tohono O'odham, Hia-Ced O'odham, and other regional tribal groups maintain cultural connections with the monument, and occasionally gather plants there for food, medicine, and ceremonial purposes. The 1937 proclamation establishing OPCNM retained tribal rights to harvest fruit from the organ pipe and other cacti.

The Proposed Alternative is anticipated to temporarily, negligibly disturb potential ethnographic resources such as cacti and other plants traditionally important to the culturally affiliated tribes. The diversity and abundance of these plants would remain elsewhere in the monument. Tribal rights to procure cacti and other plants within the monument would also not be affected. Tribal consultation was conducted, and the tribes did not identify any ethnographic sites within the project limits. Copies of the environmental assessment would be forwarded to each affiliated tribe or group for review and comment. Ethnographic resources are therefore dismissed from further consideration.

Historic Structures - The OPCNM Visitor Center and headquarters building is potentially eligible for the National Register of Historic Places in the context of NPS Mission 66 architectural design; however, these structures are not in the project area and the Proposed Alternative would not affect the building nor diminish their potential National Register eligibility. Therefore, discussion of historic structures was dismissed from further consideration.

Cultural Landscapes - Cultural landscapes are broadly defined by the NPS as, "a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions (Director's Order 28: 87)." The Proposed Alternative would not appreciably affect topography, vegetation, spatial organization, or land use patterns associated with the landscape. In addition, any audible and atmospheric intrusions associated with construction would be temporary and negligible, lasting only as long as construction. Because the integrity of the existing landscape would be largely unaffected, cultural landscapes was dismissed from consideration.

Prime and Unique Farmlands

In August, 1980, the Council on Environmental Quality (CEQ) directed that federal agencies must assess the effects of their actions on farmland soils classified by the U. S. Department of Agriculture's Natural Resource Conservation Service as prime or unique. Prime or unique farmland is defined as soil which particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. There are no prime and unique farmlands associated with the project area; therefore, this resource was dismissed from further consideration.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts to Indian Trust Resources from a proposed action by Department of Interior (DOI) agencies be explicitly addressed in environmental documents. The Federal Indian Trust responsibility is a legally enforceable fiduciary obligation on the part of the U. S. to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaskan native tribes. Indian Trust Resources do not exist at OPCNM; monument

lands are not held in trust by the Secretary of the Interior for the benefit of American Indians. Therefore, this impact topic was dismissed from further consideration.

Environmental Justice

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to the U.S. Environmental Protection Agency (EPA), environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. The Proposed Alternative would not have disproportionately high health or environmental effects on minorities or low-income populations or communities as defined in the EPA's Draft Environmental Justice Guidance (July 1996); therefore, environmental justice was dismissed from further consideration.

Geohazards

Geohazards are any geological or hydrological process that poses a threat to people and/or their property, such as earthquake, landslide, flooding, volcanic eruption or tsunami. There are no known geohazards in the project vicinity; therefore, this topic was dismissed from further consideration.

Streamflow Characteristics

Because the proposed project would not trench in streambeds, but would bore beneath streams and rocky areas, streamflow characteristics would not be impacted. Boring mitigation measures are discussed in the attached construction plan (Appendix B). This issue was, therefore, dismissed from further consideration.

Marine or Estuarine Resources

Marine and estuarine resources are absent from project area and are, therefore, dismissed from further consideration.

Unique, Essential or Important Fish or Fish Habitat

Unique, essential or important fish or fish habitat are absent from project area and are, therefore, dismissed from further consideration.

Sole Source Aquifers

There are not any sole source aquifers, as defined by the EPA, in the project area. This resource was, therefore, dismissed from further consideration.

Mineral Resources

Mineral resources are absent from project area and are, therefore, dismissed from further consideration.

Geothermal Resources

Geothermal resources are absent from project area and are, therefore, dismissed from further consideration.

Paleontological Resources

Paleontological resources are absent from project area and are, therefore, dismissed from further consideration.

Energy Resources

The construction would be scheduled so that it does not interfere with bi-annual transport of the nuclear generator through OPCNM along SR85; therefore, this topic was dismissed from further consideration.

II. ALTERNATIVES CONSIDERED

NO-ACTION ALTERNATIVE

The No-Action Alternative describes the action of the region continuing to use the existing antenna-based telecommunications system. The No-Action Alternative provides a basis for comparing the management direction and environmental consequences of the Proposed Alternative. Should the No-Action Alternative be selected, current and future needs and conditions associated with the regional telecommunications would be addressed through means other than the Proposed Alternative. Telecommunications serving the region would continue to be outdated, and potentially even obsolete, and the system would continue to limit reliability, speed and capacity of communications for OPCNM, local law enforcement, emergency responders, and other TTTC customers.

PROPOSED ALTERNATIVE

The Proposed Alternative would install 22 miles of buried fiber optics line on the west side of SR85 between Why and OPCNM headquarters, within unincorporated Pima County, Arizona in portions of: Township 13 South, Range 5 West, Sections 25, 35 and 36; Township 14 South, Range 5 West, Sections 2, 11, 14, 23, 26, 27 and 34; Township 15 South, Range 5 West, Sections 3, 10, 15, 22, 27, 33 and 34; Township 16 South, Range 5 West, Sections 4, 8, 9, 17, 20, 29 and 32, and; Township 17 South, Range 5 West, Sections 5 and 8. The project limits lie mostly within OPCNM, but also cross portions of Arizona State Trust lands, BLM lands, and private lands.

The project includes construction, operation, and maintenance of a telecommunications cable and ancillary facilities. It is estimated that the trench that would be dug for the fiber optics would be 36 inches deep by one foot wide. The impacted area as a result of digging the trench (i.e., to accommodate equipment) will be no more than 10 feet wide. Trenches would be dug using a vibratory plow. Trenches would not be dug through washes and areas with rocky substrates; rather the fiber optics line would be bored under washes and through rocky areas using a horizontal directional drilling rig. To minimize disturbance, all construction equipment will be rubber-tracked and will avoid impacts to and navigate around sensitive areas (i.e., washes, cultural sites, and sensitive plants). The fiber optics would be placed at least 12 feet from the edge of SR85 asphalt, with a maximum distance of disturbance at 30 feet from the edge of asphalt. Ingress and egress routes to and from the construction sites will be required approximately every ½ mile, and the ingress/egress routes for trenching equipment will use the ingress/egress routes previously used by boring equipment; these locations would be approved by OPCNM personnel prior to construction. The total project disturbance would be less than 27 acres (22 miles [116,160 feet long x 10 feet wide = 1,161,600 feet²] + 44 ingress/egress routes [44 x 10 feet wide x 20 feet long = 8,800 feet²] = 1,170,400 feet²).

The cable would be a 48-pair fiber optic line with a protective sheathing, encased in a 1.5-inch conduit, and would be completely dielectric and would not emit any noise or electric magnetic fields. Ancillary facilities would include underground cable splice vaults, or "handholes", located approximately every four miles. The vaults are 36 inches by 36 inches by 48 inches, with a composite concrete construction, light duty traffic-bearing lid and no attached base. The unit would be completely buried to restrict access, but the vault locations would be marked for maintenance, repairs, and expansion needs. Maintenance and repairs at these vaults will be limited to foot-traffic only.

The proposed project would be completed in two phases: Phase I would include placing the conduit and ancillary facilities underground, and Phase II would include the pulling and splicing of the communications cable through the conduit and any necessary final restoration and cleanup operations (See Appendix B for additional information).

MITIGATING MEASURES

These mitigating measures would be implemented by TTTC, their design consultant, the contractor or the NPS and/or incorporated into the project construction documents.

TTTC Design Responsibilities

1. The TTTC design consultant would ensure that the contractor complies with all mitigation measures specified in this Draft Environmental Assessment. Mitigation measures will be included in the contractor's design and engineering plans.
2. The TTTC design consultant would prepare the Storm Water Pollution Prevention Plan (SWPPP) for the project. TTTC, in consultation with OPCNM (520.387.6849), would review and approve the SWPPP.
3. The TTTC design consultant would submit the Arizona Pollutant Discharge Elimination System (AZPDES) Notice of Intent and the Notice of Termination to the Arizona Department of Environmental Quality (ADEQ).
4. The TTTC design consultant would include staging areas in the construction and engineering plans. The TTTC design consultant, with approval from OPCNM (520.387.6849), will approve the location of temporary construction fencing and staking prior to the start of construction. Prior to the start of construction, the TTTC design consultant, in consultation with OPCNM (520.387.6849), would inspect staking (i.e., construction line will be painted on the ground) to ensure that staking are in their proper location.
5. The TTTC design consultant will work with a qualified biologist to develop a site restoration plan, which meets OPCNM and NPS standards, to restore disturbed lands.
6. During construction, the design consultant would supervise the contractor while transplanting salvaged plant material to within the or nearby areas of construction disturbance.
7. To minimize impacts to the cactus ferruginous pygmy-owl (pygmy-owl), lesser long-nosed bat, and Sonoran pronghorn, no construction activities will occur from March 15 through July 31 within OPCNM boundaries. Construction may occur north of OPCNM (outside Sonoran pronghorn habitat) during this time frame.
8. The resident engineer and construction crews will be trained to identify pronghorn and scan for them regularly when construction occurs within the pronghorn range. Additionally, the engineer will be in regular communication with OPCNM and/or the Arizona Game and Fish Department (AGFD) to obtain the most recent pronghorn locations, if any, in the project vicinity.
9. If construction activities are not complete prior to 1 February 2008, and the pygmy-owl is relisted, surveys would be conducted of all potential pygmy-owl nesting habitat within 400 meters of the project prior to continuing construction.
10. Prior to construction, the TTTC design consultant will coordinate with OPCNM (520.387.6849), to identify specific areas available for temporary storage and staging of construction equipment, vehicles, and materials. The TTTC design consultant will obtain prior approval from OPCNM (520.387.6849), before the contractor can begin storing or staging outside of previously identified staging sites.
11. The TTTC design consultant will work with OPCNM staff to identify access routes for ingress and egress of all motorized vehicles.

Organ Pipe Cactus National Monument Responsibilities

1. OPCNM will monitor construction areas within the monument for invasive species throughout project construction and the two-year plant establishment period. If invasive species are identified, OPCNM will notify TTTC.
2. OPCNM archaeologists will be available to assist with cultural clearance in the event cultural resources are uncovered during this construction. The resident engineer will notify the monument's Vanishing Treasurer's archeologist at (520.387.6849 x7120) a minimum of five days prior when work will take place at archeological sites identified under the cultural resource survey.
3. OPCNM reserves the right to cease operations at any time if unacceptable impacts to natural and cultural resources are observed or the mitigation measures are violated.

Contractor Responsibilities

4. Mitigation measures will be included in the contractor's design and engineering plans.
5. The contractor must comply with all requirements identified in the SWPPP to minimize erosion and release of pollutants into surface waters.
6. The contractor will install temporary fencing to delineate staging area boundaries. Throughout construction, the contractor would be responsible for maintaining staking in good condition and in its proper location.
7. No construction equipment, vehicles, or personnel will be permitted outside of the established construction limits, including parking outside the existing shoulder on SR85. Staging areas and exit and entry corridors for equipment access should be identified in the document drawings and explained in the document.
8. Excess rock disturbed by the vibratory plow will be left on site.
9. The contractor will adhere to the site restoration plan, which meets OPCNM and NPS standards, to restore disturbed lands.
10. Large columnar cacti (i.e., saguaro [*Carnegiea gigantea*] and organ pipe cactus [*Stenocereus thurberi*] (≥ 3.5 feet tall); large barrel cacti (*Ferocactus* spp.) (≥ 2 feet tall), and; trees (i.e., velvet mesquite [*Prosopis velutina*], ironwood [*Olneya tesota*], foothill paloverde [*Parkinsonia microphylla*], blue paloverde [*P. florida*], and desert hackberry [*Celtis pallida*] (≥ 4 inches diameter at one foot above soil surface) will not be removed or transplanted and will be: trenched around or trimmed (trees only). All desert queen of the night (*Peniocereus greggii* var. *transmontanus*), small columnar cacti (< 3.5 feet tall), and small barrel cacti (< 2 feet tall) will be transplanted. Each species transplanted will be marked with an identification tag and number. The contractor will provide OPCNM staff with a report on the identification number, species, and original and relocated geographic coordinates for each species transplanted. The contractor will work with OPCNM staff on identification of species to be salvaged.
11. Small trees (< 4 inches diameter at one foot above soil surface) that would be removed or trimmed include the following species: velvet mesquite, ironwood, foothill paloverde, blue paloverde, and desert hackberry. Tree stumps ≤ 12 feet of the highway edge (ADOT clear zone) will be treated with an herbicide to prevent regrowth; tree stumps > 12 feet from the highway edge will not be treated with an herbicide. Large shrubs such as creosote bush (*Larrea divaricata*), Mexican jumping bean (*Sapium biolculare*), catclaw acacia (*Acacia greggii*) or whitethorn acacia (*A. constricta*) also would be removed from the trenched area. All woody plant slash that is cleared will be replaced on the disturbed zone after construction.
12. Within the established construction limits, to the extent feasible, the contractor will limit the removal of any plants that have not been marked for salvage.

13. In accordance with planting plans included in the contractor's packet, the contractor must transplant salvaged plant material to areas within or immediately adjacent to construction disturbance (within 20 feet to the west of the construction footprint).
14. In compliance with Executive Order 13112 regarding invasive species, the contractor must wash all vehicles at the contractor's storage facility prior to arriving on-site to prevent the introduction of invasive species seed.
15. If invasive species are identified, OPCNM will notify TTTC, and require that the contractor treat the site(s) in accordance with the method specified by OPCNM and comply with NPS requirements for the application of herbicides.
16. To minimize impacts to the pygmy-owl, the lesser long-nosed bat, or the Sonoran pronghorn, no construction activities will be permitted from March 15 through July 31 within OPCNM boundaries; construction may occur north of OPCNM (outside Sonoran pronghorn habitat) during this time frame.
17. Construction crews will adhere to the following plans regarding encounters with threatened, endangered and sensitive species such as: Sonoran pronghorn, pygmy-owls, Mexican rosy boa (*Lichanura trivirgata*), rattlesnakes, and Gila monsters (*Heloderma suspectum*).
 - a. Construction crews will not kill, harm, harass, or feed wildlife.
 - b. Construction crews will use best safety practices when working around poisonous reptiles; if a poisonous reptile can not be avoided, construction crews will contact monument staff to remove them from the project area.
 - c. The resident engineer and construction crews will scan for the presence of Sonoran pronghorn on a regular basis when construction activities occur in pronghorn habitat. Additionally, the engineer will be in regular communication with OPCNM and/or AGFD to obtain the most recent pronghorn locations, if any, in the project vicinity. If Sonoran pronghorn are encountered, construction crews will stop all activity and allow the pronghorn to move away in the direction and at the speed of their choosing. If pronghorn do not move from the area within three hours, construction crews will slowly turn around and retreat from them, if at all possible. If retreat (even temporary) is not possible, construction crews will continue on their current route at a slow speed (<15 mph for vehicles), as long as this is not toward the pronghorn. Construction crews will continue at a slow speed until they are greater than one mile (1.6 km) from the animals or have put a topographic barrier (e.g., a ridgeline) between themselves and the pronghorn. Construction crews will not pursue or approach pronghorn in any way. If at all possible, construction crews will obtain the mileposts of the sightings and report this information, along with group size, general location, and direction of travel to Tim Tibbitts, 520.387.6849 x 7114 or Mary Kralovec, 520.387.6849 x 7110.
 - d. If a pygmy-owl, lesser long-nosed bat or Acuña cactus are detected in the work area, they will not be disturbed, and construction crews will provide a report with the GPS coordinates, if possible, or general location to OPCNM staff.
18. The project construction would adhere to the AGFD recommendations regarding open trenches (Appendix D).
19. If desert tortoises are encountered during construction, the contractor will handle these individuals in accordance with the attached AGFD Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects (Appendix D).
20. If previously unidentified cultural resources are encountered during construction activities, the contractor will immediately stop work at that location, take all reasonable steps to secure the preservation of the resources, notify OPCNM staff, and make arrangements for the proper treatment of those resources.
21. The contractor must control traffic in accordance with Part VI of the Arizona Department of Transportation (ADOT) Manual on Uniform Traffic Control Devices for Streets and Highways, published by the United States Department of Transportation, Federal Highway

- Administration (1993), Traffic Control Supplement (1996), and/or associated provisions in the project plans, as determined by the ADOT Traffic Design Section during design.
22. Construction activities that would impact traffic flow will be scheduled by the contractor to avoid Fridays, Saturdays, Sundays, and holidays throughout the year.
 23. Prior to construction, the contractor will coordinate with OPCNM (520.387.6849) to identify specific areas available for temporary storage and staging of construction equipment, vehicles, and materials. The contractor will obtain prior approval from the OPCNM (520.387.6849), before storing or staging outside of previously identified staging sites.
 24. The contractor will obtain all required construction water from a source outside OPCNM boundaries.
 25. The contractor will comply with the Water Quality Standards in Title 18, Chapter 11 of the Arizona Administrative Code as administered by the ADEQ.
 26. The contractor must control, reduce, remove, or prevent air pollution in all its forms, including air contaminants, in the performance of the contractor's work in accordance with the Air Quality Standards in Title 18, Chapter 2 (Air Pollution Control) of the Arizona Administrative Code as administered by the ADEQ.
 27. The contractor must apply water to control dust during construction.
 28. The contractor must control construction noise in all its forms in accordance with local rules or ordinances.
 29. If previously unidentified or suspected hazardous materials are encountered by the contractor during construction, work must cease at that location. The contractor must coordinate with OPCNM to arrange for proper assessment, treatment, or disposal of those materials. Such locations must be investigated and proper action implemented prior to the continuation of work in that location.
 30. The contractor would follow the standard TTTC spill prevention and contingency plan and a waste management plan during the construction and cleanup phase of the project. The plan identifies and quantifies all on-site hazardous and petroleum substances that would be used and could be available during these phases. Recommended practices and emergency response procedures are also outlined in the plan. Fuel and lubricants are the only anticipated hazardous materials to be used during construction. Equipment oil changes would be performed at staging areas and not on public land. Any waste oil generated would be handled, stored, and disposed of according to applicable regulations. Any fuel or oil spills or leaks would be cleaned up and/or repaired immediately. Any bentonite (i.e., clay used for drilling) spills will be removed with a vacuum truck.
 31. The contractor must dispose of all excess waste material and construction debris outside OPCNM boundaries at either municipal landfills approved under Title D of the Resource Conservation and Recovery Act, construction debris landfills approved under Article 3 of the Arizona Revised Statutes 49-241 (Aquifer Protection Permit) as administered by the ADEQ, or inert landfills.
 32. It is anticipated that only non-hazardous wastes, including waste oil, would be generated during the project. Empty conduit and cable reels would be removed from the job site weekly. Damaged cable, empty boxes, and blowing trash would be removed from the job site daily. All crews would be responsible for leaving the work area each night as clean as or better than before entering the area and would report to appropriate agencies any uncovering of hazardous materials by the trenching machines. Cleanup would take place during the plow operations behind the pulling crews. Equipment would consist of a trenching machine, a plow, a boring rig, truck, and in given situations, a road sweeper.
 33. The contractor would furnish portable field toilets for each crew.
 34. A traffic control plan conforming to ADOT standards would be in place prior to construction, and appropriate traffic control measures would be applied.
 35. All personnel would be safety trained prior to beginning work.

ALTERNATIVES CONSIDERED BUT DISMISSED

The following alternatives were considered but were dismissed for the reasons discussed below:

1. The first alternative that was considered but dismissed was to place the fiber optics line west of the SR85 alignment, within OPCNM, along an existing aerial communications line. It was determined that this alternative was not feasible because it would occur within an area that is less disturbed than the proposed alternative potentially resulting in increased impacts to the environment (e.g., Sonoran pronghorn). Further, the personnel responsible for construction and maintenance of the line would have to work in a remote area that may be unsafe in which to work because it is known for high rates of people and drug smuggling.
2. The second alternative that was considered but dismissed was to place the fiber optics line within the road prism of SR85 to avoid disturbing the environment outside the asphalt or the cleared shoulder. It was determined that this alternative was not feasible because a right-of-way permit must be obtained from the Arizona Department of Transportation, and they stated that a permit will only be issued for a project that is at least 12 feet from the edge of asphalt.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is defined by the CEQ as the alternative that best meets the following criteria or objectives, as set out in Section 101 of NEPA:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
2. Ensure for all Americans a safe, healthful, productive, and aesthetically and culturally pleasing surroundings.
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, whenever possible, an environment that supports diversity and variety of individual choice.
5. Achieve a balance between population and resource that will permit high standards of living and a wide sharing of life's amenities.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The No-Action Alternative would not contribute adverse impacts to cultural and natural resources in the project area, thereby meeting goals 1 and 4; however, because it would not improve existing conditions that adversely affect visitor experience and safety, it would not meet goals 2, 3, or 5. The No-Action Alternative also would not satisfy the purpose and need for the proposed action.

The Proposed Alternative would place a fiber optics line at least 12 feet from the edge of SR85 asphalt, with a maximum distance of disturbance at 30 feet from the edge of asphalt and would utilize rubber-tracked construction equipment to minimize disturbance. Because the project area is a transportation corridor, the project limits include or are adjacent to land that is subject to routine, periodic highway operation and maintenance activities that have reduced the natural quality of the roadside environment. The Proposed Alternative would occur on previously-disturbed land where possible, minimizing potential adverse impacts to natural and cultural resources. Further, washes and adjacent riparian vegetation would be bored under and large stands of trees and columnar cacti would be bored under or trenched around, vegetation

removal will be limited to the maximum extent possible, and small cacti will be transplanted near the project limits. Cultural resource surveys of the project area indicate that cultural resources exist within the project limits; however, the proposed construction activities would avoid these cultural resources.

Implementation of this alternative would cause short- to long-term, negligible to moderate, site specific to regional, adverse impacts. Implementation of this alternative would also result in beneficial, localized to regional, short- and long-term, moderate impacts to: visitor use and experience; the monument's management and operations; human health and safety; socioeconomics (including visitation), and; future communications on BLM lands. This alternative would meet goals 2, 3, 4 and 5.

Based on the information and analysis prepared in this DEA, the Proposed Alternative is considered the environmentally preferred alternative because it surpasses the No-Action Alternative in realizing the *fullest range* of national environmental policy goals as stated in §101 of NEPA.

The Proposed Alternative would: a) assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings, b) attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences, c) preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice, and d) achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.

SUMMARIES

Table 1. Comparison of Alternatives

NO-ACTION ALTERNATIVE	PROPOSED ALTERNATIVE
<p>The region would continue to use the existing antenna-based telecommunications system. Current and future needs and conditions associated with the regional telecommunications would have to be addressed through means other than the Proposed Alternative. Telecommunications serving the region would continue to be outdated, and potentially even obsolete, and the system would continue to limit reliability, speed and capacity of communications for OPCNM, local law enforcement, emergency responders, and other TTTC customers. The No-Action Alternative would not adequately address the project purpose and need of replacing the outdated antenna system and providing improved safety for residents and visitors in the region and additional, more reliable, and faster telecommunications networking services, including high-speed connections, which are required in today's environment for educational, medical, and business purposes. The proposed project is needed because the current telecommunications system serving the region is outdated because it utilizes an antenna, and replacement parts for this system are not available. This project will not meet the needs of improving: reliability, speed and capacity; OPCNM communications; law enforcement ability of the OPCNM Park Rangers, U.S. Border Patrol, U.S. Customs, the Sheriff Department, and the Department of Public Safety, and; service to other TTTC customers.</p>	<p>The proposed action would include the following elements:</p> <ul style="list-style-type: none"> • Installing 22 miles of buried fiber optics line on the west side of SR85 between Why and OPCNM headquarters, within OPCNM, BLM lands, Arizona State Trust lands, and private lands, within unincorporated Pima County, Arizona. • Construction, operation, and maintenance of a telecommunications cable and ancillary facilities. • The impact as a result of digging the trench (i.e., to accommodate equipment) will be no more than 10 feet wide. • Trenches would not be dug through washes and areas with rocky substrates; rather the fiber optics line would be bored under washes and through rocky areas. • The fiber optics would be placed at least 12 feet from the edge of SR85 asphalt, with a maximum distance of disturbance at 30 feet from the edge of asphalt. • The total project disturbance would be less than 27 acres (22 miles [116,160 feet long x 10 feet wide = 1,161,600 feet²] + 44 ingress/egress routes [44 x 10 feet wide x 20 feet long = 8,800 feet²] = 1,170,400 feet²). • Ancillary facilities would include underground cable splice vaults, or "handholes", located approximately every four miles. • The proposed project would be completed in two phases: Phase I is placing the conduit and ancillary facilities underground, and Phase II would include the pulling and splicing of the communications cable through the conduit and any necessary final restoration and cleanup operations. <p>The Proposed Alternative meets the project purpose and need of replacing the outdated antenna system and providing improved safety for residents and visitors in the region and additional, more reliable, and faster telecommunications networking services, including high-speed connections, which are required in today's environment for educational, medical, and business purposes. The proposed project is needed because the current telecommunications system serving the region is outdated because it utilizes an antenna, and replacement parts for this system are not available. This project will meet the needs of improving: reliability, speed and capacity; OPCNM communications; law enforcement ability of the OPCNM Park Rangers, U.S. Border Patrol, U.S. Customs, the Sheriff Department, and the Department of Public Safety, and; service to other TTTC customers.</p>

Table 2. Comparison of Environmental Impacts

IMPACT TOPIC	NO-ACTION ALTERNATIVE	PROPOSED ALTERNATIVE
Soils	Soils would not be impacted.	Adverse, localized, long-term, moderate impacts to soils would occur.
Vegetation	Vegetation communities would not be impacted.	Adverse, localized, long-term, moderate impacts to the Sonoran Desert biotic community would occur.
Wildlife and Wildlife Habitat	Wildlife would not be impacted.	Adverse, localized, short- and/or long-term, moderate impacts to wildlife would occur.
Threatened, Endangered, and OPCNM Species of Concern	Threatened, Endangered, and OPCNM Species of Concern would not be impacted.	Adverse, localized to regional, short-term, minor impacts to Sonoran pronghorn would occur, and it <i>may affect, but would not likely adversely affect</i> this species. Adverse, localized, short-term, negligible impacts to the lesser long-nosed bat and the pygmy-owl would occur, and no impacts to Acuña cactus would occur. Adverse, localized, short- and/or long-term, negligible to moderate impacts to OPCNM Species of Concern would occur.
Visitor Use, Understanding, and Appreciation	Adverse, regional, long-term, minor to moderate impacts to visitors would occur. Adverse, regional, long-term, minor to moderate cumulative impacts to visitors would also be expected.	Adverse, localized, short-term, minor impacts on visitor use and experience would occur during construction, and adverse, localized, long-term, moderate impacts would occur to visitors' views from SR85; however, beneficial, regional, long-term, moderate impacts on visitor use and experience would occur by providing additional, more reliable, and faster telecommunications networking services to the area.
Human Health and Safety	Adverse, regional, long-term, moderate and cumulative adverse, localized and regional, short- and long-term, minor to moderate impacts to human health and safety would occur.	Beneficial, regional, long-term, moderate impacts and cumulative beneficial, localized and regional, long-term, moderate impacts to human health and safety would occur.
Park Management and Operations	Adverse, localized to regional, long-term, moderate impacts and cumulative adverse, localized and regional, long-term, minor to moderate impacts to the monument's management and operations would occur.	Beneficial, localized to regional, long-term, moderate impacts and cumulative beneficial, localized, long-term, minor impacts to the monument's management and operations would occur.
Socioeconomics	No to negligible impacts to the local and regional socioeconomic conditions would occur.	Beneficial, regional, short-term, moderate impacts and beneficial, regional, short- and long-term, minor to moderate cumulative impacts to socioeconomics (including visitation) would occur.
Adjacent Lands	No to negligible impacts to adjacent lands would occur.	The same impacts to resources on BLM lands as those impacts to resources within OPCNM would occur (see above). Beneficial, localized, long-term, moderate impacts to communications on BLM lands would occur in the future.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

METHODOLOGY FOR ASSESSING IMPACTS

The purpose of this chapter is to describe the existing conditions of the environmental and socioeconomic resources in the project area and to identify the potential impacts that may result from the implementation of the Proposed Alternative or the No-Action Alternative.

Potential impacts are described in terms of type (beneficial or adverse impacts), context (site-specific, local, or regional impacts), duration (short-term, lasting less than one year; or long-term, lasting more than one year), and intensity (negligible, minor, moderate, or major impacts or an impairment).

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). These actions are identified (Appendix E), and cumulative impacts were determined by combining the impacts of alternatives with those of the other projects.

NPS Management Policies require an analysis of potential effects to determine whether or not actions would impair park resources (NPS 2001). The fundamental purpose of the national park system is to conserve park resources and values for the use and enjoyment of future generations. Park managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values. However, the laws do give the NPS managers the discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. That discretion to allow certain impacts within a park is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible manager, would harm the integrity of park resources or values. An impact to any park resource or value may constitute an impairment, but an impact would be more likely to constitute an impairment to the extent that it has a major adverse effect on a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park; or
- Identified as a goal in the park’s general management plan or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. A determination on impairment is made for each resource impact topic.

ENVIRONMENTAL COMPONENTS

General

Organ Pipe Cactus National Monument encompasses 330,000 acres and is located in southwestern Pima County in the Sonoran Desert, the most biologically diverse desert in North America (Arizona-Sonora Desert Museum 2000). OPCNM is the site of the intersection of three

cultures that is significant archaeologically, geographically, and internationally. Summer temperatures often exceed 105° F (40.6° C), and winter temperatures are mild; most visitors to OPCNM come in the late winter and spring months when the temperatures are cooler. Average total rainfall within OPCNM ranges from 6 to 12 inches: half of the annual rainfall is deposited from July through September and the other half from November through April. Elevation within the project limits varies from approximately 1675 to 1975 feet above mean sea level. The majority of the project area is located in the Ajo Mountain foothills on alluvial bajadas where the topography is predominantly flat to gently sloping. The majority of the soils within the project limits are moderately susceptible to erosion, and they produce moderate runoff. There are approximately 180 ephemeral washes that cross SR85 through corrugated metal pipes or concrete box culverts within the project area. The vegetative community is characteristic of the Arizona Upland Subdivision of the Sonoran Desertscrub biome (Brown 1994), and the majority of the project limits occurs within the paloverde-mixed desertscrub community. The diverse wildlife within OPCNM's limits may occur within the project limits and may also include ground-burrowing animals, snakes, and endangered species such as the lesser long-nosed bat and Sonoran pronghorn.

The project area is a transportation corridor, and the project limits include or are adjacent to land that is subject to routine, periodic highway operation and maintenance activities that have reduced the natural quality of the roadside environment. SR85 transverses the monument from north to south and provides the gateway to the U.S. Customs port-of-entry at the international border at Lukeville which is the most traveled route to the Mexico vacation hot-spot of Rocky Point. Law enforcement personnel routinely pursue illegal vehicles along SR85, and drug and people smuggling (and the high-speed chases that accompany such activities) produces the ongoing potential for injury or death to those within the proposed project area.

Soils

Elevation on the project site varies from approximately 1675 to 1975 feet above mean sea level. The majority of the project area is located in the Ajo Mountain foothills on alluvial bajadas where the topography is predominantly flat to gently sloping. Soils in the project area are Hyperthermic Arid Soils with mean annual soil temperatures between 22° and 27° C (72° and 80° F) and between 100 and 250 mm (4 and 10 inches) mean annual precipitation (Hendricks 1985). A variety of soil types exist along the international boundary, as shown in Table 3. Table 3 lists the soils within the project limits and describes the percent of each soil type within the project limits, the slope range, and the erosion factor (K^1) (websoilsurvey.nrcs.usda.gov). The majority of the project limits outside OPCNM occur within the Dateland-Cuerda Complex, Denure-Rillito-Why Complex and the Gunsight-Rillito-Carrizo Complex. Within OPCNM, the majority of the project limits occur within Gunsight very gravelly loam, Harqua-Gunsight complex, and Rillito gravelly sandy loam.

¹ K factor is soil erodibility factor which represents both susceptibility of soil to erosion and the rate of runoff, as measured under the standard unit plot condition. Soils high in clay have low K values, about 0.05 to 0.15, because they are resistant to detachment. Coarse textured soils, such as sandy soils, have low K values, about 0.05 to 0.20, because of low runoff even though these soils are easily detached. Medium textured soils, such as the silt loam soils, have a moderate K values, about 0.25 to 0.40, because they are moderately susceptible to detachment and they produce moderate runoff. Soils having a high silt content are most erodible of all soils. They are easily detached, tend to crust and produce high rates of runoff. Values of K for these soils tend to be greater than 0.40 (www.iwr.msu.edu/rusle/kfactor.htm).

Table 3. Soil Characteristics

Soil Type	Percent of Project Area	Slope Range	Erosion Factor K
Outside OPCNM			
Cipriano-Hyder-Rock Outcrop Complex	0%	15 – 65%	0.24 – 0.32
Dateland-Cuerda Complex	5.7%	0 – 3%	0.28 – 0.32
Denure-Coolidge Complex	1.1%	1 – 3%	0.32 – 0.37
Denure-Rillito-Why Complex	6.3%	1 – 5%	0.28 – 0.37
Gunsight-Rillito-Carrizo Complex	5.8%	1 – 15%	0.24 – 0.37
Huder-Gachado-Gunsight Extremely Gravelly Sandy Loams	0%	1 – 25%	0.20 – 0.37
Within OPCNM			
Ajo very gravelly loam	0.5%	1 – 5%	0.32
Antho fine sandy loam	8.4%	0 – 3%	0.28
Antho soils, very gravelly variants	0.1%	1 – 3%	0.28
Cherioni gravelly very fine sandy loam	0.7%	0 – 8%	0.55
Cipriano gravelly loam	4.5%	0 – 5%	0.32
Gachado extremely cobbly loam	2.1%	2 – 8%	0.32
Gilman very fine sandy loam	0.6%	0 – 3%	0.55
Gunsight very gravelly loam	6.0%	0 – 2%	0.32
Gunsight very gravelly loam	18.2%	2 – 15%	0.32
Harqua-Gunsight complex	15.8%	0 – 3%	0.32
Lomitas extremely stony loam	2.6%	8 – 40%	0.32
Rillito gravelly sandy loam	13.0%	0 – 3%	0.24
Rock land	4.6%	30 – 75%	N/A
Torrifluvents	4.1%	0 – 5%	N/A

The erosion factor (K), as shown in Table 3, indicates the susceptibility of a soil to sheet and rill erosion by water. The higher the value, the more susceptible the soil is to sheet and rill erosion by rain (K values range from 0.20 to 0.55). The majority of the soils within the project limits are moderately susceptible to detachment, and they produce moderate runoff (www.iwr.msu.edu/rusle/kfactor.htm).

Impact Intensity

For this analysis, impact intensities of impacts on soils were derived from available information in recent Environmental Assessments prepared and approved for other federal actions within OPCNM (NPS 2003a and NPS 2003b):

Negligible: Soils would not be affected or the impacts to soils would be below or at the lower levels of detection. Any effects to soil productivity or fertility would be slight and no long-term impacts to soils would occur.

Minor: Impacts to soils would be slight but detectable. Effects to soil productivity or fertility would be small, as would the area affected. If mitigation was needed to offset adverse impacts, it would be relatively simple to implement and would likely be successful.

Moderate: Impact on soil productivity or fertility would be readily apparent, likely long-term, and result in a change to the soil character over a relatively wide area. Mitigation

measures would probably be necessary to offset adverse impacts and would likely be successful.

Major: Impact on soil productivity or fertility would be readily apparent, long-term, and substantially change the character of the soils over a large area in and out of the monument. Mitigation measures to offset adverse impacts would be needed, extensive, and their success could not be guaranteed.

Impairment: A major, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's *General Management Plan* or other relevant NPS planning documents.

Impacts of No-Action Alternative

Under the No-Action Alternative, there would be no project-related ground disturbance with the potential to impact soils. There would be no changes in current conditions of soils, including runoff or permeability as a result of implementing this alternative.

Cumulative Impacts

Impacts to soils in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on soils in the area). In the past, large-scale soil degradation (i.e., erosion) has occurred on much of the rangelands of southern Arizona, and this has dramatically changed the upper soil horizon(s). This has left accumulations of concentrations of coarse fragments on the soil surface, and the smaller sand, silt and clay soil particles have eroded away. These changes in soil composition have likely affected the soil moisture, temperature and other characteristics of soil, which in turn have affected vegetation (Post 1990). The No-Action Alternative would not contribute any project-related ground disturbance or involve other actions that could contribute to adverse cumulative impacts to soils in the region.

Conclusion

The No-Action Alternative would not impact soils and would contribute no or and negligible impacts to soils in the area. Because there would be no major, adverse impacts to soils, there would be no impairment of park resources or values due to the selection of the No-Action Alternative.

Impacts of Proposed Alternative

Soils would be impacted by the presence of construction equipment, excavation, and filling. Approximately 27 acres of soil would be disturbed; however, some of the proposed action would occur on previously disturbed soils. Impacts to soils would be slight but detectable. Effects to soil productivity or fertility would be small, and the area excavated and filled will be less than three acres. If mitigation was needed to offset adverse impacts, it would be relatively simple to implement and would likely be successful; therefore, impacts to soils would be adverse, localized, long-term, and moderate.

Cumulative Impacts

Impacts to soils in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on soils in the area). In the past, large-scale soil degradation (i.e., erosion) has occurred on much of the rangelands of southern Arizona, and this has dramatically changed the upper soil horizon(s). This has left accumulations of concentrations of coarse fragments on the soil surface, and the smaller sand, silt and clay soil particles have eroded away. These changes in soil composition have likely affected the soil moisture, temperature and other characteristics of soil, which in turn have affected vegetation (Post 1990). The impacts of the Proposed Alternative, when combined with past and present actions, would contribute adverse, site-specific, long-term, moderate impacts to soils.

Conclusion

Soils would receive adverse, site-specific, long-term, moderate impacts from implementation of the Proposed Alternative. The effect of placing buried fiber-optics adjacent to SR85, when combined with other past and present actions, would contribute adverse, site-specific, long-term, moderate adverse impacts to soils in the project area. Because there would be no major, adverse impacts to soils, there would be no impairment of park resources or values due to the selection of the Proposed Alternative.

Vegetation (including Riparian Areas)

The vegetative community is characteristic of the Arizona Upland Subdivision of the Sonoran Desertscrub biome (Brown 1994). The majority of the project limits occurs within the paloverde-mixed desertscrub community where vegetation on the uplands is primarily composed of: saguaro (*Carnegiea gigantea*), organ pipe cactus (*Stenocereus thurberi*), ironwood (*Olneya tesota*), foothill and blue paloverde (*Parkinsonia microphylla* and *P. florida*), and ocotillo (*Fouquieria splendens*) in the overstory; creosote bush (*Larrea divaricata*), Mexican jumping bean (*Sapium biloculare*) and cholla cactus (*Cylindropuntia* spp.) in the midstory, and; triangle-leaf bursage (*Ambrosia deltoidea*), barrel cactus (*Ferocactus wislizenii*), and annual grasses and forbs in the understory. Small segments of the project limits near the center of the project occur within the creosote bush/bursage desert community where vegetation on the uplands is primarily composed of: an occasional saguaro in the overstory; creosote bush and an occasional cholla in the midstory, and; bursage (*Ambrosia* spp.) and grasses in the understory. Vegetation in and around the ephemeral washes consists of: ironwood, mesquite, and blue paloverde in the overstory; catclaw and whitethorn acacia (*Acacia greggii* and *A. constricta*), desert hackberry (*Celtis pallida*), creosote bush and desert broom (*Baccharis sarothroides*) in the midstory, and; canyon ragweed (*Ambrosia ambrosioides*) in the understory.

The organ pipe cactus is a large cactus found rarely in the United States (U.S.), although it is common in Mexico. OPCNM encompasses the bulk of its U.S. population. Many species of native flora are of particular concern because they are locally rare or are of interest to poachers and collectors. Cacti of greatest interest include the saguaro, organ pipe, senita (*Pachycereus schottii*), barrel (*Ferocactus* spp.), and desert queen of the night (*Peniocereus greggii* var. *transmontanus*). Other native species of value on the black market include shrubs, trees, and succulents that are either rare or are desirable for landscaping (NPS 1995). The Arizona Native Plant Law protects wild-growing native plants from theft and vandalism through an active public education and enforcement program (Arizona Department of Agriculture 1993). It also provides additional legal protection for the monument's flora.

Invasive species known to occur in the project area include: buffelgrass (*Pennisetum ciliare*), fountain grass (*Pennisetum setaceum*), Sahara mustard (*Brassica tournefortii*), Lehmann's lovegrass (*Eragrostis lehmanniana*), and Bermuda grass (*Cynodon dactylon*) (NPS 2003a).

Impact Intensity

For this analysis, impact intensities of impacts on vegetation were derived from available information in recent Environmental Assessments prepared and approved for other federal actions within OPCNM (NPS 2003a and NPS 2003b):

Negligible: An action that could result in a change to a population or individuals of a species or a resource, but the change would be so small that it would not be of any measurable or perceptible consequence.

Minor: An action that could result in a change to a population or individuals of a species or a resource. The change would be small and localized and of little consequence.

Moderate: An action that would result in some change to a population or individuals of a species or resource. The change would be measurable and of consequence to the species or resource but more localized.

Major: An action that would have a noticeable change to a population or a large number of individuals of a species or resource. The change would be measurable and would result in a severely adverse or major beneficial impact, and a possible permanent consequence, on the species or resource.

Impairment: A major, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's *General Management Plan* or other relevant NPS planning documents.

Impacts of No-Action Alternative

Under the No-Action Alternative, there would be no project-related ground disturbance with the potential to impact vegetation. There would be no changes in the current status of vegetative species composition other than those brought about by natural environmental processes.

Cumulative Impacts

Impacts to biotic communities in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on vegetation in the area). Actions such as these can disrupt and destroy native vegetation or introduce exotic species that could out-compete native plants for limited resources. The No-Action Alternative would not contribute any project-related ground disturbance or involve other actions that could contribute to adverse cumulative impacts to vegetation in the region.

Conclusion

The No-Action Alternative would not impact vegetative communities, and would also contribute no or negligible adverse cumulative impacts to vegetation in the area. Because there would be no major, adverse impacts to vegetation, there would be no impairment of park resources or values due to the selection of the No-Action Alternative.

Impacts of Proposed Alternative

Vegetation in the project area would be disturbed or destroyed by construction equipment driving over vegetation, and trenching or plowing and filling. Approximately 27 acres of ground disturbance would occur due to the presence of construction equipment; however, less than three acres will be disturbed due to trenching or plowing and filling. Further, the disturbance would occur within the SR85 transportation corridor of which some areas are previously disturbed. If the Proposed Alternative is selected for construction, the project proponent would minimize the loss of Sonoran Desertscrub vegetation. This would be accomplished within OPCNM boundaries by using rubber-tracked construction equipment and marking native vegetation within the construction footprint, prior to the start of ground disturbing activities. Vegetation will be marked as: remove from site (RFS), transplant on site (TOS), or trim in accordance with the Plant Salvage Plan. The final disposition of trees within areas that would be trenched or plowed and columnar and barrel cacti within areas that would be trenched, plowed or bored was estimated and will be finalized in a restoration plan, separate from the Environmental Assessment. Impacts to vegetation would be adverse, localized, long-term, and moderate.

Cumulative Impacts

Impacts to biotic communities in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on vegetation in the area). Actions such as these can disrupt and destroy native vegetation or introduce exotic species that could out-compete native plants for limited resources. The moderate adverse impacts of the Proposed Alternative, in conjunction with the adverse impacts of other reasonably foreseeable future actions, would result in adverse, localized, long-term, moderate cumulative impacts to vegetation.

Conclusion

Vegetation would receive adverse, localized, long-term, moderate impacts from implementation of the Proposed Alternative. Adverse, localized, long-term, moderate, cumulative impacts to vegetation in the region would also be expected. Because there would be no major, adverse impacts to vegetation, there would be no impairment of park resources or values due to the selection of the Proposed Alternative.

Wildlife**Mammals**

The fauna at OPCNM is as diverse as the flora. The 54 mammalian species known to occur within OPCNM include 19 rodents, 13 carnivores, 13 bats, five ungulates, three rabbits and hares, and one insectivore (Cockrum and Petryszyn 1986, Lowe and Rosen 1990). It is suspected that nine additional species, several of which are bats, may also occur at OPCNM. The desert bighorn sheep (*Ovis canadensis mexicana*), mountain lion (*Felix concolor*), mule

deer (*Odocoileus hemionus*), white-tailed deer (*O. virginianus couesi*), javelina (*Tayassu tajacu*) and coyote (*Canis latrans*) are among the larger mammalian species found throughout OPCNM.

Birds

The 277 reported species of birds found at OPCNM include 63 known breeders, with an additional five that are suspected breeders; 36 of which are permanent residents and 27 summer residents (Groschupf et al. 1988). The remaining species are either winter residents; spring and/or fall migrants (71 species); or irregular or erratic, accidental or casual visitors (143 species). Birds frequently seen throughout OPCNM and the project area include Northern cardinal (*Cardinalis cardinalis*), cactus wren (*Campylorhynchus brunneicapillus*), curve-billed thrasher (*Toxostoma curvirostre*), black-tailed gnatcatcher (*Poliophtila melanura*), Gila woodpecker (*Melanerpes uropygialis*), canyon towhee (*Pipilo fuscus*), black-throated sparrow (*Amphispiza bilineata*), Gambel's quail (*Callipepla gambelii*), and phainopepla (*Phainopepla nitens*).

Amphibians and Reptiles

The monument's diverse herpetofauna includes 25 snake, 16 lizard, and four toad species. It is suspected that five additional species, including two lizard species, one snake species and two turtle species, may also occur at OPCNM (NPS 1991). High population densities of lizards and snakes at OPCNM indicate that they are important in the dynamics of the desert ecosystems, as predators, competitors, and prey (Lowe and Rosen 1996). Highway mortality of reptiles along SR85 is severe in the monument: it is estimated that approximately 500 snakes are killed per year, and a minimum of 39,000 snakes have been killed by vehicles on SR85 since establishment of OPCNM in 1937 (Lowe and Rosen 1996). The mortality as a result of increasing automobile traffic appears to have important negative effects on at least two snake species, the Mexican rosy boa (*Lichanura trivirgata*) and the Organ Pipe shovel-nosed snake (*Chionactis palarostris organica*) (Lowe and Rosen 1996). These species are NPS Sensitive Species (i.e., species that NPS has identified as sensitive within the NPS boundaries).

Impact Intensity

For this analysis, impact intensities of impacts on wildlife were derived from available information in recent Environmental Assessments prepared and approved for other federal actions within OPCNM (NPS 2003a and NPS 2003b):

Negligible: An action that could result in a change to a population or individuals of a species or a resource, but the change would be so small that it would not be of any measurable or perceptible consequence.

Minor: An action that could result in a change to a population or individuals of a species or a resource. The change would be small and localized and would be of little consequence.

Moderate: An action that would result in some change to a population or individuals of a species or resource. The change would be measurable and of consequence to the species or resource but more localized.

Major: An action that would have a noticeable change to a population of a species or resource. The change would be measurable and would result in a severely adverse or major beneficial impact, and possible permanent consequence, on the species or resource.

Impairment: A major, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's *General Management Plan* or other relevant NPS planning documents.

Impacts of No-Action Alternative

Under the No-Action Alternative, there would be no construction and therefore no project-related aural, visual or ground disturbance with the potential to impact wildlife. There would be no changes in the current status of wildlife communities either in terms of species composition or population dynamics other than those brought about by natural environmental processes.

Cumulative Impacts

Impacts to biotic communities in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on wildlife in the area). Actions such as these can disrupt or fragment habitat, displace individuals or otherwise cause stress to animals. Incremental development of the region has affected the abundance and diversity of wildlife by changing the capacity of habitats to provide necessary food, shelter and reproduction sites. Wildlife is slowly becoming more restricted by current land uses, increasing development, and human activity, causing some individuals and populations to either adapt or move. The No-Action Alternative would not contribute any project-related actions that could contribute to adverse cumulative impacts to wildlife in the region.

Conclusion

The No-Action Alternative would not impact wildlife species, and would also contribute no or negligible adverse cumulative impacts to wildlife in the immediate. Because there would be no major, adverse impacts to wildlife, there would be no impairment of park resources or values due to the selection of the No-Action Alternative.

Impacts of Proposed Alternative

Animals inhabiting the project area, including small invertebrates, mammals and reptiles that live under rocks or in ground burrows, would be displaced by construction activity. Although wildlife in the project area may be somewhat used to humans and traffic, the increased noise and disturbance of construction would likely affect animals in the short term. Construction is expected to last four months, and the equipment is likely to move ½-mile per day. Some smaller animals may return to the 27 acres within the construction footprint following construction, while others may permanently leave the project limits. Construction of this alternative would occur on previously disturbed land, where possible, or adjacent to previously disturbed land that provides minimal wildlife habitat when compared to undisturbed land: the project area is a transportation corridor, and SR85 and the area immediately adjacent to the edge-of-asphalt is subject to routine, periodic highway operation and maintenance activities that have reduced the natural quality of the roadside environment. This minimizes both the disturbance of wildlife and further impacts on habitat connections throughout the monument. As a result, impacts to wildlife would be adverse, localized, short- and/or long-term, and moderate.

Cumulative Impacts

Impacts to biotic communities in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on wildlife in the area). Actions such as these can disrupt or fragment habitat, displace individuals or otherwise cause stress to animals. Incremental development of the region has affected the abundance and diversity of wildlife by changing the capacity of habitats to provide necessary food, shelter and reproduction sites. Wildlife is slowly becoming more restricted by current land uses, increasing development, and human activity, causing some individuals and populations to either adapt or move. The Proposed Alternative involves burying approximately 22 miles of fiber-optics at least 12 feet off the west side of SR85. These impacts, in conjunction with the adverse impacts of other reasonably foreseeable future actions, would result in adverse, localized, short- and/or long-term, moderate, cumulative impacts to wildlife.

Conclusion

Implementing the Proposed Alternative would result in adverse, localized, short- and/or long-term, moderate impacts to wildlife. Moderate, adverse, cumulative impacts to wildlife in the local area would also be expected. Because there would be no major, adverse impacts to wildlife, there would be no impairment of park resources or values due to the selection of the Proposed Alternative.

Threatened, Endangered, Candidate and OPCNM Species of Concern

Management of threatened or endangered species must be consistent with all applicable laws, regulations, and policies, including the Endangered Species Act (1973), the NPS Organic Act (1916), and NPS Management Policies (NPS 2001). According to NPS Management Policies, park managers are required (1) to identify and promote the conservation of all federally-listed endangered, threatened, and candidate species and their critical habitats within park boundaries; and (2) to identify all species inhabiting or native to a national park system unit that are either state or locally listed as endangered, threatened, candidate, sensitive, rare, or declining, along with their critical habitats. These species and their critical habitats must not be adversely affected by park operations or activities external to park boundaries.

The following species that are protected under the Endangered Species Act (ESA) have been documented as occurring within the project vicinity: two endangered species, lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*) and Sonoran pronghorn (*Antilocapra americana sonoriensis*), and; one species that is a candidate for listing, Acuña cactus (*Echinomastus erectocentrus var. acunensis*). Additionally, although the cactus ferruginous pygmy-owl (pygmy-owl) (*Glaucidium brasilianum cactorum*) has been removed from the ESA list, there is some chance it will be relisted, so discussion of this species is included².

² Court proceedings have challenged the listing of the pygmy-owl, and on 3 August 2005, the USFWS formally proposed to reverse its 1997 decision to list the pygmy-owl as endangered. On 7 April 2006, the USFWS published a final rule to delist the pygmy-owl effective 15 May 2006. On 25 April 2006, a coalition of environmental groups served the USFWS a Notice of Intent to file a lawsuit challenging the delisting. This coalition requested, and was granted, a 2 June 2006 hearing in U.S. District Court (Phoenix) to argue for an injunction to block the delisting for an extended period. The presiding judge did not make an immediate ruling, and the outcome of this hearing may be unknown for some time.

The following species list (Table 4) is summarized from the USFWS list of threatened, endangered, proposed and candidate species occurring in Pima County (July 2007) (www.fws.gov/southwest/es/arizona). The USFWS list was reviewed by a qualified biologist to determine which species have the potential to occur in the project area. The following species may occur within the project limits based on habitat requirements and species range information.

Table 4. Species listed by the USFWS (July 2007) for Pima County with the potential to occur in the project limits.

Common Name	Scientific Name	Status
Acuña cactus	<i>Echinomastus erectocentrus var. acunensis</i>	C
Cactus ferruginous pygmy-owl	<i>Glaucidium brasilianum cactorum</i>	WSC
Lesser long-nosed bat	<i>Leptonycteris curasoae yerbabuenae</i>	E
Sonoran pronghorn	<i>Antilocapra americana sonoriensis</i>	E

E – Endangered as identified by USFWS

C – Candidate as identified by USFWS

WSC – Wildlife of Special Concern in Arizona

Acuña cactus

This candidate, small, ovoid-shaped cactus can be found at elevations of between 1,300-3,610 feet (397-1100 meters) on well drained knolls, ridges between washes, and small hills on granitic soils in the Sonoran Desertscrub Association of the Arizona Upland Subdivision (AGFD 2004). The majority of the project limits occurs on alluvial surfaces and in valleys; therefore, the soil types necessary for this species do not occur within the majority of the project limits. There is one location where the project limits include a knoll/gravel ridge; however, biologists from OPCNM have surveyed this area, and no individuals of this species were present (personal communication, Tim Tibbitts, OPCNM Biologist, 7 April 2006).

Cactus ferruginous pygmy-owl

The cactus ferruginous pygmy-owl (pygmy-owl) is an uncommon, permanent resident of OPCNM. The pygmy-owl is a small reddish-brown bird, with a cream-colored belly streaked with reddish-brown, a relatively long tail, and paired black-and-white ‘eye’ spots on the back of their head and neck (USFWS 2000). Recent survey efforts in Arizona document the presence of pygmy-owls in association with desertscrub and xeroriparian vegetation in OPCNM; therefore, both the uplands and the ephemeral washes within the project area may provide habitat elements necessary for pygmy-owl foraging, nesting, rearing of young, roosting, and sheltering. Pygmy-owls nest in a cavity in a tree or large columnar cactus, and breeding season may begin as early as January, and they generally nest from April to June (USFWS 2000). The pygmy-owl diet consists largely of reptiles and small birds, but also contains small mammals and invertebrates (Cartron et al. 2000), of which there are sufficient quantities within the project area. Past surveys have indicated that approximately milepost (MP) 58 to MP 61 and approximately MP 74 to MP 76 along SR85 provide suitable pygmy-owl habitat, with multiple occurrences and nests within the project area documented over the years (personal communication, Tim Tibbitts, OPCNM Biologist, 2006).

Lesser long-nosed bat

This endangered, migratory bat is present in OPCNM from mid-April through September. The project vicinity is within foraging distance of known lesser long-nosed bat roost sites in OPCNM and Cabeza Prieta National Wildlife Refuge, and these roosts are two of only three known

maternity roosts for this species in the U.S. (Appendix A). Additional day roosts are suspected in rock crevices in the Puerto Blanco, Bates, and Ajo Mountains, and numerous temporary night roosts are known to exist in various locations throughout OPCNM (NPS 2003b). This species forages at night throughout OPCNM, and its primary food source is nectar, pollen, and fruit of agaves and columnar cacti (Arizona-Sonora Desert Museum 2000, Pima County 2000, AGFD 2003a, www.fws.gov/southwest/es/arizona). Vegetation within the project limits could only provide food through August (from saguaro and organ pipe cacti) as there are no agaves within the project limits.

Sonoran pronghorn

The endangered Sonoran pronghorn is a permanent resident in OPCNM, but probably occurs in greater numbers during the late winter and spring dry season (NPS 2003b). The majority of the project area consists of a paloverde-mixed scrub desert community with mixed cacti associations which could provide cover and forage elements for this species but is not used often by this species. The project limits cross an area, however, within the creosote bush/bursage desert community (between highway MPs 67 and 71) that has been identified as a potential pronghorn crossing area. Also, ephemeral washes bisect the project area that may be beneficial for movement across the SR85 roadway. The project vicinity contains suitable concentrations and sufficient amounts of food plants that are important for Sonoran pronghorn herds and biotic assemblages consistent with suitable pronghorn habitat.

OPCNM Species of Concern

The NPS maintains a list of wildlife and plant species that are identified as “sensitive” within NPS boundaries. This list typically includes federally-listed species and other non-federally-listed species of particular concern to NPS biologists. OPCNM was contacted regarding sensitive species and, in addition to the aforementioned federally-listed species, the following sensitive species were identified:

Bobcat

The bobcat (*Felis rufus*) is a common mammal species within OPCNM; many reports of scats and tracks are available (Petryszyn and Cockrum 1990). The bobcat is both common and widely distributed in the Sonoran Desert. The bobcat is mostly nocturnal and secretive, and is, therefore, not often seen by people (Arizona-Sonora Desert Museum 2000). Bobcats are most common in rugged, heavily vegetated areas, but can be found in a variety of habitats (MacMahon 1985, Arizona-Sonora Desert Museum 2000): areas that support good prey populations would likely also support bobcats. Bobcats typically prey on jack rabbits, cottontails, birds, snakes and rodents. The bobcat’s home range is only a few square miles, depending on prey availability, but if prey is scarce they may wander extensively.

Kit Fox

The kit fox (*Vulpes macrotis*) inhabits dry, open, sparsely vegetated flats and areas with deep soils for digging dens; this fox is a great digger, and any area occupied by kit foxes will be pocked with dozens of den holes (MacMahon 1985, Arizona-Sonora Desert Museum 2000). The kit fox is carnivorous and depends on kangaroo rats for most of its diet but may also eat mice, rabbits, birds, even scorpions and occasional plants. It is nocturnal so it is not often seen by people; however, as with other canids, the kit fox is a scavenger and, therefore, may be seen running along the roads in the morning looking for roadkill. Kit foxes can survive without free water by gaining it from the blood and moisture in their prey. Kit fox numbers are declining due to loss of habitat and poisoning.

Gila monster

The bulk of the Gila monster's (*Heloderma suspectum*) range is in western and southern Arizona, continuing into southern Sonora, Mexico (Arizona-Sonora Desert Museum 2000). This venomous lizard is most commonly found in mountain foothills dominated by saguaros and paloverde trees and washes that extend down into valleys. They construct burrows in gravelly and sandy soils, or may burrow under rocks or in holes dug by other animals. Gila monsters are primarily diurnal from March through November. They prey on: newborn rabbits; ground nesting birds and lizards, and; bird, lizard, snake and tortoise eggs (MacMahon 1985, Arizona-Sonora Desert Museum 2000).

Small-time poaching by reptile enthusiasts is an ongoing problem that is difficult to control and of relatively minor consequence (Lowe and Rosen 1996). The Gila monster is one of the most sought-after primarily rock-dwelling reptile species, and because this species occurs at low population densities, the removal of a single or a few individuals may represent a substantial (though not irreversible) impact.

Mexican rosy boa

The Mexican rosy boa (*Lichanura trivirgata trivirgata*) is a gentle, slow-moving, secretive snake that eats birds, lizards and rodents (MacMahon 1985). The Mexican rosy boa inhabits rock piles or rodent burrows, and it may be active at any time of the day or night. The range of this species occurs from southern Arizona to Sonora, Mexico and into the southern half of Baja, California. This species is generally associated with xeroriparian desertscrub habitat; therefore, the drainages that cross SR85 within the project limits provide suitable habitat for this species.

Small-time poaching by reptile enthusiasts is an ongoing problem that is difficult to control and of relatively minor consequence (Lowe and Rosen 1996). The Mexican rosy boa is one of the most sought-after primarily rock-dwelling reptile species, and because this species occurs at low population densities, the removal of a single or a few individuals may represent a substantial (though not irreversible) impact. This species appears to be virtually extirpated within its cruising range of SR85. In earlier decades this species was regularly, though infrequently, observed on near SR85, with confirmed records, and in the OPCNM records and preserved collection. Several live boas were located within OPCNM (from 1987-1991), all at distances from SR85; the last-observed boa on SR85 was 1 September 1983. This slow-crawling snake is most active on the surface during cool and mild seasons which is also the same time that vehicular traffic is heaviest at OPCNM; the extirpation of this species near SR85 is likely due to the presence of steadily burgeoning automobile traffic.

Organ Pipe shovel-nosed snake

The Organ Pipe shovel-nosed snake (*Chionactis palarostris organica*) occurs from extreme south central Arizona south to the Gulf of California, as far south as Hermosillo, Mexico, but is known to occur in the U.S. only in OPCNM; the total population is unknown (Lowe and Rosen 1996, AGFD 2003b). In Arizona, this species occupies paloverde-saguaro habitats with sandy and sandy-gravelly soils, bajadas and hilly terrain, and at elevation ranges from 1,410 – 2,280 feet (430-695 m). This mildly venomous snake is relatively long-lived. This snake is a strong nocturnal burrower; daylight hours are spent beneath the surface in rodent or lizard holes, or beneath rocks. They are observed on the surface in mid-spring and early summer, at the moment of darkness, and they are occasionally diurnal. This snake is a specialized eater and feeds upon arthropods including crickets, cockroaches, spiders, centipedes and scorpions.

This snake species, found frequently on SR85, is a prized species for poachers (Lowe and Rosen 1996). The Organ Pipe shovel-nosed snake, suffers very high road mortality in its

natural range within the U.S. along SR85. There is a single record of this species that was trapped within 2 miles (3.2 km) of SR85; all other observations of it, and all other confirmed records, are from the surface of SR85. This snake is often confused with local banded sand snakes (*Chilomeniscus cinctus*); however, there are several reports of it in the monument headquarters area that may be valid.

Sonoran Desert tortoise

The unlisted Sonoran Desert tortoise (*Gopherus agassizii*) population occurs south and east of the Colorado River (AGFD 2001). The Sonoran population of the desert tortoise occurs primarily on rocky slopes and bajadas of Sonoran desertscrub; shelter sites are rarely found in shallow soils. The Sonoran population occurs at elevations ranging from about 510-5300 feet (155-1615 m) and is found most often in paloverde-mixed cacti associations. Sonoran desert tortoise forage includes a variety of annual forbs, grasses, herbaceous perennials, trees and shrubs, subshrubs/woody vines, and succulents. In OPCNM, the tortoise occurs on all of the major rockpiles at the monument and also occupies upper bajada and arroyo habitats and extends downward into some middle bajadas along rockier washes (Lowe and Rosen 1996). One of the most important habitat features of tortoises in the Sonoran Desert is adequate shelter (AGFD 2001). Tortoises excavate shallow burrows in loose soil below rocks and boulders to escape extreme temperatures. Tortoises are active outside their burrows in the spring as temperatures warm, become less active during summer drought in May and June, more active as summer monsoon season begins (August-September), and then activity decreases sharply after mid-October, as tortoises begin to spend more time in their burrows. Mating occurs during the summer monsoon season, and females begin laying eggs inside burrows with adequate soil development just before or during the onset of the summer rains, in late June or early July.

OPCNM supports healthy, though not remarkably large or dense, populations of the desert tortoise, and this species is widely distributed throughout the monument (Lowe and Rosen 1996). Although the tortoise at OPCNM is not endangered by natural events, it is especially vulnerable to being collected, picked up, or otherwise mistreated by people. Small-time poaching by reptile enthusiasts is an ongoing problem that is difficult to control and of relatively minor consequence. The Sonoran Desert tortoise is one of the most sought-after primarily rock-dwelling reptile species, and because this species occurs at low population densities, the removal of a single or a few individuals may represent a substantial (though not irreversible) impact.

Ironwood

Ironwood is a characteristic tree species of the *Ambrosia deltoidea-Cercidium microphyllum-Olneya tesota* association (Warren et al. 1981). This association can be found on gentle, rolling slopes of the middle bajada in the Sonoita Valley, from 1,400 to 1,600 feet. This association is found on sandy loam soil, with slightly greater drainage density than surrounding types. This association usually is bounded at lower elevations by creosotebush or saltbush associations and at higher elevations by other bursage-paloverde associations.

Organ Pipe cactus

This subtropical desert species reaches the northern limit of its distribution in OPCNM (Warren et al. 1981). The Organ Pipe cactus is a characteristic species of the *Cercidium microphyllum-Ambrosia deltoidea-Lemaireocereus (Stenocereus) thurberi* with *Jatropha spp.* association. This association can be found on level to rolling terrain from 1,600 to 2,000 feet on the south side of the Puerto Blanco Mountains and in the Senita Basin. The association is found on gravelly soils, derived from decomposed granite and schist, which is usually fairly deep (greater

than 1 meter) but may be underlain by bedrock. This type includes many of the most frost-sensitive species in the monument. Organ pipe cacti are frost-sensitive, and therefore occur on warm, south-facing rocky hillsides mixed into paloverde-mixed cacti associations. To the southeast of Diaz Peak, what appears to be the highest density of organ pipe cactus in the monument occurs in a unit of this association. Organ pipe cacti are self-sterile and require cross pollination to reproduce; organ pipe cacti are pollinated by bees and bats. The most successful germination sites are generally among rocks on hillsides and/or under the protective canopy of woody shrubs or trees.

Saguaro cactus

The Saguaro cactus is a characteristic and associated species of several associations within OPCNM (Warren et al. 1981). Saguaro cacti are self-sterile and require cross pollination to reproduce; they are pollinated by bees, white-winged doves, and leaf-nosed bats. The flowers of saguaros open in May or June; the fruits ripen and seeds are dispersed in late June or early July just before the summer rains. The most successful germination sites are generally among rocks on hillsides and/or under the protective canopy of woody shrubs or trees. In addition to natural depletion, saguaro populations are damaged by man as a result of woodcutting and grazing, which destroy microhabitats necessary for seedling establishment, and by direct destruction and removal of adults.

Desert Queen of the Night

The desert queen of the night (*Peniocereus greggii* var. *transmontanus*) usually resembles dead sticks, but for one spring or summer night only, each year, this cactus blossoms. This rare cactus species is found on sandy or gravelly loams, in creosote bush-bursage flats, and on the edges of washes and on slopes of small hills. It occurs at elevations between 1000 and 3600 feet (300-1100 meters) in the Sonoran Desert in Arizona and Sonora, Mexico (www.efloras.org).

Impact Intensity

For this analysis, impact intensities of impacts on threatened, endangered, candidate and OPCNM species of concern were derived from available information in recent Environmental Assessments prepared and approved for other federal actions within OPCNM (NPS 2003a and NPS 2003b). The thresholds of change for the intensity of an impact are defined as follows:

Negligible: An action could result in a change to a population or individuals of a species or a resource, but the change would be so small that it would not be of any measurable or perceptible consequence.

Minor: An action could result in a change to a population or individuals of a species or a resource. The change would be small and localized and of little consequence.

Moderate: An action would result in some change to a population or individuals of a species or resource. The change would be measurable and of consequence to the species or resource but more localized.

Major: An action would have a noticeable change to a population or a large number of individuals of a species or resource. The change would be measurable and would result in a severely adverse or major beneficial impact, and possible permanent consequence, upon the species or resource.

Impairment: A major, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or

proclamation of the park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's *General Management Plan* or other relevant NPS planning documents.

Impacts of No-Action Alternative

Under the No-Action Alternative, there would be no construction and therefore no project-related aural, visual or ground disturbance with the potential to impact threatened, endangered, candidate or OPCNM species of concern. There would be no changes in the current status of these communities either in terms of species composition or population dynamics other than those brought about by natural environmental processes.

Cumulative Impacts

Impacts to biotic communities in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on threatened, endangered and OPCNM species of concern in the area). Actions such as these can disrupt or fragment habitat, displace individuals or otherwise cause stress to animals. Incremental development of the region has affected the abundance and diversity of wildlife by changing the capacity of habitats to provide necessary food, shelter and reproduction sites. Wildlife is slowly becoming more restricted by current land uses, increasing development, and human activity, causing some individuals and populations to either adapt or move. The No-Action Alternative would not contribute any project-related actions that could contribute to adverse cumulative impacts to threatened, endangered, candidate or OPCNM species of concern in the region.

Conclusion

The No-Action Alternative would not impact threatened, endangered, candidate or OPCNM species of concern, and would also contribute no or negligible adverse cumulative impacts to threatened, endangered or OPCNM species of concern in the immediate area. Because there would be no major, adverse impacts to threatened, endangered or OPCNM species of concern, there would be no impairment of park resources or values due to the selection of the No-Action Alternative.

Impacts of Proposed Alternative

Although wildlife in the project area may be somewhat used to humans and traffic in the area, the increased noise and disturbance of construction would likely affect animals. Construction is expected to last four months, and equipment is projected to construct ½-mile per day. Some smaller animals may return to the 27 acres within the construction footprint following construction, while others may permanently leave the project limits. Construction of this alternative would occur on previously disturbed land, where possible, or adjacent to previously disturbed land that provides minimal wildlife habitat when compared to undisturbed land: the project area is a transportation corridor, and SR85 and the area immediately adjacent to the edge-of-asphalt is subject to routine, periodic highway operation and maintenance activities that have reduced the natural quality of the roadside environment. This minimizes both the disturbance of wildlife and further impacts on habitat connections throughout the monument. As a result, impacts to threatened, endangered, candidate or OPCNM species of concern would be adverse, localized to regional, short- and/or long-term, and negligible to moderate.

Acuña cactus

No Acuña cactus habitat is present within the project limits with the exception of one location, where the project limits include a knoll/gravel ridge: biologists from OPCNM have surveyed this area, and no individuals of this species were present (personal communication, Tim Tibbitts, OPCNM Biologist, 7 April 2006); therefore, the Proposed Alternative would not affect the Acuña cactus or its habitat.

Cactus ferruginous pygmy-owl

Calling surveys for cactus ferruginous pygmy-owls (pygmy-owls) were conducted in spring 2006, and no pygmy-owls were detected. Several other project-compliance surveys have been conducted adjacent to SR85, and these past surveys have indicated that areas near approximately milepost (MP) 58 to MP 61 and approximately MP 74 to MP 76 along SR85 provide suitable pygmy-owl habitat, with multiple occurrences and nests within the project area documented over the years. The Proposed Alternative could potentially result in two types of impacts to the pygmy-owl: the first type of impact is related to the removal of vegetation that may provide components of habitat suitable for nesting and connectivity, and the second type of impact is related to potential noise disturbance resulting from construction activities. Many viable saguaro cacti and large diameter trees were located within the project limits both within the uplands and in the riparian areas. Construction activities would not necessitate the removal of large saguaro or organ pipe cacti (≥ 3.5 feet in height) or large trees (≥ 4 inches diameter at one foot above soil surface), and no vegetation would be removed within riparian areas surrounding washes; therefore, the habitat elements necessary for pygmy-owl foraging, nesting, rearing of young, roosting, and sheltering would be preserved. Construction work would disturb a negligible amount of suitable habitat within OPCNM (approximately 23 acres of habitat disturbance in known pygmy-owl territory would occur out of the monument's overall 330,689 acres), approximately four acres on BLM lands, less than one acre on Arizona State Trust lands, and less than one acre on private lands.

Any noise disturbance due to construction activities would be localized and temporary and would cease once the construction was complete. If construction activities are not complete prior to 1 February 2008, and the pygmy-owl is relisted, surveys would be conducted of all potential pygmy-owl nesting habitat within 400 meters of the project prior to continuing construction. Based on the aforementioned proposed conservation measures, the relatively short-term nature of this project, and the reduced disturbance limits, the Proposed Alternative is expected to cause adverse, localized, short-term, negligible impacts on the pygmy-owl.

Lesser long-nosed bat

Implementation of the Proposed Alternative would not affect roost sites typically used by these bats because the closest large maternity site is several miles away from the project limits. This bat species forages in large flocks at night in wide areas on blooming flowers of extensive stands of succulent plant species such as saguaro and organ pipe. The project vicinity contains suitable concentrations and sufficient amounts of food plants that are crucial for large flocks of lesser long-nosed bats; however, construction activities would not necessitate the removal of large saguaro and organ pipe cacti (≥ 3.5 feet in height). Although construction may occur during the saguaro fruiting season (most fruits are gone by the end of August), no food plants would be removed from the construction area. Further, any noise disturbance due to construction activities would occur during the day when bats would not be present and would be localized and temporary and would cease once the installation was complete. Based on the relatively short-term nature of this project, and the reduced disturbance limits, the construction of the Proposed Alternative is expected to cause adverse, localized, short-term, negligible impacts on the lesser long-nosed bat.

Sonoran pronghorn

The Proposed Alternative could potentially result in two types of impacts to the Sonoran pronghorn: the first type of impact is related to the removal of vegetation that may provide cover and suitable food sources, and the second type of impact is related to potential noise disturbance resulting from construction activities. The project vicinity contains suitable concentrations and sufficient amounts of food plants that are important for Sonoran pronghorn herds such that the removal of any forbs, shrubs or cacti through construction activities would not appreciably reduce the quality of suitable foraging habitat in the project vicinity. Although the proposed alternative would not appreciably reduce the quality of suitable foraging habitat in the project vicinity, the damage to a 10-foot wide strip of vegetation as a result of the construction of the Proposed Alternative may further contribute to the existing SR85 barrier to east/west pronghorn movements; however, the proximity of the project limits to the SR85 roadway and associated levels of traffic volume and sound makes it unlikely that this species would forage within the project limits for any extended period of time.

To avoid impacts to this species during the fawning and summer hot seasons when pronghorn typically utilize the vicinity of this project (Appendix A), construction activities would occur between 1 August 2007 and 15 March 2008 within pronghorn habitat (i.e., within OPCNM). The noise and movement associated with construction would cause fear and avoidance reactions during that time; however, the disturbance would be localized and temporary and would cease once the installation was complete. It is possible, however, that pronghorn may be encountered in the project area during construction; therefore, it has been determined that the potential impact to this species would be adverse, localized to regional, short-term, and minor.

OPCNM Species of Concern

Construction of this alternative would occur on previously disturbed land, where possible, or adjacent to previously disturbed land that provides minimal wildlife habitat when compared to undisturbed land: the project area is a transportation corridor, and SR85 and the area immediately adjacent to the edge-of-asphalt is subject to routine, periodic highway operation and maintenance activities that have reduced the natural quality of the roadside environment. Mammal (i.e., kit fox) and reptile (i.e., Gila monster, Mexican rosy boa, Organ Pipe shovel-nosed snake, Sonoran Desert tortoise) OPCNM species of concern inhabiting the project area that live under rocks or in ground burrows would be displaced by construction activity. If any tortoises are found during construction, they would be handled in accordance with "Arizona Game and Fish Department Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects" (Appendix D). OPCNM plant species of concern (i.e., ironwood, Organ Pipe cactus, Saguaro cactus, and desert queen of the night) would either be avoided by construction activity or temporarily displaced (i.e., transplanted on-site). Although all OPCNM wildlife species of concern in the project area, including bobcats, may be somewhat used to humans and traffic in the area, the increased noise and disturbance of construction would likely affect animals. Construction is expected to last four months, moving at a rate of ½-mile per day. Following construction some animals may return to the approximately 22 acres of the construction footprint (within OPCNM), while others may permanently leave the project limits. As a result, impacts to OPCNM Species of Concern would be adverse, localized, short- and/or long-term, and negligible to moderate.

Cumulative Impacts

Impacts to biotic communities in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines;

fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on threatened, endangered or OPCNM species of concern in the area). Actions such as these can disrupt or fragment habitat, displace individuals or otherwise cause stress to animals. Incremental development of the region has affected the abundance and diversity of wildlife by changing the capacity of habitats to provide necessary food, shelter and reproduction sites. Wildlife is slowly becoming more restricted by current land uses, increasing development, and human activity, causing some individuals and populations to either adapt or move. The Proposed Alternative involves burying approximately 22 miles of fiber-optics at least 12 feet off the west side of SR85, and the impacts to a 10-foot wide strip of vegetation as a result of the construction of the Proposed Alternative may further contribute to the existing SR85 barrier to east/west wildlife (e.g., pronghorn) movements. These impacts, in conjunction with the adverse impacts of other reasonably foreseeable future actions, would result in adverse, localized to regional, short- and/or long-term, negligible to moderate impacts to threatened, endangered, candidate or OPCNM species of concern.

Conclusion

Based on the aforementioned proposed conservation measures, the relatively short-term nature of this project, and the reduced disturbance limits, the Proposed Alternative would: not affect the Acuña cactus or its habitat; cause adverse, localized, short-term, negligible impacts on the lesser long-nosed bat and pygmy-owl; cause adverse, localized to regional, short-term, minor impacts on the Sonoran pronghorn, and; result in adverse, localized short- and/or long-term, negligible to moderate impacts to OPCNM Species of Concern. Because there would be no major, adverse impacts to threatened, endangered or OPCNM Species of Concern, there would be no impairment of park resources or values due to the selection of the Proposed Alternative.

Visitor Use, Understanding, and Appreciation

The main route of access to OPCNM is by way of SR85, which transverses the monument from north to south. OPCNM received 1,413,971 visitors in 2005, of which 280,068 were recreational³ and 1,133,903 were non-recreational⁴; however, total visitation was not expected to increase in 2006 (data is not yet available) or in 2007 (NPS 2005). Because of OPCNM's location in the hot Sonoran desert, most visitors come in the late winter and spring months (peak visitation season is typically January through March) when the temperatures are cooler.

Visitors come to OPCNM for the peace, beauty, open space and the opportunity for solitude (NPS 1998). They also visit the monument for both the primitive and drive-in camping opportunities that OPCNM and the surrounding region provides. Approximately 95% of the visitors to OPCNM use the visitor center to use the restrooms, view the interpretive exhibits, and/or talk to a park ranger. The majority of the visitors to OPCNM use the trails which provide opportunities for recreation, exercise, and for access to natural history and cultural history sites. An additional primary experience at the monument includes driving one or both of the scenic unpaved one-way loop drives: Ajo Mountain Drive (21 miles) and Puerto Blanco Drive (53 miles). To the visitors whose drive along SR85 is their only experience within OPCNM, the view from the highway is the only opportunity to view the vast and un-fragmented view of the landscape that stretches from the road edge.

³ The entry of a person onto lands or waters administered by the NPS for recreational purposes excluding government personnel, through traffic (commuters), trades-person, and a person residing within park boundaries (NPS 2005).

⁴ A reportable non-recreation visit includes through traffic, persons going to and from inholdings, trades-people with business in the park, and government personnel (other than NPS employees) with business in the park (NPS 2005).

The alignment of the Proposed Alternative is adjacent to SR85 which runs through BLM, Arizona State Trust Lands, and OPCNM. One of the most significant issues affecting visitor experience is the increasing amount of commercial and other vehicle traffic on SR85. As previously noted, the majority of the visitors to the monument are non-recreational visitors resulting in the majority of the traffic passing through OPCNM. Consequently, many of these travelers never realize they have entered OPCNM.

The number and experiences of visitors to the BLM and Arizona State Trust lands within the project limits is unknown (but see Chapter III, Adjacent Lands for a list of activity opportunities on BLM lands within the project limits). There is a campground on BLM lands west of the project limits, and the Arizona State Trust lands are primarily used for grazing.

Impact Intensity

For this analysis, the estimated effects of the alternative actions on visitors were derived from available information in recent Environmental Assessments prepared and approved for other federal actions within OPCNM (NPS 2003a and NPS 2003b). The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:* The impact would be barely detectable and/or would affect few visitors. Visitors would likely be unaware of any effects associated with implementation of the alternative. There would be no noticeable change in visitor use and experience or in any defined indicators of visitor satisfaction or behavior.
- Minor:* The impact would be slight but detectable, and/or would affect some visitors but would not appreciably limit or enhance critical characteristics of the visitor experience. Visitor satisfaction would remain stable.
- Moderate:* The impact would be readily apparent and/or would affect many visitors. Visitor satisfaction would begin to either decline or increase as a direct result of the effect.
- Major:* The impact would be severely adverse or exceptionally beneficial and/or would affect the majority of visitors. Multiple critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be altered. The visitor would be aware of the effects associated with implementation of the alternative and would likely express a strong opinion about the change. Visitor satisfaction would markedly decline or increase.

Impacts of No-Action Alternative

Under the No-Active Alternative, the fiber optic line would not be installed, and the visitors to OPCNM and the surrounding communities would continue to be subject to using the current telecommunication system which utilizes an antenna, is out of date, and for which replacement parts for the system are not available. In addition to OPCNM, this telecommunication system also services all local law enforcement in the area including the Border Patrol, U.S. Customs, the Sheriff Department, and the Department of Public Safety. The No-Action Alternative would result in adverse, regional, long-term, minor to moderate impacts to visitors.

Cumulative Impacts

Other current and foreseeable projects in the area have the potential to affect monument visitation. Impacts to visitors in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and

foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on area visitors). New trails have been opened in the monument, and the visitor experience has and would continue to be enhanced through improved interpretive media. The No-Action Alternative, in conjunction with the adverse impacts of other reasonably foreseeable future actions, would contribute adverse, regional, long-term, minor to moderate cumulative impacts to the type or level of visitation in the region.

Conclusion

Implementing the No-Action Alternative would cause the continuation of adverse, regional long-term, minor to moderate impacts to opportunities for visitors because visitors to OPCNM and the surrounding communities and local law enforcement would continue to be subjected to using the current, outdated telecommunication system. Adverse, regional, long-term, minor to moderate cumulative impacts to visitors would also be expected.

Impacts of Proposed Alternative

The purpose of the Proposed Alternative is to replace and upgrade the telecommunications system in order to provide additional, more reliable, and faster telecommunications networking services to the areas currently served by Table Top Telephone Company, Inc. (TTTC). TTTC services include high-speed connections, which are required in today's environment for educational, medical, and business purposes. The objectives of the proposed project are to: provide additional, more reliable, and faster telecommunications networking services to the project area, and; improve safety for all residents, visitors and those traveling through the area through improved communications. The Proposed Alternative would provide beneficial, regional, long-term, moderate impacts to visitor experience by providing additional, more reliable, and faster telecommunications networking services to the area and improving visitor safety.

Construction and the trench scars could affect the natural or historic viewscales at OPCNM by disrupting the aesthetic qualities of the natural surroundings by causing adverse, localized, long-term, and moderate impacts to soils and vegetation within the construction footprint; however, the Proposed Alternative would use rubber-tracked equipment to minimize disturbance and would construct the fiber optics line at least 12 feet from the edge of SR85 asphalt, with a maximum distance of disturbance at 30 feet from the edge of asphalt and would not appreciably affect topography, vegetation, spatial organization, or land use patterns associated with the landscape. In addition, any audible and atmospheric intrusions associated with construction would be temporary and negligible, lasting only as long as construction. Hence, there also would be adverse, localized, short- and long-term, minor to moderate impacts on visitor experience.

Cumulative Impacts

Other current and foreseeable projects in the area have the potential to affect monument visitation. Impacts to visitors in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on area visitors). New trails have been opened in the monument, and the visitor experience has and would continue to be enhanced through improved interpretive media. The Proposed Alternative would not attract additional

visitors to the monument and, therefore, would not contribute to the cumulative impacts of other past, present and reasonably foreseeable future actions, to the type or level of visitation in the region.

Conclusion

The Proposed Alternative would result in both adverse, localized, short- and long-term, minor to moderate impacts and beneficial, and regional, long-term, moderate impacts to visitor use and experience. Negligible adverse cumulative impacts would be expected.

Human Health and Safety

Law enforcement personnel routinely pursue illegal vehicles along SR85, and the amount of illegal activity substantially increased within OPCNM between 1998 and 2001 (NPS 2003a). Continued drug and people smuggling (and the high-speed chases that accompany such activities) produces the ongoing potential for injury or death to employees and the public. Further, the visitors and residents to the area are subjected to the current, outdated telecommunication system which has the potential to reduce response time of local law enforcement and emergency responders to situations which require the protection of human health and safety.

Impact Intensity

For this analysis, the estimated effects of the alternative actions on human health and safety were derived from available information in a recent Environmental Assessment prepared and approved for another federal action within OPCNM (NPS 2003a). The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:* Public health and safety would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on public health or safety.
- Minor:* The effect would be detectable and would likely be short-term, but would not have an appreciable effect on public health or safety. If mitigation was needed, it would be relatively simple and would likely be successful.
- Moderate:* The effects would be readily apparent and long term, and they would result in substantial, noticeable effects to public health and safety on a local to regional scale. Mitigating measures would probably be necessary and would likely be successful.
- Major:* The effects would be readily apparent and long term, and they would result in substantial, noticeable effects to public health and safety on a regional to national scale. Extensive mitigation measures would be needed, and their success would not be guaranteed.

Impacts of No-Action Alternative

Under the No-Active Alternative, the fiber optic line would not be installed, and the visitors and residents of the surrounding communities would continue to be subjected to the outdated telecommunication system which has the potential to reduce response time of local law enforcement and emergency responders to situations which require the protection of human health and safety. The No-Action Alternative would result in adverse, regional, long-term, moderate impacts to health and human safety.

Cumulative Impacts

Other current and foreseeable projects in the area have the potential to affect health and human safety within the region. Impacts to residents and visitors in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on the health and human safety of area residents and visitors). The No-Action Alternative, in conjunction with the growth in the region without adequate infrastructure, would contribute cumulative adverse, localized and regional, short- and long-term, minor to moderate impacts to human health and safety.

Conclusion

Implementing the No-Action Alternative would cause the continuation of adverse, regional, long-term, moderate impacts to the human health and safety of area residents and visitors because they would continue to be subjected to the outdated telecommunication system which has the potential to reduce response time of local law enforcement and emergency responders to situations which are required for the protection of human health and safety. Adverse, localized and regional, short- and long-term, minor to moderate cumulative impacts to the human health and safety would also be expected.

Impacts of Proposed Alternative

The purpose of the Proposed Alternative is to replace and upgrade the telecommunications system in order to provide additional, more reliable, and faster telecommunications networking services to the areas currently served by TTTC. TTTC provides services including high-speed connections, which are required in today's environment for educational, medical, and business purposes. The objectives of the proposed project are to: provide additional, more reliable, and faster telecommunications networking services to the project area, and; improve safety for all residents, visitors and those traveling through the area through improved communications. By providing additional, more reliable, and faster telecommunications networking services, the Proposed Alternative would provide beneficial, regional, long-term, moderate impacts to human health and safety.

Cumulative Impacts

Other current and foreseeable projects in the area have the potential to affect the human health and safety of area residents and visitors. Impacts to human health and safety in and around the project limits are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on the human health and safety of area residents and visitors). The Proposed Alternative, in conjunction with other past, present and reasonable foreseeable future actions, would contribute beneficial, localized and regional, long-term, moderate cumulative impacts to human health and safety.

Conclusion

The Proposed Alternative would result in beneficial, regional, long-term, moderate impacts to human health and safety. Beneficial, localized and regional, long-term, moderate cumulative impacts to human health and safety would be expected.

Park Management and Operations

OPCNM encompasses 330,000 acres in the Sonoran Desert, the most biologically desert within the U.S. (Arizona-Sonora Desert Museum 2000), and it is the site of the intersection of three cultures that is significant archaeologically, geographically, and internationally. OPCNM currently has 39 full-time employees (personal communication, Mary Kralovec, OPCNM Chief of Resources, 27 February 2007). Management and Administration support all activities as required by Director's Orders 2, 6, 9, 12, 18, 22, 28, 32, 43, 44, 53, 62, 77, and NPS Management Policies (2001). The monument's current Operational Budget is \$3,254,500.

Impact Intensity

For this analysis, the estimated effects of the alternative actions on park management and operations were derived from available information in a recent Environmental Assessment prepared and approved for another federal action within OPCNM (NPS 2003a). The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Park operations would not be affected or the effect would be at or below the lower levels of detection.

Minor: The effect would be detectable, but would be of a magnitude that it would not have an appreciable adverse or beneficial effect on park operations. If mitigation were needed to offset adverse effects, it would be relatively simple and successful.

Moderate: The effect would be readily apparent and would result in a substantial adverse or beneficial change in park operations in a manner noticeable to staff and the public. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.

Major: The effect would be readily apparent and would result in a substantial adverse or beneficial change in park operations in a manner noticeable to staff and the public and would be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, could be expensive, and their success could not be guaranteed.

Impacts of No-Action Alternative

Under the No-Active Alternative, the fiber optic line would not be installed, and park management and operations would continue to be subjected to the outdated telecommunication system which has the potential to limit research capabilities and communications, and reduce response time of local law enforcement, including park rangers. The No-Action Alternative would result in adverse, localized to regional, long-term, moderate impacts to OPCNM's management and operations.

Cumulative Impacts

Other current and foreseeable projects in the area have the potential to impact the monument's management and operations. Impacts to OPCNM's management and operations are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on the monument's management and operations). The No-Action Alternative, in conjunction with other past,

present and reasonable foreseeable future actions, would contribute cumulative adverse, localized and regional, long-term, minor to moderate impacts to OPCNM's management and operations.

Conclusion

Implementing the No-Action Alternative would cause the continuation of adverse, moderate, long-term, localized to regional impacts to OPCNM's management and operations because they would continue to be subjected to the outdated telecommunication system which has the potential to limit research capabilities and communications, and reduce response time of local law enforcement, including park rangers. Adverse, localized and regional, long-term, minor to moderate impacts to OPCNM's management and operations would also be expected.

Impacts of Proposed Alternative

The purpose of the Proposed Alternative is to replace and upgrade the telecommunications system in order to provide additional, more reliable, and faster telecommunications networking services to the areas currently served by TTTC. TTTC provides services including high-speed connections, which are required in today's environment for educational, medical, and business purposes. The objectives of the proposed project are to: provide additional, more reliable, and faster telecommunications networking services to the project area, and; improve safety for all residents, visitors and those traveling through the area through improved communications. Further, the Proposed Alternative would assist meeting the monument's goal of the General Management Plan (NPS 1998) of providing "better resources for ongoing scientific work within monument boundaries." The installation of a fiber optic line would provide beneficial, localized to regional, long-term, moderate impacts to park administration and researchers by creating a modern, high-speed information connection to and from the monument.

Cumulative Impacts

Other current and foreseeable projects in the area have the potential to affect OPCNM's management and operations. Impacts to the monument's management and operations are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on OPCNM's management and operations). The Proposed Alternative, in conjunction with other past, present and reasonable foreseeable future actions, would contribute cumulative beneficial, localized, long-term, minor impacts to the monument's management and operations.

Conclusion

The Proposed Alternative would result in beneficial, localized to regional, long-term, moderate benefits to the monument's management and operations. Further, the Proposed Alternative would assist meeting the monument's goal of the General Management Plan (NPS 1998) of providing "better resources for ongoing scientific work within monument boundaries." Beneficial, localized, long-term, minor cumulative impacts to the monument's management and operations would be expected.

Socioeconomics

Socioeconomic values consist of local and regional businesses and residents, the local and regional economy, and monument concessions (NPS 2003b). The local economy and most business of the communities surrounding the monument are based on construction, tourist sales

and services, and educational research. The regional economy is strongly influenced by tourist activity. The approved 1998 GMP discussed the socioeconomic environment and impacts extensively.

Southwest Arizona is a region of small rural communities, public lands, and large ranches. OPCNM is located in Pima County, and the county seat and largest town is Tucson, with 924,786 people in 2005 (www.census.gov) and is located approximately 100 miles east of the northern end of the project limits. The entire project is located in census tract which had a population of 0.134 people per square mile in 2000 (www.dot.co.pima.az.us/gis/maps/mapguide). Other recreation and tourism attractions in the region include: the Cabeza Prieta Wildlife Refuge and the Ajo Historical Museum in Ajo, and; SR85 itself provides the gateway to the U.S. Customs port-of-entry at the international border at Lukeville which is the most traveled route to the Mexico vacation hot-spot of Rocky Point. Why, a small unincorporated town with a gas station and a bar/restaurant, is located at the northern limits of the project site. Lukeville, is just five miles south of the southern end of the project limits, and is comprised of approximately 65 acres of privately-owned land just north of the port-of-entry. Lukeville has a shopping plaza, a service station, an RV park and campground, and a hotel. The economy in the general region includes tourism, camping, recreation, mining, ranching, and hunting.

Impact Intensity

For this analysis, the estimated effects of the alternative actions on socioeconomics were derived from available information in a recent Environmental Assessment prepared and approved for a federal action within another national monument (NPS 2004). The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:* There would be no measurable effect on local economic conditions, businesses or employment.
- Minor:* Slight changes in employment or business status would temporarily affect local socio-economic conditions.
- Moderate:* Measurable change or beneficial effect on the employment and/or business conditions that while temporary may impact more than the local area.
- Major:* A substantial change, disruption or beneficial effect on socio-economic conditions that are permanent or impacts regional socio-economic conditions.

Impacts of No-Action Alternative

Under the No-Active Alternative, the fiber optic line would not be installed, and there would be no measurable effect on local economic conditions, businesses or employment. The No-Action Alternative would result in no to negligible impacts to the local socioeconomic conditions.

Cumulative Impacts

Other current and foreseeable projects in the area have the potential to impact local socioeconomic conditions. Impacts to local socioeconomic conditions are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on local socioeconomic conditions). The No-Action Alternative, in conjunction with other past, present and reasonable

foreseeable future actions, would result in negligible cumulative effects to local socioeconomic conditions.

Conclusion

Under the No-Active Alternative, the fiber optic line would not be installed, and there would be no measurable effect on local economic conditions, businesses or employment. The No-Action Alternative would result in no to negligible impacts to the local socioeconomic conditions. The cumulative impacts to local socioeconomic conditions would be negligible.

Impacts of Proposed Alternative

The Proposed Alternative would improve telecommunications, hence improving communications necessary for businesses as well as emergency response to OPCNM and surrounding areas. It would facilitate telecommuting and thus may increase job opportunities for the population living in the rural areas serviced by TTTC. Should the Proposed Alternative be implemented, beneficial, regional, short-term, minor impacts to socioeconomics would occur due to construction-related expenditures and employment that would provide minimal economic gains for some local and regional businesses and individuals through the purchase of materials, supplies, and services. After the construction phase, the operation of the fiber optic line would increase productivity of area residents, small businesses, local law enforcement, emergency responders, and the staff of OPCNM. Further, because visitation contributes tourism-based income to the regional economy, the Proposed Alternative would also have beneficial, regional, long-term, moderate impacts on socioeconomics.

Cumulative Impacts

Other current and foreseeable projects in the area have the potential to impact local socioeconomic conditions. Impacts to local socioeconomic conditions are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on local socioeconomic conditions). The Proposed Alternative, in conjunction with other past, present and reasonable foreseeable future actions, would contribute beneficial, regional, short- and long-term, minor to moderate cumulative impacts to socioeconomics.

Conclusion

The Proposed Alternative would result in a beneficial, regional, short- and long-term, moderate impact to socioeconomic conditions. The cumulative impacts to local socioeconomic conditions would contribute beneficial, regional, short- and long-term, minor to moderate cumulative impacts to socioeconomics.

Adjacent Lands

Organ Pipe Cactus National Monument is bordered on the east by the Tohono O'odham Nation (population 11,000), on the west by the Cabeza Prieta National Wildlife Refuge, and on the north by BLM land. The project will not occur within the Cabeza Prieta National Wildlife Refuge or the Tohono O'odham Nation, but it will occur within BLM lands.

The BLM is required to manage public lands under a multiple-use approach which includes the designation of transportation and utility corridors on federal lands where they are necessary for public safety and welfare. The BLM lands within the proposed project area are subject to the Approved Amendment to the Lower Gila North Management Framework Plan and the Lower

Gila South Resource Management Plan and Decision Record (DOI 2005). Based on this plan, the project limits of the Proposed Alternative is within the Lower Gila South Resource Management Plan (RMP) Planning Boundary, within the Ajo Management Area. The proposed project limits are within BLM Managed Lands for which no habitat category for desert tortoise has been designated.

The project limits are within the Recreation Opportunity Spectrum mapped as Roaded Natural (DOI 2005) where there are about equal opportunities for affiliation with other user groups and for isolation from sights and sounds of humans, there is opportunity to have a high degree of interaction with the natural environment, and opportunities for both motorized and nonmotorized recreation are present. In Roaded Natural areas, challenge and risk opportunities are not very important except in specific challenging activities, and practice of outdoor skills may be important. Roaded natural areas are characterized by a generally natural environment with moderate evidence of humans, and resource modification and utilization practices are evident, but they harmonize with the natural environment. Concentration of users is low to moderate in these areas, facilities are sometimes provided for group activity, and on-site controls and restrictions offer a sense of security. In Roaded Natural areas, rustic facilities are provided for use convenience as well as for safety and resource protection, and conventional motorized use is provided for in construction standards and design of facilities. Activity opportunities include, but are not limited to: camping, hiking, climbing, enjoying scenery or natural features, nature study, photography, spelunking, hunting (big game, small game, upland birds, waterfowl), ski touring and snowshoeing, swimming, diving (skin and scuba), fishing, canoeing, sailing, river running (motorized craft), off-highway vehicle use (four-wheel-drive, dune buggy, dirt bike, snowmobile, power boating), picnicking, rock collecting, wood gathering, auto touring, downhill skiing, snowplay, ice skating, waterskiing and other water sports, hang gliding, interpretive use, rustic resorts and organized camps.

The project limits are mapped as Visual Resource Management Class IV where changes may subordinate the original composition and character but must reflect what could be a natural occurrence within the characteristic landscape (DOI 2005). The project limits are included in the Limited Motor Vehicle Use area within the Off-Highway and Special Recreation Vehicle Use map. Limited Motor Vehicle Use areas are designated areas and trails where the use of vehicles is subject to restrictions, such as limiting the number or type of vehicles allowed, dates and times of use (seasonal restrictions), limiting use to designated or existing roads and trails. Combinations of restrictions are possible, such as limiting use to certain types of vehicles during certain times of the year. The proposed project limits are also within the Ajo Special Recreation Management Area and lands not prospectively valuable for oil and gas. Finally, in the Lower Gila South RMP, Final Environmental Impact Statement (EIS) (DOI 1988), ten utility corridors were identified within the RMP/EIS boundary; however, the corridor for the Proposed Alternative was not identified in the RMP/EIS.

Impact Intensity

For this analysis, the estimated effects of the alternative actions on adjacent lands were derived from available information in a recent Environmental Assessment prepared and approved for another federal action within OPCNM (NPS 2003a). The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Adjacent land agencies would not be affected, or the effect would be at or below the lower levels of detection, and it would not have an appreciable effect on adjacent lands.

- Minor:* The effect would be detectable, but it would be of a magnitude that it would not have an appreciable adverse or beneficial effect on adjacent lands. If mitigation was needed to offset adverse effects, it would be relatively simple and successful.
- Moderate:* The effect would be readily apparent, and it would result in a substantial adverse or beneficial change to adjacent land agencies in a manner that would be noticeable to staff and the public. Mitigation measures would probably be necessary to offset adverse effects, and it would likely be successful.
- Major:* The effect would be readily apparent, and it would result in a substantial adverse or beneficial change to adjacent land agencies in a manner that would be noticeable to staff, the public, and it would be markedly different from existing conditions. Mitigation measures to offset adverse effects would be needed, could be expensive, and their success could not be guaranteed.

Impacts of No-Action Alternative

Under the No-Active Alternative, the fiber optic line would not be installed, and there would be no measurable effect to BLM, Cabeza Prieta National Wildlife Refuge or Tohono O'odham Nation lands. The No-Action Alternative would result in no to negligible impacts to adjacent lands.

Cumulative Impacts

Other current and foreseeable projects in the area have the potential to impact adjacent lands. Impacts to adjacent lands are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on adjacent lands). The No-Action Alternative, in conjunction with other past, present and reasonable foreseeable future actions, would result in negligible cumulative effects to adjacent lands.

Conclusion

Under the No-Active Alternative, the fiber optic line would not be installed, and there would be no to negligible impacts to adjacent lands. The cumulative impacts to adjacent lands would be negligible.

Impacts of Proposed Alternative

The Proposed Alternative would improve telecommunications within OPCNM and for some TTTC residents within the region; however, it will not occur within the Tohono O'odham Nation or Cabeza Prieta National Wildlife Refuge. Hence, the Proposed Alternative would result in no to negligible impacts to the Tohono O'odham Nation and the Cabeza Prieta National Wildlife Refuge.

The implementation of the Proposed Alternative would result in the same adverse and beneficial, localized to regional, short- and long-term, negligible to moderate impacts to resources on BLM lands as those impacts to resources within OPCNM (see Chapter II, Table 2). There is a campground on BLM lands west of the project limits, but there no telephone is provided at the campground. Although there are currently no communications available at this campground, this project would provide an opportunity for the BLM to install a telephone at this

or other locations in the future; therefore, in terms of communications, the Proposed Alternative would result in additional beneficial, localized, long-term, moderate impacts to the BLM.

Cumulative Impacts

Other current and foreseeable projects in the area have the potential to impact adjacent lands. Impacts to adjacent lands are occurring on lands managed by the federal government, the State of Arizona, and private landowners. Past, present and foreseeable future impacts have and could include road construction or improvement; livestock grazing; mineral extraction; construction of homes, businesses and associated utility lines; fences; and development associated with public use of park units (see Appendix E for a list of specific project actions having cumulative impact on adjacent lands). The Proposed Alternative, in conjunction with other past, present and reasonable foreseeable future actions, would result in negligible cumulative effects to adjacent lands.

Conclusion

The Proposed Alternative would result in no to negligible impacts to the Tohono O'odham Nation and the Cabeza Prieta National Wildlife Refuge. The implementation of the Proposed Alternative would result in the same adverse and beneficial, localized to regional, short- and long-term, negligible to moderate impacts to resources on BLM lands as those impacts to resources within OPCNM (see Chapter II, Table 2). The Proposed Alternative would also result in future, beneficial, localized, long-term, moderate impacts to the BLM in terms of communications. The cumulative impacts to adjacent lands would be negligible.

IV. CONSULTATION AND COORDINATION

AGENCIES/TRIBES/ORGANIZATIONS/INDIVIDUALS CONTACTED

The scoping process identifies the resources that may be affected by a project proposal, and explores the possible alternative ways of achieving the proposal while minimizing impacts. In November 2006, the *Ajo Copper News* printed a story about the proposed project. A planning team consisting of NPS and RUS representatives held internal scoping and planning sessions at OPCNM to prepare, review and comment on the alternative designs for the construction of the fiber optic project. No public scoping meetings were held, but external scoping was conducted with the public and interested and affected groups and agencies. A public scoping letter dated 12 December 2006, was mailed to the following interested and affected parties:

Ajo Chamber of Commerce
Ajo Copper News
Ajo Corridor Times
Arizona Department of Environmental Quality
Arizona Game and Fish Department
Arizona State Land Department
Arizona Wilderness Coalition
Bureau of Land Management
Cabeza Prieta National Wildlife Refuge
Cabeza Prieta Natural History Association
Center for Biological Diversity
Defenders of Wildlife
Hia-Ced O'odham Alliance
International Sonoran Desert Alliance
National Parks Conservation Association
The Nature Conservancy in Arizona
Tohono O'odham Tribal Council

In February 2007, follow-up phone calls or e-mails were made to those interested and affected parties that did not respond to the December 2006 mailing. The following comments were received:

Arizona Department of Environmental Quality (ADEQ) – The ADEQ provided two letters. One letter (dated 22 January 2007) stated that the ADEQ Air Quality, Water Quality, Waste Programs and Tank Programs divisions have advised the office of the Administrative Counsel that no comments are forthcoming at this time.

The second letter (dated 29 January 2007) was from the Water Quality Division, and it noted that ADEQ has not identified any impaired waters in the vicinity of the project, and that any surface waters affected by this project are likely ephemeral waters. The letter also stated that an AZPDES Stormwater permit would be required for this project due to the point source discharge to surface waters of the U.S. The letter noted that the Construction Stormwater Permit, further information, and associated forms are available on ADEQ's website.

Arizona State Land Department (ASLD) – On 15 February 2007, Jamie Galleda (ASLD) left a phone message that their policy does not allow them to provide comments in response to

scoping for an Environmental Assessment and that questions should be directed to their public records counter in Phoenix or to their website.

Bureau of Land Management (BLM) – In an e-mail dated 6 February 2007, the BLM (Nona Baheshone, Project Manager, Phoenix District Office) noted that the BLM Phoenix District Office, Lower Sonoran Field Office, has not received an application for a ROW to access BLM land for the planned improvements. TTTC was advised to contact the BLM office to schedule a meeting to discuss its application for a ROW across BLM land. The BLM also noted that they had placed a call to Mary Kralovec at National Park Service to discuss the project. In addition, the BLM (Rich Hansen) called on 13 February 2007 and provided copies of the Final Lower Gila South Resource Management Plan Environmental Impact Statement (DOI 1988) and the Approved Amendment to the Lower Gila North Management Framework Plan and the Lower Gila South Resource Management Plan and Decision Record (DOI 2005). Finally, the BLM (Lori Young, personal communication, biologist, 25 July 2006) has requested that a copy of the final Biological Evaluation be sent to her for review.

In addition, the U.S. Fish and Wildlife Service and the Arizona Game and Fish Department were contacted for the preparation of the Biological Evaluation, and the following responses were received:

Arizona Game and Fish Department (AGFD) – In response to a scoping letter for the Biological Evaluation, the AGFD accessed their Heritage Data Management System (HDMS) and provided a letter (31 May 2006) listing special status species within three miles of the project limits (Appendix D).

U.S. Fish and Wildlife Service (USFWS) – In a letter dated 14 July 2006, the USFWS provided technical assistance related to the potential impacts to endangered species as a result of the proposed project. In a letter dated 6 June 2007, the USFWS provided a concurrence letter in response to a request to initiate informal consultation (Appendix A).

Finally, the Cultural Resource Survey for the project limits was transmitted to the Arizona State Historic Preservation Office (SHPO) for their review in May 2006.

PREPARERS

Canyon Consulting

Angela Barclay, Natural Resource Consultant, B.S. Management Studies, B.S. Wildlife and Fisheries Sciences, and M.S. Wildlife and Fisheries Sciences. Responsible for ecological analysis. Experience: 12 years in field experience, environmental planning, assessment, and compliance in southern Arizona.

Paul Langdale, NEPA Planner, B.S. Ecology and Evolutionary Biology. Responsible for technical review of document. Experience: 15 years of field experience in southern Arizona and five years in NEPA planning.

Jessica Gist, Biologist, B.S. Ecology and Evolutionary Biology. Responsible for preparing small portions of document and editing document. Experience: Two years in biological survey and conservation.

CONTRIBUTORS

National Park Service

Organ Pipe Cactus National Monument

Baiza, Lee. Superintendent

Bryant, Bob. Facilities Manager

Kralovec, Mary. Supervisory Resource Management Specialist

Rutland, Susan. Botanist

Patton, Fred. Chief Ranger

Tibbitts, Tim. Wildlife Biologist

Tuomey, Joe. Cultural Archeologist

AGENCIES, TRIBES, ORGANIZATIONS, AND INDIVIDUALS NOTIFIED ABOUT THE DOCUMENT

Ajo Chamber of Commerce

Ajo Copper News

Ajo Corridor Times

Arizona Department of Environmental Quality

Arizona Game and Fish Department

Arizona State Land Department

Arizona Wilderness Coalition

Bureau of Land Management

Cabeza Prieta National Wildlife Refuge

Cabeza Prieta Natural History Association

Center for Biological Diversity

Defenders of Wildlife

Hia-Ced O'odham Alliance

International Sonoran Desert Alliance

National Parks Conservation Association

The Nature Conservancy in Arizona

Tohono O'odham Tribal Council

V. REFERENCES

Arizona Department of Agriculture

1993 Arizona Native Plant Program

Arizona Game and Fish Department

2001 *Gopherus agassizii*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 11 pp.

2003a *Leptonycteris curasoae yerbabuenae*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 8 pp.

2003b *Chionactis palarostris organica*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 5 pp.

2004 *Echinomastus erectocentrus* var. *acunensis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 7 pp.

Arizona-Sonora Desert Museum

2000 A Natural History of the Sonoran Desert. Arizona Sonora Desert Museum Press, Tucson. 628 pp.

Brown, D. E.

1994 Biotic communities of the Southwestern United States and northwestern Mexico. University of Utah Press, Salt Lake City. 342 pp.

Cartron, J. L. E., W. S. Richardson, and G. A. Proudfoot

2000 The Cactus Ferruginous Pygmy Owl: taxonomy, distribution, and natural history. pp. 6-9. In: Cartron, J. L. E., and D. M. Finch, tech. eds. 2000. Ecology and conservation of the Cactus Ferruginous Pygmy-owl in Arizona. Gen. Tech. Rep. RMRS-GTR-43. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 68 pp.

Cockrum, E. and Y. Petryszyn.

1986 Mammals of the Organ Pipe Cactus National Monument, Special Report Number 5, Cooperative National Park Resources Studies Unit, University of Arizona.

Department of Interior

1998 Lower Gila South Resource Management Plan and Environmental Impact Statement, Phoenix District, Arizona, Final. Bureau of Land Management. 299 pp.

2005 Approved Amendment to the Lower Gila North Management Framework Plan and the Lower Gila South Resource Management Plan and Decision Record. Bureau of Land Management. 73 pp.

- Groschupf, K., B. T. Brown, and R. R. Johnson
1988 Checklist of the Birds of Organ Pipe Cactus National Monument. Cooperative National Park Resources Study Unit, University of Arizona. Southwest Parks and Monument Association.
- Hendricks, D. M.
1985 Arizona Soils. College of Agriculture, University of Arizona, Tucson, Arizona. p. 75.
- Lowe, C.H. and P.C. Rosen
1990 Checklist of the Amphibians and Reptiles at Organ Pipe Cactus National Monument. Cooperative National Park Resources Study Unit, University of Arizona.

1996 Ecology of the Amphibians and Reptiles at Organ Pipe Cactus National Monument, Arizona, Technical Report No. 53. National Biological Service, Cooperative Park Studies Unit, School of Renewable Natural Resources, University of Arizona, Tucson. 138 pp.
- MacMahon, J. A.
1985 Deserts. National Audubon Society Nature Guides. Alfred A. Knopf, Inc. New York. 638 pp.
- National Park Service, U.S. Department of Interior
1991 A Checklist of Mammals, Amphibians, and Reptiles of Organ Pipe Cactus National Monument. Southwest Parks and Monuments Association, Tucson.

1994 Organ Pipe Cactus National Monument Natural and Cultural Resources Management Plan.

1995 Draft General Management Plan, Development Concept Plan, Environmental Impact Statement, Organ Pipe Cactus National Monument. Organ Pipe Cactus National Monument, AZ.

1998 General Management Plan and Development Concept Plan, final Environmental Impact Statement, Organ Pipe Cactus National Monument, Ajo, Arizona. Intermountain Regional Office, Denver, Colorado.

2000 Director's Order #47, Natural Sounds. Washington, D.C. October.

2001 Management Policies 2001. Washington, D.C.

2002 Procedural Manual #77-2, Floodplain Management. Washington, D.C. October.

2003a Organ Pipe Cactus National Monument/Coronado National Memorial, Arizona, Proposed Vehicle Barrier, Environmental Assessment

2003b Organ Pipe Cactus National Monument, Arizona, Visitor Center Area Parking and Roadway Modifications, Environmental Assessment

- 2004 Capulin Volcano National Monument, New Mexico, Fire Management Plan, Environmental Assessment/Assessment of Effect.
- 2005 Statistical Abstract, Public Use Statistics Office, Denver, Colorado. 75 pp.
- Petryszyn, Y. and E. L. Cockrum
1990 Mammals of the Quitobaquito Management Area, Organ Pipe Cactus National Monument, Arizona. Technical Report No. 36. Cooperative National Park Resources Studies Unit, School of Renewable Natural Resources, University of Arizona, Tucson.
- Pima County
2000 Priority Vulnerable Species Habitat Data Analysis. Sonoran Desert Conservation Plan. pp. 20-22.
- Post, D. F.
1990 Summary of Soils Information Available At Organ Pipe Cactus National Monument and Discussion of Research Needs. Special Report No. 10 - Assessment of Scientific Information and Activities at Organ Pipe Cactus National Monument Biosphere Reserve. USDI, NPS, Cooperative National Park Resources Studies Unit, University of Arizona, Tucson, Arizona.
- Steere, P.
2006 Cultural Resource Survey for a Twenty-Seven-Mile Fiber Optic Line Right-of-Way, Through the Organ Pipe Cactus National Monument/Along State Highway 85 from Lukeville to Why, Pima County, Arizona. Technical Report No. 06-2. 41 pp.
- U.S. Environmental Protection Agency
1996 Draft Environmental Justice Guideline. Washington, DC.
- U.S. Fish and Wildlife Service, U.S. Department of Interior
2000 Cactus Ferruginous Pygmy-owl Survey Protocol.
- Warren, P. L., B. K. Mortenson, B. D. Treadwell, J. E. Bowers, and K. L. Reichhardt
1981 Vegetation Of Organ Pipe Cactus National Monument, Technical Report No. 8. Applied Remote Sensing Program, Office Of Arid Lands Studies, University Of Arizona, Tucson. 75 pp.

APPENDIX A

**U.S. FISH AND WILDLIFE SERVICE
TECHNICAL ASSISTANCE AND
INFORMAL CONSULTATION CONCURRENCE LETTERS**



United States Department of the Interior

U.S. Fish and Wildlife Service
 Arizona Ecological Services Field Office
 2321 West Royal Palm Road, Suite 103
 Phoenix, Arizona 85021-4951



Telephone: (602) 242-0210 Fax: (602) 242-2513

In Reply Refer to:

AESO/SE
 22410-2006-TA-0528

July 14, 2006

Ms. Angela Barclay
 Cottonwood Environmental Consulting, LLC
 2509 North Campbell Avenue, PMB #99
 Tucson, Arizona 85719

Dear Ms. Barclay:

Thank you for your correspondence of April 12, 2006, requesting technical assistance related to endangered species. Specifically, you requested our input regarding the proposed installation of a fiber optic line adjacent to Highway 85 between Why and Lukeville in Pima County, Arizona. The project falls within the range of the lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*; LLNB), a species listed as endangered under the Endangered Species Act (Act), the Sonoran pronghorn (*Antilocapra americana sonoriensis*; pronghorn), also listed as endangered, and the Acuña cactus (*Echinomastus erectocentrus* var. *acuñensis*), a plant species that is a candidate for listing under the Act. In addition, the project falls within suitable habitat for the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*; pygmy-owl), a species formerly listed as endangered under the Act. A final rule removing the pygmy-owl from the Endangered Species list was published April 14, 2006 and became effective May 15, 2006. Therefore, the protective regulations of the Act no longer apply to the pygmy-owl. However, upon request, we continue to provide technical assistance related to the conservation of the pygmy-owl.

Based on our review of the information you provided in your April 12, 2006 correspondence, we provide the following information for each of the species potentially affected by this project:

LLNB - It does not appear that any potential roosting habitat for the LLNB occurs within the project boundaries. Therefore, we do not anticipate any direct effects to roosting LLNBs. The project is within foraging distance of known LLNB roost sites in Organ Pipe Cactus National Monument (OPCNM) and Cabeza Prieta National Wildlife Refuge. These roosts are two of only three known maternity roosts for this species in the United States. The removal of saguaros, an important LLNB forage species, as a result of this project could affect this species. You have indicated that all saguaros present on the site will be preserved in place or transplanted on the project site. We emphasize the importance of this conservation measure. In addition, if project construction can occur after the saguaro fruiting season (typically, most saguaro fruits are gone by the end of August), most of the LLNBs have left these roosts and the potential for impacts would be reduced even further. If these conservation measures are implemented, we do not believe that any significant effects to the LLNB will occur as a result of this proposed project.

Ms. Angela Barclay

2

Pronghorn – As you indicated in the information you provided, most of the recent pronghorn locations have been west of SR 85. However, information gathered from 1993 – 2002 indicates that suitable pronghorn habitat still exists east of SR 85 and that pronghorn have occasionally made, or attempted to make, movements to the east side of SR 85. SR 85 represents an impediment to pronghorn movements and previous section 7 consultations have focused on reducing the potential effects of the roadway on these movements. Conservation measures have included seasonal use restrictions, reduction of speed limits, and investigating the use of underpasses. The area between highway mileposts 67 and 71 on SR 85 has been specifically identified as a potential pronghorn crossing area. Because of the extremely tenuous status of the pronghorn, any effects that this project would have on the activities and movements of pronghorn could be significant.

Pronghorn typically utilize the vicinity of this project during the fawning and summer hot seasons (March 15 – July 15). The upland Sonoran desertscrub vegetation community in the project area provides important thermal cover for pronghorn during these critical times of the year. Following the onset of the monsoon season, and its associated cooler temperatures and increased forage availability, pronghorn generally start to move back to the more western portions of their range. Timing the construction of this project to begin after the pronghorn have moved west will reduce the likelihood of impacts. We recommend that you consider waiting until after August 1 to begin construction of the fiber optic line. The relatively short-term nature of this project and the reduced disturbance limits will also help to minimize impacts to the pronghorn. We support the proposed seeding of all disturbed areas in order to restore the natural appearance of the road right-of-way.

Acuña Cactus – Based on the information you provided, it appears that only one location within the proposed project boundaries exhibits the characteristics of Acuña cactus habitat. You also provided information that OPCNM staff surveyed this particular area and no specimens of Acuña cactus were located. Based on this information, we do not anticipate any effects to the Acuña cactus as a result of this project.

Pygmy-owl - The project boundaries include suitable pygmy-owl habitat. Current survey efforts indicate that there are no active pygmy-owl territories within or adjacent to the project. However, pygmy-owls have occupied areas in proximity to SR 85 in the past. Should project activities occur within 400 meters of a pygmy-owl nesting territory during the nesting season (February 1 – July 31), the noise and activity disturbance associated with this project could affect nesting pygmy-owls. There are two options for avoiding these potential effects. First, complete construction outside of the nesting season. Because all large saguaros will be avoided, we do not anticipate direct effects to pygmy-owl nests. However, disturbance effects could occur, but would be avoided if work occurs outside of the nesting season. The second option is to conduct surveys of all potential pygmy-owl nesting habitat within 400 meters of the project prior to construction, if work will occur within the pygmy-owl nesting season. If pygmy-owls are detected, project work in those areas may have to be delayed until after the nesting season. It is also very important to implement the proposed conservation measures outlining the preservation of saguaros and large trees, as well as seeding disturbed areas with native seeds. The relatively

Ms. Angela Barclay

3

short-term nature of this project and the reduced disturbance limits will also help to minimize impacts to the pygmy-owl. With the implementation of the above conservation measures, we do not anticipate that the construction of this project will result in any significant impacts to the conservation of the pygmy-owl.

In summary, if project construction can be initiated sometime after August 1 and completed before February 1, many of the impacts to species of concern will be avoided. Timing, in conjunction with the conservation measures provided in your April 12, 2006 letter, will contribute to the reduction of potential effects associated with this project. We also recommend continued coordination with OPCNM, the Bureau of Land Management, and the Arizona Game and Fish Department to ensure that any concerns these agencies have will also be addressed.

Should circumstances regarding this project change from the information provided to us, we recommend that you contact us for further review. If you have additional questions, please contact Scott Richardson at (520) 670-6150 (x 242) or Sherry Barrett at (x 239). Thank you for your consideration of pygmy-owl conservation.

Sincerely,


for Steven L. Spangle
Field Supervisor

cc: Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
Plant Ecologist, Fish and Wildlife Service, Tucson, AZ
Erin Fernandez, Fish and Wildlife Service, Tucson, AZ
Habitat Branch Chief, Arizona Game and Fish Department, Phoenix, AZ
Regional Supervisor, Arizona Game and Fish Department, Yuma, AZ (Attn: Lin Piest)

C:\Documents and Settings\scottrichardson\My Documents\Technical Assistance\SR85FiberOpticl.Barclay.ta.sr.doc



United States Department of the Interior

U.S. Fish and Wildlife Service
 Arizona Ecological Services Field Office
 2321 West Royal Palm Road, Suite 103
 Phoenix, Arizona 85021-4951



Telephone: (602) 242-0210 Fax: (602) 242-2513

In Reply Refer to:

AESO/SE
 22410-2006-I-0528

June 6, 2007

Mr. Dennis Rankin
 Engineering and Environmental Staff
 Rural Development – Utilities Programs
 c/o Ms. Angela Barclay
 Canyon Consulting
 8916 East Calle Kuehn Street
 Tucson, Arizona 85715

Re: Fiber Optic Line, State Route 85: Why to Organ Pipe Cactus National Monument
 Headquarters, Pima County, Arizona

Dear Mr. Rankin:

Thank you for your correspondence of May 29, 2007, received on May 31. This letter documents our review of the Fiber Optic Line, State Route (SR) 85: Why to Organ Pipe Cactus National Monument (OPCNM) Headquarters Project in Pima County, in compliance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). Your letter concluded that the proposed project may affect, but is not likely to adversely affect, the endangered Sonoran pronghorn (*Antilocapra americana sonoriensis*). We concur with your determinations and provide our rationale below.

PROJECT DESCRIPTION

A complete description of the proposed action is found in your May 29, 2007 letter; January 2007 Biological Evaluation; and in our notes taken during telephone conversations with you on February 20 and 21, 2007. Table Top Telephone Company (TTTC), a Rural Utilities Service Company, proposes to install a new fiber optic line adjacent to SR 85 between Why and OPCNM (22 miles) to provide additional, more reliable, and faster telecommunications networking services to the areas currently served by TTTC. The entrenched fiber optic line will be installed on the west side SR 85 at least 12 feet from the edge of SR 85 asphalt. Trenches will be dug using a mechanical plow and will be 48 inches deep by one foot wide. The total impact of digging the trench will be about 10 feet wide for the length of the project corridor (this equates to a total impact of about 27 acres [10 feet x 22 miles]). Project work will begin on July 1, 2007 in Why and will take about 140 days to complete. Project work will reach the northern boundary of OPCNM on or after August 1, 2007.

Mr. Dennis Rankin

2

To minimize project impacts, including those to pronghorn, numerous conservation measures will be implemented, including, but not limited to, the following:

- Large cacti and trees will not be removed and will be bored underneath, trenched around, or trimmed (trees only).
- Washes will not be trenched through; instead the line will be bored under washes and through rocky areas as well.
- Trenches will be backfilled immediately and the disturbed area within the project limits may be hydroseeded (with a seed mix containing vegetation indigenous to the project area) or left alone and allowed to reseed naturally, depending on the guidance from biologists with OPCNM and ADOT.
- Project work will begin in Why, outside of the Sonoran pronghorn range, and will only be conducted within the pronghorn range after July 31; this is after the fawning and summer hot seasons (March 15-July 15), the time when pronghorn typically use the southeastern portion of their range (i.e., OPCNM).
- The resident engineer and construction crews will be trained to identify pronghorn and will scan for them regularly when construction occurs within the pronghorn range. Additionally, the engineer will be in regular communication with OPCNM and/or the Arizona Game and Fish Department (AGFD) to obtain the most recent pronghorn locations, if any, in the project vicinity. If Sonoran pronghorn are encountered, construction crews will stop all activity and allow the pronghorn to move away in the direction and at the speed of their choosing. If pronghorn do not move from the area within five minutes, construction crews will slowly turn around and retreat from them, if at all possible. If retreat (even temporary) is not possible, construction crews will continue on their current route at a slow speed (<15 miles per hour), as long as this is not toward the pronghorn. Construction crews will continue at a slow speed until they are greater than one mile from the pronghorn or have put a topographic barrier between themselves and the pronghorn.

CONCLUSION

Sonoran Pronghorn

We concur that the proposed action may affect, but is not likely to adversely affect, the Sonoran pronghorn for the following reasons:

- Project construction within the range of the pronghorn will take place after July 31, outside of the fawning and summer hot seasons (the time [March 15-July 15] during which pronghorn typically use habitat within the general vicinity of the project). Additionally, the resident engineer will be in regular communication with OPCNM and/or AGFD to obtain the most recent pronghorn locations, if any, in the project vicinity

Mr. Dennis Rankin

3

from the pronghorn. Therefore, any potential direct effects, from noise and activity disturbance from or collision with project-related vehicles, to pronghorn are discountable.

- Native vegetation, which provides forage and cover habitat for pronghorn, will be impacted. This impact, however, is relatively small (27 acres) in comparison to the size of the current pronghorn range within Arizona (approximately 1,605,120 acres) and will only be temporary, as the trenched areas will be backfilled and either hydroseeded with native vegetation or allowed to reseed naturally. Additionally, large trees and wash vegetation, both of which provide important thermal cover to pronghorn, will not be disturbed. Therefore, any indirect effects to pronghorn, resulting from loss of forage or cover habitat, are insignificant.

Thank you for your continued coordination. No further section 7 consultation is required for this project at this time. Should project plans change, or if information on the distribution or abundance of listed species or critical habitat becomes available, this determination may need to be reconsidered. We also encourage you to continue coordinating with AGFD. In all future correspondence on this project, please refer to consultation number 22410-2006-I-0528.

Though the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) is no longer listed under the ESA, we continue to be concerned about its conservation. We therefore thank you for including conservation measures for this species in your project description. Should you require further assistance or if you have any questions, please contact Erin Fernandez (x238) or Jim Rorabaugh at (x230) at (520) 670-6150.

Sincerely,



for Steven L. Spangle
Field Supervisor

cc: Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Regional Supervisor, Arizona Game and Fish Department, Yuma, AZ
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
Superintendent, Organ Pipe Cactus National Monument, Ajo, AZ

W:\Erin Fernandez\Table Top fiber optic SR85 concurrence May 31 07.doc:egg

APPENDIX B

CONSTRUCTION PLAN

The project proposes to install a buried fiber optics line on the west side of SR85 between Why and OPCNM headquarters in southwestern Pima County.

Proposed Route

The project proponents are proposing to install 22 miles of fiber optics line along SR85 between Why and the OPCNM headquarters, within unincorporated Pima County, Arizona in portions of: Township 13 South, Range 5 West, Sections 25, 35 and 36; Township 14 South, Range 5 West, Sections 2, 11, 14, 23, 26, 27 and 34; Township 15 South, Range 5 West, Sections 3, 10, 15, 22, 27, 33 and 34; Township 16 South, Range 5 West, Sections 4, 8, 9, 17, 20, 29 and 32, and; Township 17 South, Range 5 West, Sections 5 and 8.

Land Management

The project limits lie mostly within OPCNM, but also crosses portions of Arizona State Trust lands, Bureau of Land Management land, and private lands.

Telecommunications Cable

The project includes construction, operation, and maintenance of a telecommunications cable and ancillary facilities. The cable is a 48-pair fiber optic line with a protective sheathing. It is encased in a 1.5-inch conduit. The telecommunications cable is completely dielectric and does not emit any noise or electric magnetic fields. Ancillary facilities include: splice boxes on average of every four miles, and centerline markers on average of every 1,200 to 2,000 feet. Construction would follow RUS specification codes.

Ancillary Facilities

Ancillary facilities include: underground cable splice vaults, or "handholes," located approximately every four miles. The vaults are 36 inches by 36 inches by 48 inches, with a composite concrete construction, light duty traffic-bearing lid and no attached base. The unit is buried completely to restrict access. The vault locations would be marked for maintenance, repairs, and expansion needs. In addition, to locate the buried cable, a technician must have access to the metallic component of the cable in order to connect a cable-locating device. Both of these functions are accomplished using a cable-locating assembly.

Phasing

The proposed project would be completed in two phases. Phase I is placing the conduit and ancillary facilities underground. Phase II would include the pulling and splicing of the communications cable through the conduit and any necessary final restoration and cleanup operations. The pulling crew would consist of a pulling or blowing machine, one backhoe, cable trailer, and two trucks.

Construction Sequence

Construction sequence steps are numbered below. It is important to recognize that in some circumstances, the assumed method of installation described herein may not be practical or would be impossible. In these circumstances, the construction manager and resident engineer would make a determination of a suitable solution as an exception. This section describes the typical construction sequence for the project:

1. Install barriers (e.g., tape and stakes) to establish no construction zones around sensitive resources. Plant salvage and disposal techniques (transplanting, avoidance, etc.) would be determined and jointly agreed to by land management agencies and TTTC prior to construction.
2. Conduct necessary removal of vegetation prior to installation of the communications line.
3. Install conduit within the right-of-way (ROW) with track-mounted plow or trenching.

4. Install conduit at drainage and road crossings using the open cut, plow, directional boring, trenching over or under existing culverts, or bridge attachment methods as appropriate.
5. Excavate buried access vaults.
6. Pull cable through the conduits.
7. Place marker signs.
8. Splice and test cable and backfill buried access vaults.
9. Conduct site cleanup/restoration.

Conduit Installation

It is estimated that the trench that would be dug for the fiber optics would be 36 inches deep by one foot wide. The impact as a result of digging the trench (i.e., to accommodate equipment) will be no more than 10 feet wide. Trenches would be dug using a vibratory plow. Trenches would not be dug through washes and areas with rocky substrates; rather the fiber optics line would be bored under washes and through these rocky areas using a horizontal directional drilling rig. The fiber optics would be placed at least 12 feet from the edge of SR85 asphalt, with a maximum distance of disturbance at 30 feet from the edge of asphalt. Ingress and egress routes to and from the construction sites will be required approximately every ½ mile, and the ingress/egress routes for trenching equipment will use the ingress/egress routes previously used by boring equipment; these locations would be approved by OPCNM personnel prior to construction. The total project disturbance would be less than 27 acres (22 miles [116,160 feet long x 10 feet wide = 1,161,600 feet²] + 44 ingress/egress routes [44 x 10 feet wide x 20 feet long = 8,800 feet²] = 1,170,400 feet²).

To minimize disturbance, all construction equipment will be rubber-tracked and will avoid impacts to and navigate around sensitive areas (i.e., washes, cultural sites, and sensitive plants). When bores are required, equipment will be off loaded then walked to the bore site, and the support equipment (i.e., Vac-Truck and water tank will be next to or behind the bore machine). Once the bore is completed, the equipment will be removed from the ROW. The same procedure will occur when the trenching machine is used. Fill slopes will either be bored, or trenched depending on terrain and the degree of the slope. Boring is the preferred method for fill slopes to reduce the chance of erosion. When trenching is done on a fill slope, compaction will be required at 95%.

Three methods may be used to install the conduits: plowing, trenching and directional boring.

Plowing

The conduits would be installed using either a Ditch Witch HT185 vibratory plow or a Vermeer P185 Renegade vibratory plow. Both of these machines are track driven and can be fitted with backfill plow blades which allows trenches to be dug and then backfilled immediately after laying the fiber optics line in the trench.

The conduits are fed either from the tractor plow, or a separate truck-mounted reel, and laid directly between 36 and 42 inches. There is no excavation of material, although soil displacement and stirring occurs. A compaction machine follows directly behind and returns the soil to a recognized standard measure of compaction. The running line may be "pre-ripped" if necessary to loosen the soil and identify the location of sub-surface rock or other buried obstructions.

If required to ensure a smooth continuous plowing operation, a pull tractor may be used in tandem with the plow unit to provide additional power. The tractor plow would be capable of extending and offsetting the load to maintain the required minimum depth and proper alignment

under varied terrain conditions. The plow chute is designed to allow the conduits to pass through without binding or bending. The completed plow operation installs the conduits into the ground, at the specified depth, in a narrow plow slot that is self-closing behind the plow. Only minor compaction is required to restore the ground to its original density.

Rocks and boulders would be pushed out of the plow line, then either pushed back after the plow train has passed or used elsewhere along the ROW. Permission would be obtained from the OPCNM or the appropriate land managing agency prior to removing any large boulders from the ROW.

Trenching

The trench method is used when the working environment or other conditions preclude the plow method. This method is less efficient because of lower production capability, and greater compaction and cleanup requirements. The trench method uses a backhoe or a "wheel" or "chain" trenching machine. Selection of the actual machine to be used is based on the environment in which the machine must work. All variations of the trenching operation require that a trench of sufficient width and depth be excavated to allow the installation of conduits to the specified configuration and minimum cover. The conduits are placed in the bottom of the open trench by a separate operation, and the excavation is backfilled and compacted to restore the ground to original condition and density.

Segments within narrow ROW, or segments that are heavily congested with existing sub-structures or that contain rock, are best suited for a backhoe. Segments with fewer obstructions or requiring less careful "probing" are better suited for a trenching machine. Trenching machines are capable of much greater productivity than an excavator and generally cut a "cleaner" trench.

When the material to be trenched is solid rock, a rock saw is used to cut down approximately three feet. The rock removed from the trench would be replaced in the trench after conduit installation. The conduit is laid in the bottom of the trench and at least 36 inches of cover is applied. The cover may be ground rock from the rock saw, gravel from an approved private source, or a slurry mixture of gravel and concrete to rapidly achieve needed compaction and protection over the conduit.

Directional Boring

Trenches would not be dug through washes and areas with rocky substrates. In such areas, the fiber optics line would be bored under washes and through rocky areas using a track driven Ditch Witch JT2720 Mach 1 - Tier 2 horizontal directional drilling tractor.

Directional boring is used when it is necessary to place conduits underground without disturbing the ground surface, and when surface or sub-surface conditions otherwise preclude plowing or trenching. Existing asphalt roads, highways, and driveways, utilities, railroad tracks, cultural resources, irrigation canals, and specified washes, would be avoided by directionally boring. The depth of the bore would be as required by the jurisdictional agency involved at each location. In general, bore depths below the bottom of the concrete-lined channels and unlined drainage facilities are at least five feet. In general, the greater the depth and distance of the bore, the farther back the rig must be set. Most bores require at least a 50-foot setback for operational reasons. All setbacks would be contained within the 20-foot temporary construction easement.

The directional boring process can bore significant lengths, and can maintain control of the "boring head" with a high degree of accuracy. Directional boring is conducted with several types of horizontal boring rigs, including trailer-mounted and larger self-contained units. These rigs are capable of directing the boring tip of the bore and controlling it in both horizontal and vertical planes. A sensor placed behind the bore bit allows tracking of the depth and position of the bore head. This process uses an electronic locating device installed in the head of the bore, and a companion locator used to scan the ground surface to determine the actual location and depth of the bore. The "bore stem" is typically 2 to 3 inches in diameter. When the location and depth of the bore head is located, the machine operator can stop the bore rotation and redirect the head to make any desired changes in depth or direction.

Directional bores may be completed dry (as in the jack and bore method), using only water, or with boring mud. Boring mud used in directional boring is generally formulated by mixing approximately 50 pounds of bentonite to each 300 gallons of fresh water. The dirt that is removed in the boring operation would be liquefied with the water and/or boring mud and pulled back through the borehole with the water/boring mud. If boring mud is used, the liquefied mixture would be accumulated at the entrance site, then either pumped with a sump pump to the filter on the boring rig to recycle the bentonite, or removed with a vacuum truck and then put through the bentonite filter. In areas inaccessible to vacuum trucks, it may be necessary to manually remove the mud and transport, via a watertight truck, away from the bore site for disposal at a pre-approved disposal site. Most of the bentonite used in the bore can be recovered and used again, thus minimizing site impacts.

Construction Crew

The construction crew would include:

- One bore crew: two to four people
- One ROW clearing crew: operators, laborers, and chain saw operators
- One plow train crew: ten to twelve operators, flagmen, supervisors and inspector
- Pulling or blowing crew: two to four operators and laborers
- Clean-up crew: two to four operators and laborers
- In such cases where road sweepers are necessary, flagmen would also be used.

Other personnel required on the job at any given time are fuel, maintenance, and delivery people. Crews listed above are not necessarily discreet groups. For instance, a laborer may serve one day on the cleanup crew and another on the ROW clearing crew. It all depends on the project progress and daily demand.

Pollution Prevention and Restoration Plans

A Storm Water Pollution Prevention Plan (SWPPP) and a Restoration Plan will be developed and adhered to during and after construction.

APPENDIX C

CONSULTATION LETTER SENT TO ARIZONA STATE HISTORIC PRESERVATION OFFICE

Canyon Consulting
8916 E. Calle Kuehn Street
Tucson, Arizona 85715
520 907-5674

May 18, 2006

State Historic Preservation Office
Arizona State Parks, 1300 W. Washington,
Phoenix, AZ 85007

Technical Report No. 06-2

For your review the Cultural Resource Survey for the twenty seven mile fiber optic line, right-of-way, through the Organ Pipe Cactus National Monument along Arizona State Highway 85 from Lukeville to Why, Pima County, Arizona.

Survey completed April 22, 2006, for Table Top Telephone Company, and Organ Pipe National Monument. Please address comments to Peter Steere or John Ross, Canyon Consulting.

APPENDIX D

ARIZONA GAME AND FISH DEPARTMENT HERITAGE DATA MANAGEMENT SYSTEM SPECIAL STATUS SPECIES INFORMATION LETTER



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT

2221 WEST GREENWAY ROAD
 PHOENIX, AZ 85023-4399
 (602) 942-3000 • AZGFD.GOV

GOVERNOR
 JANET NAPOLITANO
 COMMISSIONERS
 CHAIRMAN, JOE MELTON, YUMA
 MICHAEL M. GOLIGHTLY, FLAGSTAFF
 WILLIAM H. MCLEAN, GOLD CANYON
 BOB HERNBRODE, TUCSON
 W. HAYS GILSTRAP, PHOENIX
 DIRECTOR
 DUANE L. SHROUFE
 DEPUTY DIRECTOR
 STEVE K. FERRELL



May 31, 2006

Mr. John Ross
 Canyon Consulting
 8916 East Calle Kuehn
 Tucson, Arizona 85715

Re: Special Status Species Information for Multiple Township Proposed Fiber Optics Line, Pima County

Dear Mr. Ross:

The Arizona Game and Fish Department (Department) has reviewed your request, dated May 22, 2006, regarding special status species information associated with the above-referenced project area. The Department's Heritage Data Management System (HDMS) has been accessed and current records of special status species have not been documented as occurring in the project vicinity (3-mile buffer). In addition, no Designated or Proposed Critical Habitat occurs within the project vicinity. We have also included the Sonora desert tortoise handling guidelines as an attachment. The Department offers the following general comments for your consideration with more specific recommendations listed on the attachment.

The Department understands the proposed project would include the installation of an entrenched fiber optics line adjacent to State Route (SR) 85. The installation would involve digging a trench and boring under washes in addition to rocky areas. Although the project area is largely disturbed, due to the proximity to the active roadway, many species may potentially utilize the area as a linear corridor.

The Department's HDMS data are not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity.

Right of Ways (ROWs) and roads fragment landscapes by creating linear openings or corridors within otherwise contiguous vegetation patches. Due to the long recovery time of arid lands, even with active restoration efforts, the best strategy is to avoid and minimize impacts if at all possible. Habitat fragmentation is considered one of the leading causes of species endangerment and loss of biodiversity. Linear corridors (such as roads and ROWs) create an edge effect and often attract

Mr. Ross
May 31, 2006

2

brown-headed cowbirds, are found in higher densities in edge habitats (e.g., roads, ROWs) and use these linear corridors for nesting and foraging, as well as to expand into the surrounding landscape. These species affect the local vertebrate community through increased predation and brood parasitism. Additionally, corridors used by people (which any linear corridor can lend itself to) can lead to increased harassment of wildlife, both purposefully through increased poaching and inadvertently through road kill or alteration of animal behavior. Many animals will alter their movement patterns to avoid contact with people.

Non-native plants, such as Lehmann's lovegrass, often spread from disturbed areas (roadsides and ROWs) to the surrounding landscape, thereby increasing the fine fuel load and altering the frequency and intensity of fire. We recommend landscaping to include only native species of plants and a management plan for eliminating invasive species in the long term maintenance of the area. During planning and construction, minimize potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g., microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g., livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before leaving the site. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). In addition, consideration should be given to erosion control features and potential impacts to water quality.

The Department appreciates efforts to maintain natural washes for wildlife movement through development projects. We also recommend the incorporation of vegetated buffers around washes containing native vegetation, and we are currently conducting literature searches to determine desirable widths needed for particular species to continue accessing washes as urban development encroaches on the natural environment. The most significant component needed to maintain wildlife connectivity through drainage corridors and other washes is connectivity of these wash systems through planned development communities throughout the region.

The Department appreciates the opportunity to provide preliminary comments on development projects. We would like to continue this coordinated effort along with the opportunity to provide an evaluation of impacts to wildlife or wildlife habitats associated with project development when more information becomes available. In addition, various literature is available associated with open space studies and projects in Arizona. We recommend further research during the preliminary planning stages of the project for assessing, evaluating and identifying the potential measures for consideration into the project design. If you have any questions regarding this letter, please contact me at (602) 789-3593.

Sincerely,



Kelly Wolff
Project Evaluation Specialist

ARIZONA GAME AND FISH DEPARTMENT**TRENCHING GUIDELINES****DRAFT August 15, 2005****Background:**

During the construction of trenches and ditches it is important to consider potential impacts to wildlife and wildlife movement. These structures can be hazardous or cause mortality, especially in the nighttime, summer months, and wet weather months, when a high variety of species tend to be most active.

Recommendations:

- Trenches should be covered or back-filled as soon as possible. Trenching and back filling crews should be kept close together, utilizing small areas at a time minimizing the potential impacts or mortalities associated with open trenches.
- Monitor the trenches often during the construction, as well as, after construction is completed.
- Trench during the cooler months (October – March), if at all possible. However, there may be exceptions (e.g., critical wintering areas), which need to be assessed on a site-specific basis.
- Avoid leaving trenches open overnight, as this increases the chance for entrapment and mortality. Covering trenches or adding escape ramps should be considered if trenches must be left open overnight, or cannot be back-filled immediately. Trenches that have been left open overnight, especially where endangered species occur, should be inspected and animals removed prior to back filling.
- Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herptefauna (snakes, lizards, tortoise) from entering ditches. Escape ramps should be constructed at least every 90 meters and can be short lateral trenches sloping to the surface or wooden planks extending to the surface. The slope should be less than 45 degrees (100%).

Literature Cited:

New Mexico Department of Game and Fish. 1994. Guidelines for Oil and Gas Development and Fish and Wildlife Resources.

Special Status Species within a 3-mile Buffer Township 13 South, Range 5 West, Sections 25, 35, and 36; Township 14 South, Range 5 West, Sections 2, 11, 14, 23, 26, 27, and 34; Township 15 South, Range 5 West, Sections 3, 10, 15, 22, 27, 33 and 34; Township 16 South, Range West, Sections 4, 8, 9, 17, 20, 29 and 32; Township 17 South, Range 5 West, Sections 5, 8, 17, 02, 29 and 32; Township 18 South, Range 5 West, Sections 5, 6, and 7

NAME	COMMON NAME	ESA	USFS	BLM	STATE
<i>Acalypha californica</i>	California Copperleaf			S	
<i>Antilocapra americana sonoriensis</i>	Sonoran Pronghorn	LE	S		WSC
<i>Aspidoscelis burti xanthonota</i>	Red-back Whiptail	SC	S	S	
Bat Colony					
<i>Chionactis palarostris organica</i>	Organ Pipe Shovel-nosed Snake		S		
<i>Choeronycteris mexicana</i>	Mexican Long-tongued Bat	SC		S	WSC
<i>Echinomastus erectocentrus var. acunensis</i>	Acuna Cactus	C			HS
<i>Gastrophryne olivacea</i>	Great Plains Narrow-mouthed Toad				WSC
<i>Glaucidium brasilianum cactorum</i>	Cactus Ferruginous Pygmy-owl				WSC
<i>Gopherus agassizii (Sonoran Population)</i>	Sonoran Desert Tortoise	SC			WSC
<i>Leptonycteris curasoae yerbabueneae</i>	Lesser Long-nosed Bat	LE	S		WSC
<i>Lophoceros schottii</i>	Senita				SR
<i>Macrotus californicus</i>	California Leaf-nosed Bat	SC		S	WSC
<i>Masticophis bitineatus lineolatus</i>	Ajo Mountain Whipsnake		S		
<i>Myotis velifer</i>	Cave Myotis	SC		S	
<i>Phyllorhynchus browni lucidus</i>	Maricopa Leaf-nosed Snake		S		
<i>Stenocereus thurberi</i>	Organ Pipe Cactus			S	SR
Tohono O'odham Nation	Tohono O'odham Nation				

Proposed fiber optics line adjacent to SR85, Pima County. AGFD# M06-05225440

Project Evaluation Program, May 31, 2006

GUIDELINES FOR HANDLING SONORAN DESERT TORTOISES
ENCOUNTERED ON DEVELOPMENT PROJECTS

Arizona Game and Fish Department

Revised January 17, 1997

The Arizona Game and Fish Department (Department) has developed the following guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term and/or small-scale projects, depending on the number of affected tortoises and specific type of project.

Desert tortoises of the Sonoran population are those occurring south and east of the Colorado River. Tortoises encountered in the open should be moved out of harm's way to adjacent appropriate habitat. If an occupied burrow is determined to be in jeopardy of destruction, the tortoise should be relocated to the nearest appropriate alternate burrow or other appropriate shelter, as determined by a qualified biologist. Tortoises should be moved less than 48 hours in advance of the habitat disturbance so they do not return to the area in the interim. Tortoises should be moved quickly, kept in an upright position at all times and placed in the shade. Separate disposable gloves should be worn for each tortoise handled to avoid potential transfer of disease between tortoises. Tortoises must not be moved if the ambient air temperature exceeds 105 degrees fahrenheit unless an alternate burrow is available or the tortoise is in imminent danger.

A tortoise may be moved up to two miles, but no further than necessary from its original location. If a release site, or alternate burrow, is unavailable within this distance, and ambient air temperature exceeds 105 degrees fahrenheit, the Department should be contacted to place the tortoise into a Department-regulated desert tortoise adoption program. Tortoises salvaged from projects which result in substantial permanent habitat loss (e.g. housing and highway projects), or those requiring removal during long-term (longer than one week) construction projects, will also be placed in desert tortoise adoption programs. *Managers of projects likely to affect desert tortoises should obtain a scientific collecting permit from the Department to facilitate temporary possession of tortoises.* Likewise, if large numbers of tortoises (>5) are expected to be displaced by a project, the project manager should contact the Department for guidance and/or assistance.

Please keep in mind the following points:

- ! These guidelines do not apply to the Mohave population of desert tortoises (north and west of the Colorado River). Mohave desert tortoises are specifically protected under the Endangered Species Act, as administered by the U.S. Fish and Wildlife Service.
- ! These guidelines are subject to revision at the discretion of the Department. We recommend that the Department be contacted during the planning stages of any project that may affect desert tortoises.
- ! Take, possession, or harassment of wild desert tortoises is prohibited by state law. Unless specifically authorized by the Department, or as noted above, project personnel should avoid disturbing any tortoise.

RAC:NLO:rc

APPENDIX E

DEVELOPMENT ACTIONS CONSIDERED IN ASSESSING CUMULATIVE IMPACTS

The following development actions were considered in assessing potential cumulative impacts on the resource topics evaluated in the Visitor Center Area Parking and Roadway Modifications Environmental Assessment (NPS 2003b):

1. In the 1940s and early 1950s, the construction of the first residences, headquarters, and campground was completed.
2. During (1956-66) "Mission '66", a NPS service-wide effort to improve facilities and the infrastructure of the National Park system, most of the existing infrastructure at OPCNM was built. Specifically, the visitor center and access road were constructed in 1957, and the residences, maintenance yard, residence road, campground road, and campground were built and utilities upgraded in the 1960s.
3. In the 1960s (exact date unknown) the approximate 0.7 ac (0.3 ha) residence area playground was constructed.
4. In the 1960s and 1970s, the original residence, headquarters, and campground area were incrementally closed.
5. A radio shed and access road were constructed (date unknown).
6. "Tiger Cage" was constructed in a large wash approximately 0.3 mi (0.5 km) northwest of visitor center to store maintenance materials and continues to be used (construction date unknown).
7. The removal of livestock was accomplished monument-wide in the late 1970s which resulted in general beneficial effects on native vegetation density and diversity.
8. The former Volunteer-In-Parks campground was removed in the 1980s.
9. In the 1980s, approximately 1.7 ac (0.7 ha) was converted from natural vegetation to recreational vehicle parking sites for the construction of new Volunteer-In-Parks campground located within current Residence Loop drive.
10. In the early 1990s, residence trailers were removed and two duplex units, one in the main residence area and one at the campground, were constructed.
11. The maintenance shop sewer system was replaced in 1995.
12. The maintenance shop was extended in 1995.
13. Old fire hydrants were replaced in 1995.
14. In 1994-1995, residence roofs were replaced and new ramadas were constructed on all residences along main Residence Loop drive which resulted in little substantial new ground or vegetation disturbance and temporary construction noise.
15. In 1996, the duplexes were completed and landscaped.
16. In early 1997, an area approximately [0.14 ac (0.06 ha)] in size containing a thicket of plants [large stature creosote bush, acacia (*Acacia constricta*), brittlebush (*Encelia farinosa*), some paloverde and wolfberry (*Lycium* spp.)] was cleared from the leach field servicing the residence area. This project took place immediately prior to listing the pygmy-owl as endangered. In combination with other projects, this may have adversely affected pygmy-owl habitat. At the same time the vegetation was cleared, a resident pygmy-owl moved from the immediate area to the east side of SR85.
17. In 1999, buried fiber-optic cable was installed connecting the Headquarters/Visitor Center, the maintenance compound, and the residence area. Most of the length of this project was along roadside or previously-disturbed areas, except portions within the residence loop road. This led to a determination by the NPS that the project was not likely to adversely affect the pygmy-owl. The trenching resulted in an impacted area averaging 13.7 ft (4.2 m) wide through the interior of the Residence Loop road. This project took place within known pygmy-owl habitat, and in combination with other contemporary projects, this may have adversely affected pygmy-owl habitat.
18. New water/chlorination lines were installation in 1999-2000. The NPS determined that the project was not likely to adversely affect the pygmy-owl based on estimated project

disturbances; however, the actual project impact averaged 11.6 ft (3.5 m) in width, and diverted from the original projected route in some areas which resulted in greater loss of desertscrub vegetation than anticipated, including xeroriparian habitat. This project took place within known pygmy-owl habitat, and in combination with other projects, this may have adversely affected pygmy-owl habitat.

The following development actions have occurred (personal communication, Mary Kralovec, OPCNM Chief of Resources, January 2007) and were also considered in assessing potential cumulative impacts on the resource topics:

19. Reconstruction of the first five miles of the North Puerto Blanco Drive (2003). The road was widened to two lanes, with four interpretive pullouts and a parking area with picnic table at the Valley of the Ajo overlook. The remaining 25 miles of the road was closed to traffic during pronghorn fawning season (March 15 through summer). This project was project to create minor impacts and long-term benefit to pronghorns.
20. In 2004, the Arizona Department of Transportation (ADOT) completed highway and drainage improvements for SR85 within OPCNM which included: alleviating roadway flooding and sedimentation at the Cherioni Wash crossing; resurfacing the deteriorated roadway pavement; reducing storm water erosion of the roadway at 22 low-water wash crossings; upgrading the existing Alamo Wash bridge and associated drainage structures to current design standards; installing additional traffic counting and roadway safety equipment. In addition, several visitor enhancement projects were also completed (ADOT 2003).
21. In 2004, OPCNM expanded and re-configured the existing parking area at the Visitor Center and constructed a wayside north of OPCNM headquarters along SR85 (OPCNM 2003b).
22. In 2005, OPCNM installed a new water line along the Twin Peaks Campground Road to serve a campground located within employee housing.
23. In 2006, OPCNM completed construction of a vehicle barrier along the southern boundary of the monument along the U.S.-Mexico border.
24. The U.S. Customs Service installed southbound license plate readers and constructed an additional northbound through-traffic lane at the port-of-entry.

Additional reasonably foreseeable future actions include (ADOT 2003; personal communication, Mary Kralovec, OPCNM Chief of Resources, January 2007):

25. OPCNM plans to install water lines in around a campground located within employee housing in 2007.
26. OPCNM plans to place interpretive signs and informative kiosks at each wayside, as well as construct dirt trails extending from the southern and central waysides to specific points of interest.
27. OPCNM plans to expand their existing maintenance yard.
28. OPCNM is preparing a Wilderness Management Plan.