SONORAN PRONGHORN RECOVERY PLAN

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APPROVED

Director
U.S. Fish and Wildlife Service

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Date

DISCLAIMER

This is the completed Sonoran Pronghorn Recovery Plan. It has been approved by the U.S. Fish and Wildlife Service. It does not necessarily represent official positions or approvals of cooperating agencies (and it does not necessarily represent the views of all recovery team members/individuals), who played the key role in preparing this plan. This plan is subject to modification as dictated by new findings and changes in species status and completion of tasks described in the plan. Goals and objectives will be attained and funds expended contingent upon appropriations, priorities, and other budgetary constraints.

The Sonoran Pronghorn Recovery Plan, dated December 30, 1982, was prepared by the U.S. Fish and Wildlife Service in cooperation with the following members of the Sonoran Pronghorn Recovery Team: John S. Phelps (Leader), Roger DiRosa, Ted Cordery, and Terry Peters.

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1. INTRODUCTION

The Sonoran pronghorn has become endangered as a result of losses in habitat and numbers. A unique and poorly understood member of the fauna associated with the Sonoran Desert, the Sonoran pronghorn is one of the few large mammals recognized as being endangered in the United States today. The subspecific classification of this animal should not detract from its endangered status. The existing population is apparently physiologically and behaviorally unique. Biological data concerning even basic natural history information such as reproductive capabilities, water requirements, food habits and home range are not known.

A. Taxonomy

The taxonomy of the Sonoran pronghorn (Antilocapra americana sonoriensis) is poorly understood as little taxonomic material is available and the original description is based on only two specimens. The subspecies was first described by Goldman (1945) from a type specimen taken near Costa Rica, Sonora, Mexico, by Vernon Bailey and Frederic Winthrop on December 11, 1932. It was described as being the smallest subspecies of Antilocapra americana. Other differential characteristics noted were a general paler coloration and distinctive cranial features.

The major subspecific differences noted in the cranial features of A. a. sonoriensis were:

1. Skull decidedly smaller.
2. Frontal depression shallower.
3. Premaxillae less extended posteriorly along median line.
4. Auditory bullae more flattened, less projecting below level of basioccipital.

Paradiso and Nowak (1971) examined the skulls of three juvenile and one adult male Sonoran pronghorns that had been collected near Caborca in northwestern Sonora, Mexico, in February 1969. They found the four specimens to have marked similarities to the holotype of A. a. sonoriensis and to differ from the specimens of A. a. americana, mexicana, and peninsularis in the same characteristics as the holotype. They concluded that although there are still insufficient specimens to allow a complete appraisal, the four newly acquired skills provide strong support for the continued recognition of A. a. sonoriensis as a distinct subspecies. They also concluded that the taxon is more distinct from the other subspecies of pronghorn than any of them are from each other.

B. Distribution

1. Historic Distribution:

Davis (1973) provides adequate records to indicate pronghorn antelope were distributed throughout southern Arizona prior to 1900. However,

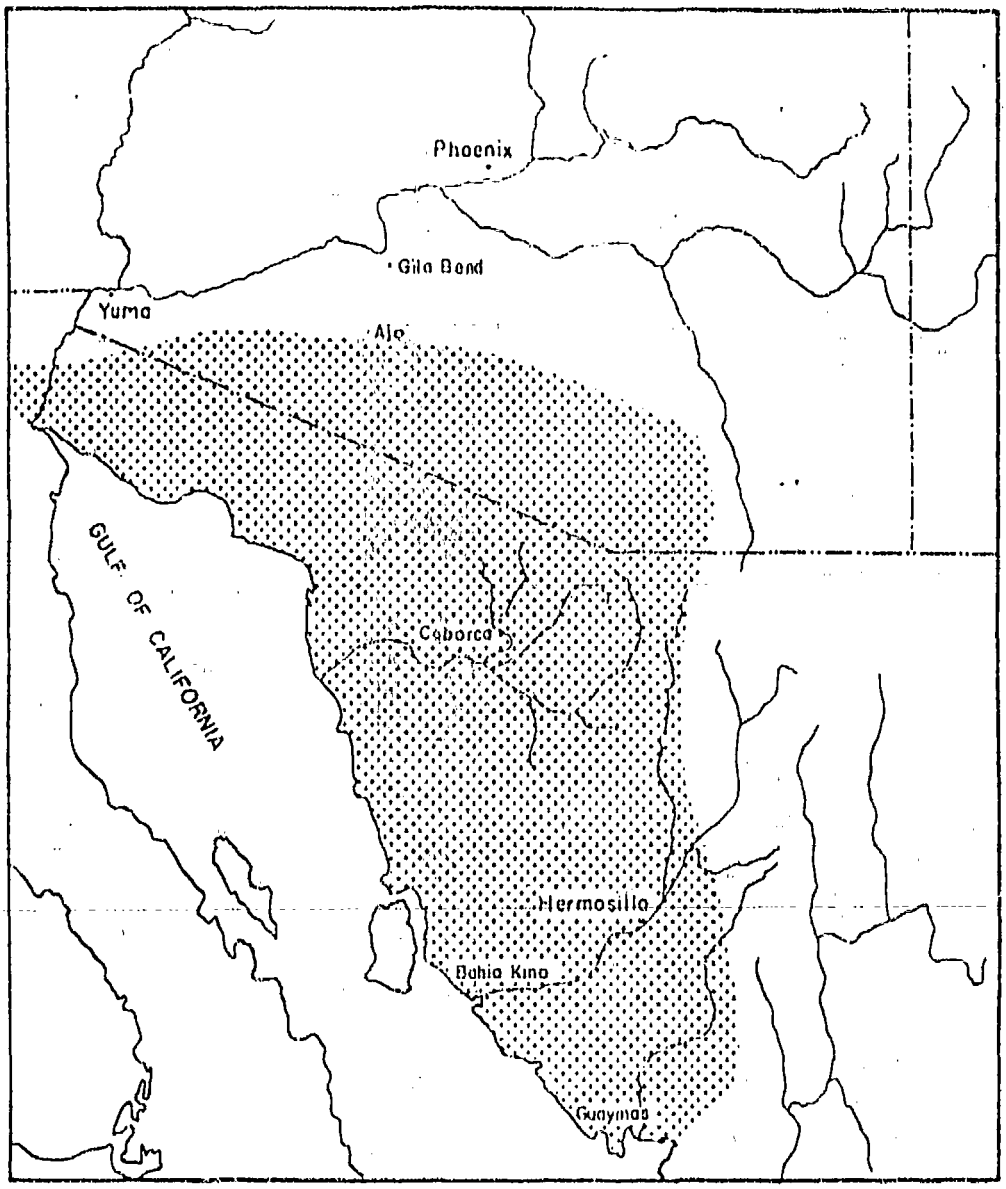

Figure 1. Historic distribution of Sonoran pronghorn antelope in Mexico and Arizona (After Hall and Kelson 1959).

the historic distribution of the Sonoran subspecies (Fig. 1) is not certain. Southern Arizona presently contains disjunct populations of both the Sonoran and Mexican subspecies (A. a. mexicana). Little material is available to taxonomists to determine the original subspecific distribution; therefore, the subspecific status of extirpated populations is unknown. The herds observed along the lower Gila River by early travelers are presumed to have been Sonoran pronghorn.

2. Present Distribution:

The Sonoran pronghorn is presently found in Arizona on the Cabeza Prieta National Wildlife Refuge, Organ Pipe Cactus National Monument and the Luke Air Force Gunnery Range. It may also occur on portions of the Papago Indian Reservation. In Mexico, the subspecies is believed to be confined to the northwestern part of the State of Sonora (Fig. 2).

Sonoran pronghorn sightings have been recorded since 1939 on the Cabeza Prieta National Wildlife Refuge and for a shorter period at the Organ Pipe Cactus National Monument. Sight records have also been recorded by Arizona Game and Fish Department personnel and other interested persons. The records include sightings on the Luke Air Force Gunnery Range and a BLM administered area just south of Ajo, Arizona. There are scattered records of antelope sightings in Mexico.

3. Life Zones:

The present range of the Sonoran pronghorn falls within the Lower Sonoran Desert Life Zone (Shreve and Wiggins, 1964). There are several major subdivisions within this life zone of which the two northernmost occur in southern Arizona. These are the Arizona Upland Desert which is basically a Paloverde-Saguaro Association and the Lower Colorado Desert which is primarily a Creosotebush-Bursage Association.

The Paloverde-Saguaro Association is comprised of small-leaved trees, sclerophyllous shrubs and numerous cacti. The best development of this association is found on rocky hills, bajadas and other coarse-soiled slopes typical of the major mountain ranges of southwestern Arizona. Primary desert trees are foothill paloverde (Cercidium microphyllum), ironwood (Olneya tesota), mesquite (Prosopis juliflora), catclaw (Acacia gregii), crucifixion thorn (Holocantha emoryii) and smoketree (Dalea spinosa). The major cacti are saguaro (Carnegia gigantea) and barrel (Ferocactus wislizeni). One of two shrubs, triangle-leaf bursage (Ambrosia deltoidea) or brittle bush (Encelia farinosa) is almost always present in the understory as are many annual and perennial forbs and grasses.

The Creosotebush-Bursage Association is composed mainly of shrubs. The plant dominants are creosote bush (Larrea tridentata) and bursage (Ambrosia dumosa). Trees are usually lacking except for those found

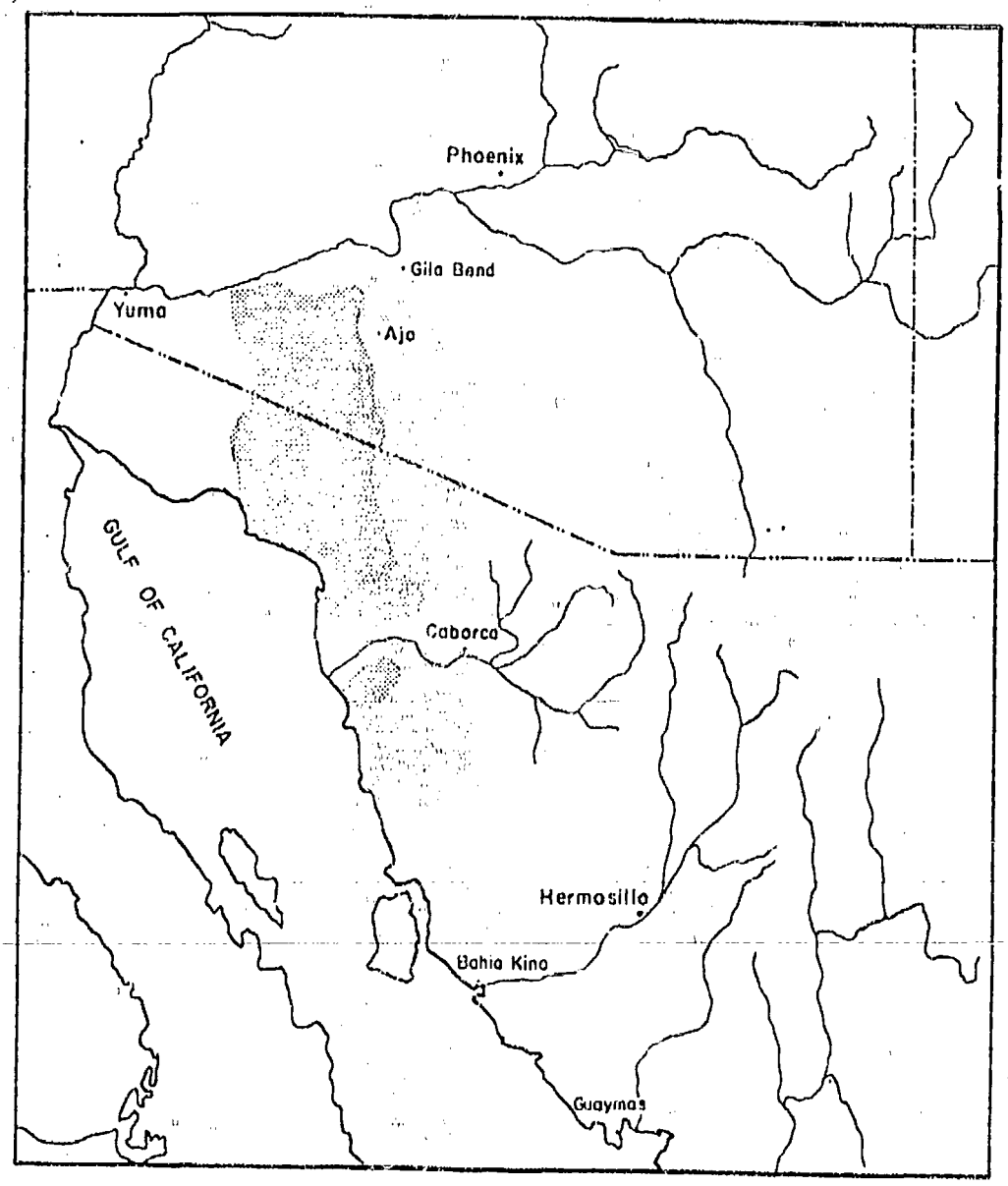

Fig. 2. Present distribution of Sonoran pronghorn antelope in Mexico and Arizona. (Arizona Game and Fish Department, 1979).

in the desert riparian drainageways. This shrub community characterizes less rocky areas of lower relief such as the extensive valleys between the mountain ranges.

The Sonoran pronghorn is a hardy animal which is able to survive in habitats where few other large ungulates are found. The flat, sandy desert offers little protection from the excessive summer heat and provides little free water under today's conditions. Food plants are scarce throughout most of the pronghorn's habitat and rainfall is scanty and sporadic.

C. Population Numbers

Nelson (1925) estimated a Sonoran pronghorn population of 595 in Sonora and 105 in Arizona. Nichol (1941) estimated 60 antelope in southwestern Arizona not including those found on the Organ Pipe Cactus National Monument. Halloran (1957) said there were probably less than 100 Sonoran pronghorn in 1956. Since then, Villa (1958) estimated over 1,000 antelope in northwestern Sonora in 1957. The latest population estimate for Sonoran pronghorn in Arizona is 50 (Monson, 1968). Observations compiled by personnel of the Arizona Game and Fish Department over the past 10 years indicate a population in Arizona of more than 50 but probably less than 150. The population in Mexico is believed to number between 200-350 (Arizona Game and Fish Department 1981).

D. Habitat Characteristics

1. Physiography:

The present Sonoran pronghorn range in southwestern Arizona is characterized by broad alluvial valleys separated by block-faulted mountains. The mountains are of two major types: a sierra type composed of metamorphic and granitic rock, and a mesa type, usually of basaltic composition. Only the Ajo Mountains exceed 3,000 feet in elevation. Mean elevations of the valleys vary from 400 feet to 1,600 feet above sea level. The mountain ranges generally run in a northwest-southeast direction with major valleys draining to the north or south.

2. Climate:

Sonoran pronghorn habitat falls under the southwestern or Arizona climatic pattern (Sellers and Hill, 1974) which is characterized by winter rains, spring drought, summer rains and fall drought. Almost one-half of the normal yearly precipitation (3-15) inches falls from July-September. This precipitation, usually in the form of intense, localized thunderstorms, is associated with deep currents of moisture moving across southern Arizona from the Gulf of Mexico. A precipitation maximum occurs during the winter when storms from the Pacific Ocean

sweep across southern Arizona via southern California. These storms usually produce the heaviest, most widespread and effective precipitation.

Heat and aridity are dominant climatic characteristics of Sonoran pronghorn habitat. During the hottest part of the year (July-August) daily maximums exceed 110° F. and temperatures of 120° are not uncommon. The cooler winter months find daytime temperatures reaching the middle sixties or seventies and nighttime temperatures remaining above freezing.

E. Reasons for Population Decline

Several reasons have been presented for the decline of the Sonoran pronghorn. The most popular is overhunting. Unregulated hunting undoubtedly contributed to the initial decline; however, with the protection that has existed for the past 40 years the pronghorn should have recovered if hunting was indeed the primary factor. The probable reason for the decline is loss of habitat. The drying of major rivers and overgrazing significantly altered Sonoran pronghorn habitat in southwestern Arizona by the 1930's. This habitat has yet to recover despite the fact hat most of the area is made up of three large public land withdrawals (Cabeza Prieta Game Range, Organ Pipe Cactus National Monument, and Luke-Williams Gunnery Range).

The only significant loss of habitat in recent years in Arizona occurred on the Pagago Indian Reservation where severe overgrazing by cattle coupled with recurrent drought resulted in the loss of large areas of pronghorn habitat. It is believed that economic exploitation of habitat (grazing, agriculture) and poaching are still causing numerical and habitat losses in Mexico.

II. RECOVERY

A. Objective: Maintain existing population numbers and distribution of Sonoran pronghorn while developing techniques which will result in a U.S. population of 300 animals (average for a five-year period) or numbers determined feasible for the habitat.

When this population figure has been met and it is believed by the Fish and Wildlife Service that major threats have been eliminated, the subspecies may be considered for delisting.

The two major problems facing recovery of the Sonoran pronghorn are:

(1) Recovery methods employed in Mexico may have to be quite different than those used in Arizona.

In the United States most of the habitat where Sonoran pronghorn are found is reasonably secure, controlled by either the National Park Service, the U.S. Fish and Wildlife Service or the Department of Defense. However, in Mexico the habitat occupied by the pronghorn is rapidly deteriorating due to economic exploitation. In addition, poaching, a limiting factor in Mexico is not known to occur in Arizona.

It is obvious that a comprehensive plan must be developed and implemented by Mexico if the species is to be completely delisted.

(2) Present knowledge presents no clear means to increase either population densities or range. While range extension through habitat management and/or transplanting may offer potential as a means of increasing the population, no data exist describing suitable transplant sites, capture methods or the number of animals that could be removed safely from the existing population. Pursuing any course of action without adequate information could result in long term detrimental effects on the existing population.

B. Step-down Outline

Prime objective: Maintain existing population numbers and distribution of Sonoran pronghorn while developing techniques which will result in a U.S. population of 300 animals (average for a five-year period) or numbers determined feasible for the habitat.

1. Maintain present population

11. Monitor U.S. population

111. Actively survey population

112. Standardize reporting of sightings

113. Develop improved monitoring techniques

12. Assist Mexico in monitoring the Mexican population

13. Protect and manage known antelope habitat

131. Maximize public ownership of essential habitat

132. Enhance law enforcement efforts aimed at protection

133. Preserve existing habitat

1331. Prevent livestock trespass

1332. Minimize human disturbance

1333. Assure Section 7 consultation is done on federal projects which could impact the antelope

14. Determine taxonomic status

141. Review existing specimens

142. Preserve additional material

2. Increase existing population

21. Determine life history

211. Determine individual and population movement, distribution and mortality

2111. Mark or capture and fit animals with radio collars

21111. Refine marking techniques if necessary

21112. Refine radio-collaring techniques if necessary

2112. Monitor movements of marked animals

212. Determine natality

213. Investigate inter- and intra-specific competition

214. Ascertain biological parameters

2141. Determine population parameters

2142. Determine habitat requirements

21421. Food

21422. Water

21423. Space

21424. Shelter

22. Increase population within existing habitat to numbers determined feasible

221. Modify limiting factors as identified in 21 if warranted

2211. Predator control

2212. Increase food supply

2213. Increase available water

2214. Reduce effect of disease and parasites

2215. Minimize human disturbance if warranted

22151. Modify fencing

22152. Control access

22153. Control poaching

22154. Reduce harrassment

22155. Contain development

22156. Discourage increased human use

2216. Eliminate permit and trespass livestock grazing

222. Establish captive breeding population to provide transplant stock

23. Reestablish in historic habitat

231. Make site selections in historic range

2311. Determine historic range

2312. Determine suitable areas

2313. Obtain necessary permission for transplants from land holding agencies or private sector

232. Investigate legal aspects of reintroductions

233. Conduct an I & E program in proposed transplant areas

234. Improve habitat at relocation sites

2341. Predator suppression

2342. Fence modification

2343. Food and water

235. Develop techniques for transplanting

2351. Capture techniques

2352. Holding techniques

2353. Transportation techniques

2354. Release techniques

236. Determine criteria for selection of animals

2361. Age composition

2362. Sex ratio

2363. Herd size

237. Monitor transplanted populations

2371. Monitor habitat

2372. Monitor population

C. Narrative

Primary Objective and Rationale:

1. Maintain the number and distribution of Sonoran pronghorn in the United States and Mexico.

11. Continuously compile data relating to numbers and distribution of existing U.S. population.

111. Actively survey population

Conduct annual census by helicopter.

112. Standardize reporting of observations

The refuge manager of the Cabeza Prieta National Wildlife Refuge should be responsible for compiling an annual report of all known observations. Data reported should include time, location and number of animals as a minimum with other information to be included as available.

113. Develop improved monitoring techniques

Techniques should be evolved as knowledge of the animals is gained.

12. Provide assistance to the Mexican government in establishing and implementing a sound management plan for the Sonoran pronghorn in Mexico.

Recovery of the Mexican portion of the Sonoran pronghorn population must include the solution to several major problems which are not at issue in Arizona. Poaching exists and will continue in the absence of effective law enforcement. Sonoran pronghorn habitat in Mexico is presently subjected to uncontrolled grazing and agricultural development. Continuing agrarian reform relocation projects (ejidos) result in increased human habitation within Sonoran pronghorn habitat, thereby compounding the preceding problems.

Any plan conceived to effect the recovery of the Sonoran pronghorn populations in Mexico will have to be drafted by Mexican biologists in order to have their acceptance and to reflect their operational constraints.

13. Protect and Manage Existing Pronghorn Habitat

131. Maximize public ownership of essential habitat

Identify essential habitat and determine the most feasible methods of protecting areas in private ownership that are necessary for the continued existence of of the Sonoran pronghorn.

132. Enhance law enforcement efforts aimed at protection

Present enforcement personnel, both Federal and State, are spread too thin to adequately prevent or detect violations of the Endangered Species Act.

133. Preserve quality of existing habitat

1331. Prevent livestock trespass

This action will be accomplished through fence maintenance, retirement of existing grazing leases and prosecution of violators.

1332. Minimize Human Disturbance

Vehicle traffic within essential habitat will be miminized and restricted to existing roads only. Exceptions will be tolerated only in emergencies.

1333. Assure Section 7 consultation is done on Federal projects which would impact the Sonoran pronghorns

All Federal agencies which authorize, fund or carryout activities on lands occupied by the Sonoran pronghorn must be made aware of their legal responsibilities.

14. Determine taxonomic status

141. Review existing specimens

Catalogue and examine reference material.

142. Preserve additional material

Insure deposition of new materials in a designated collection.

2. Increase existing population

21. Determine life history

A life history study is necessary to establish criteria required for increasing population numbers or range expansion.

211. Determine individual and population movement, distribution and mortality

2111. Mark or capture and radio collar pronghorns

21111. Refine capture techniques if necessary

Since most capture techniques result in the death of a small percentage of individuals, and because this population is extremely small to begin with, it is imperative that capture loss be reduced to zero if at all possible.

21112. Refine radio collaring techniques if necessary

2112. Monitor movements of radio-collared animals

Monitoring and capturing may require extensive use of fixed-wing aircraft and helicopter time.

212. Determine natality

Fawning success should be determined annually.

213. Investigate inter- and intra-specific competition

Harshness of environment results in a scarcity of vital resources limiting the number of individuals which can survive. Short-term increases to numbers exceeding carrying capacity could result in a long-term decrease in population size. Bighorn sheep, mule deer and Sonoran pronghorn are the ungulates present in the habitat. Livestock interactions may also require investigation.

214. Ascertain biological parameters

A five-year study involving several biologists with strong ecological backgrounds, and a radio telemetry program will be necessary to determine these parameters.

2141. Determine population parameters

Census and observational data will be compiled to determine sex and age composition, fawn survival, and herd sizes.

2142. Determine habitat requirements

Basic food, water, shelter and spatial requirements of the Sonoran pronghorn are unknown at present. This information is necessary to make intelligent decisions relative to habitat management and selection of transplant sites.

22. Increase population in existing habitat to 300 animals or numbers determined feasible by step 214.

This objective, if reached, would meet the criteria for downlisting the population and transplanting would not be necessary.

221. Modify limiting factors as identified in step 21

If life history investigations identify any factors as limiting to the population, an effort will be made to eliminate or modify these factors.

2211. Predator Control

At present there is no evidence that predation has or has not adversely affected the population. However, no effort has been made to determine this in a scientific manner.

2212. Increase food supply

Adequate habitat manipulation techniques presently exist to increase food supply should the above studies determine it to be necessary.

2213. Increase available water

Several catchments and wells have been constructed by the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service, but a monitoring program is needed to determine their value to pronghorn before others are constructed.

2214. Reduce effect of disease and parasites

2215. Minimize human disturbance

Human disturbance can be significantly reduced on public land by the following measures if deemed necessary.

22151. Modify fencing

22152. Control access

22153. Control poaching

22154. Reduce harassment

22155. Contain development

22156. Discourage increased human use

222. Establish captive breeding population to provide transplant stock.

Captive breeding may enhance production and increase the number of animals available for transplant.

23. Reestablish in historic habitat

Reintroduction into historic habitat may be the only realistic way to reach the population goal of 300 individuals.

231. Make site selection in historic range

2311. Determine historic range

2312. Determine suitable areas

2313. Obtain necessary permission for transplant from land holding agencies or private sector

No transplant will be considered if the cooperation of the landowner and involved State and Federal agencies cannot be secured.

232. Investigate legal aspects of reintroductions

All agencies or landowners involved in a transplant effort will be made aware of their legal responsibilities.

233. Conduct I & E program in proposed transplant areas to gain public support.

234. Improve habitat at relocation sites if necessary to insure a successful transplant.

The expense and effort involved in relocation attempts will require that the relocation site be upgraded by the following means if necessary.

2341. Predator suppression

2342. Fence modification

2343. Food and water development

235. Develop techniques for transplanting

The holding, transplant and release methods presently used for A. a. americana may not be suitable for A. a. sonoriensis.

236. Determine criteria for selection of animals

Ascertain proper sex and age composition and herd size for a transplant effort.

237. Monitor transplanted populations

2371. Monitor habitat

The ecosystem must be monitored to insure that the introduction of the pronghorns does not seriously impact the habitat and that there are no ecological changes that may jeopardize the success of the transplant. Although not anticipated,

dramatic ecological changes may call for the removal of the pronghorns and a reevaluation of the transplant program.

2372. Monitor population

Utilizing radio collars, marked animals, aerial observations, etc., monitor population and individual behavior and movement for a 3-year period.

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