Plan for Translocation of Northern Ocelots (*Leopardus pardalis albescens*) in Texas and Tamaulipas

Prepared by the Translocation Team,
A Subcommittee of the Ocelot Recovery Team
May 2009

EXECUTIVE SUMMARY

The ocelot (*Leopardus pardalis*) is listed by the U.S. Fish and Wildlife Service (USFWS) as endangered throughout its range in the western hemisphere, where it is distributed from southern Texas through Central and South America into northern Argentina and Uruguay. Two subspecies once occurred in the U.S. The Sonoran ocelot (*L. p. sonoriensis*) once ranged from Sonora, Mexico, north through southeastern Arizona, but has not been documented in Arizona since the 1960s. The Northern ocelot (*L. p. albescens*) once ranged from northern Coahuila, Mexico, north through Tamaulipas, Nuevo León, Texas, and portions of Arkansas and Louisiana, but its range has diminished dramatically. Currently the known U.S. population has fewer than 50 ocelots of the subspecies *L. p. albescens* in two separated populations in southern Texas. A third and much larger population of *L. p. albescens* occurs in Tamaulipas, Mexico, but is geographically isolated from ocelots in Texas. This plan focuses on the subspecies *L. p. albescens*.

The Ocelot Translocation Team was formed by the USFWS as a subcommittee to the Ocelot Recovery Team in 2008 and is a binational effort to implement a translocation recovery strategy. The following organizations are involved with this binational effort:

Comisión Nacional de Áreas Naturales Protegidas
Dirección General de Vida Silvestre
Comisión Nacional para la Biodiversidad
Dallas Zoo
Environmental Defense Fund
Gladys Porter Zoo
Instituto Tecnológico de Ciudad Victoria
Tamatán Zoo, Ciudad Victoria
Texas A&M University-Kingsville, Caesar Kleberg Wildlife Research Institute
Texas Parks and Wildlife Department
The Nature Conservancy
U.S. Fish and Wildlife Service

Ocelots in Texas and Tamaulipas face multiple challenges. Habitat conversion, fragmentation, and loss comprise the primary threats to the ocelot today throughout its range. Human population growth and development continue in both Texas and Tamaulipas, creating and widening gaps between once-contiguous ocelot populations. Ocelots attempting to move between remaining habitat fragments are faced with open areas, fences, roads, and other barriers. Collision with vehicles is a leading cause of ocelot mortality in

Texas, contributing to reduced numbers and population isolation. Small population size and isolation from conspecifics in Mexico have resulted in severely reduced genetic diversity in the Texas population, which can lead to lower reproductive and survival rates, reduced disease resistance, and increased susceptibility to stochastic events. As a result of these cumulative factors, ocelots are at high risk of extinction in the U.S.

The USFWS's Ocelot Recovery Team has identified the following strategies as important for recovery of ocelots in Texas and Tamaulipas:

- the assessment, protection, reconnection and restoration of sufficient habitat to support viable populations of the ocelot in the borderlands of the U.S. and Mexico;
- the reduction of effects of human population growth and development on ocelot survival and mortality;
- the maintenance or improvement of genetic fitness, demographic conditions, and health of the ocelot;
- the assurance of long-term viability of ocelot conservation through partnerships;
- the development and application of incentives for landowners, application of existing regulations, and public education and outreach;
- the use of adaptive management, in which recovery is monitored and recovery tasks are revised by the USFWS in coordination with the Recovery Team as new information becomes available; and
- the support of international efforts to ascertain the status of and conserve the ocelot in Tamaulipas and Sonora.

The goal of the translocation effort is to help assure long-term viability of Texas and Tamaulipas ocelot populations. Modeling has revealed a high probability of extinction for ocelots in Texas and demonstrated that translocation can greatly reduce that probability in the short term. Translocating ocelots from Mexico will improve demographics and genetic diversity of the Texas population and decrease the probability of immediate extinction while long-term conservation actions such as road crossings and habitat restoration are undertaken. Populations in Mexico will benefit from increased information on distribution, abundance, and disease profiles. Additionally, protocols from this plan could be used to repopulate formerly occupied areas in Mexico by moving ocelots from existing populations.

Both Mexico and the U.S. will benefit from this bi-national translocation effort. Mexico benefits by learning more about the distribution and number of ocelots in Tamaulipas, having several individuals with a variety of agencies directly employed or engaged in the effort, obtaining a disease profile for Tamaulipas ocelots, and establishing closer ties and relationships with conservation organizations and agencies in the U.S. Other potential benefits include workshops for exchange of information and training in field techniques and cross-border sharing of research equipment and resources. The U.S. benefits by having several individuals with various agencies directly employed or engaged in the effort, demographically and genetically augmenting ocelots in Texas thereby reducing the risk of extinction, and establishing closer ties and relationships with conservation organizations and agencies in Mexico.

I. INTRODUCTION

A. USING TRANSLOCATION AS A TOOL FOR OCELOT RECOVERY

The northern ocelot subspecies (*Leopardus pardalis albescens*) historically occupied much of southern, central, and eastern Texas and northeastern Mexico. Currently, fewer than 50 ocelots are thought to remain in southern Texas. These represent the only known breeding populations in the U.S. Ocelots occur primarily in two small isolated populations - one in eastern Cameron County with a core centered on Laguna Atascosa National Wildlife Refuge (LANWR) (called the Cameron population) and the other in and around northern Willacy County with a core centered on the Lower Rio Grande Valley National Wildlife Refuge's permanent conservation easements within the Yturria Ranch (called the Willacy population). These two small populations each support fewer than 30 individuals and are highly vulnerable to extinction due to their isolation from each other and ocelots in Mexico.

Genetic erosion has been documented in both Texas populations over the past century (Janečka 2006), and they currently have critically small effective population sizes (Janečka et al. 2008). The population in Tamaulipas has much higher genetic diversity (Walker 1997, Janečka 2006, Janečka et al. 2007), suggesting that it is considerably larger than those in Texas. Ocelots in Tamaulipas are genetically similar to those in Texas, are of the same subspecies, and occupy the same biotic province, making them suitable as source animals for translocation efforts (Janečka et al. 2007).

Translocation is defined by the IUCN/SSC Re-introduction Specialist Group as "deliberate and mediated movement of wild individuals or populations from one part of their range to another" (IUCN 1995). The USFWS's Ocelot Recovery Team recognizes the need for ocelot translocation as a tool to reduce some of the problems threatening ocelot survival within Texas. In addition, computer modeling shows the benefits of translocation by reducing the likelihood of extinction in the immediate future (Haines et al. 2006). Translocation will provide time to implement additional recovery actions to alleviate current threats to the species within Texas. Additional recovery actions may include but are not limited to habitat acquisition and restoration and installation of wildlife road crossings to reduce road mortality.

Consequently, we propose to use translocation as a strategy to improve the population demographics and genetic variability of the ocelots in Texas. Early translocations will augment existing ocelot demographics with secondary benefits of increasing genetic variation, thereby promoting healthier populations in Texas that are more resilient. Early translocation efforts will also enable the translocation team to develop a protocol that could also be used to reintroduce ocelots to currently unoccupied habitat in Mexico and Texas.

B. OBJECTIVES

The following objectives and criteria are specific to the effort of translocating ocelots from Mexico to Texas, but also achieve other recovery objectives outlined by the USFWS's Ocelot Recovery Team.

1) Ensure no adverse impacts to source populations in Mexico result from translocation.

Evaluation:

a) Evaluate and identify source population prior to translocation.
b) Estimate distribution and population size in Tamaulipas prior to translocation.
c) Monitor population demographics in Mexico after translocation.

2) Improve demographics and genetic variability of existing ocelot populations in Texas.

Evaluation:

a) Confirm integration of one or more translocated ocelots into the existing population.
b) Confirm successful reproduction of translocated ocelots.
c) Monitor changes in genetic diversity.

3) Reduce the probability of extinction in existing Texas populations so that longer-term recovery actions can be implemented.

Evaluation:

a) Translocate 4 ocelots/event every 1-3 years over a 20-year period with integration of at least 2 animals/event to meet recommendations based on current population viability analysis (PVA) modeling (C. Stasey, unpublished data).

4) Strengthen collaborative conservation and environmental education efforts between Mexico and the U.S.

Evaluation:

a) Establish working relationships between the zoos, academic institutions, non-governmental organizations, and Federal and State agencies.
b) Establish a methodology for translocation that can be utilized bi-nationally through development of a translocation protocol in collaboration with Mexico.
c) Create a bilingual website promoting education and public awareness of conservation and recovery actions for ocelots.

5) Create new populations of ocelots in Texas to prevent extinction due to catastrophic events.

Evaluation:

a) Establish one or two new stable populations within 20-30 years.

II. METHODS

A. IDENTIFICATION AND ASSESSMENT OF SUITABLE SOURCE POPULATIONS

Two important goals are relevant to any potential source population that would be used for the translocation of ocelots from Mexico into Texas. The first goal is to define source populations in Mexico that have adequate size and genetic diversity to provide suitable individuals for translocation. The second goal is to maintain the security of the source population by monitoring for and avoiding detrimental population impacts related to removal of individuals.

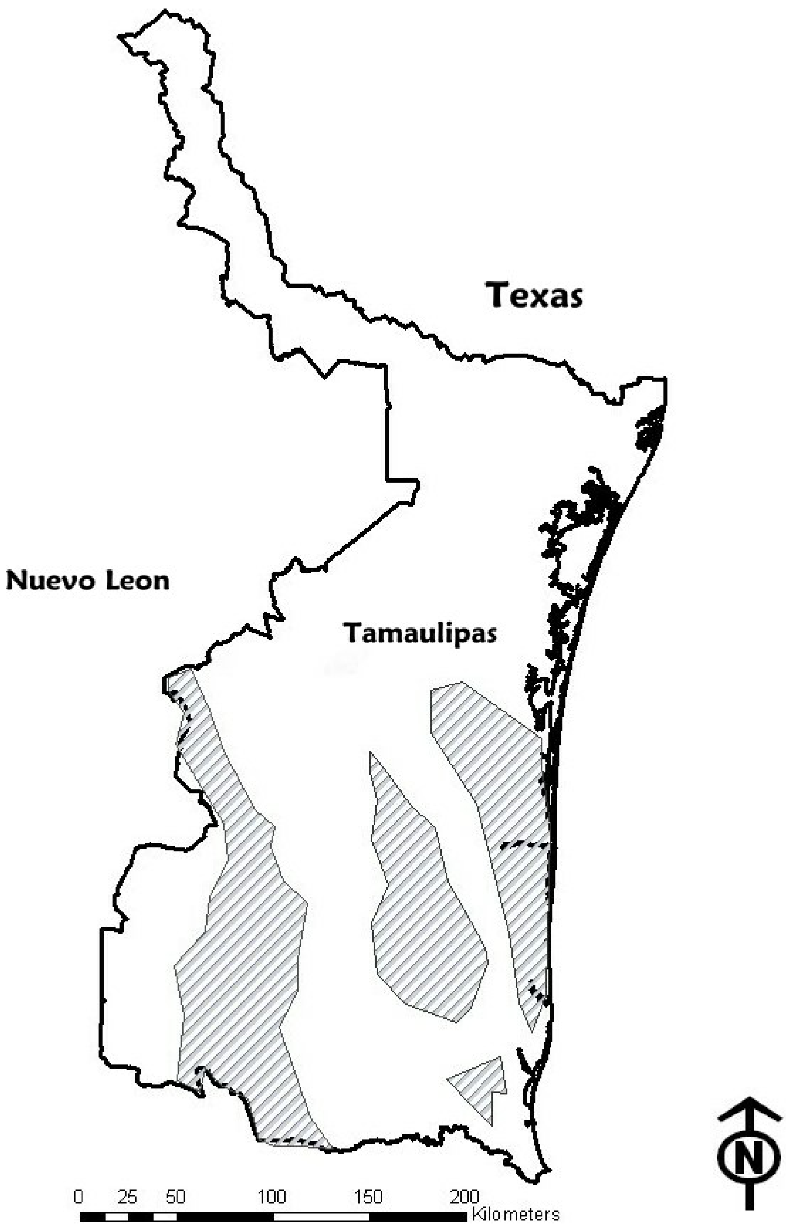
To achieve these two goals, we will employ the following approaches: (1) identify the location and size of potential source populations, (2) select a suitable source population, (3) develop population and habitat models to predict safe levels and potential consequences of ocelot removals, and (4) monitor the source population before and after removal of ocelots to assess possible impacts from translocation. These activities will also increase available knowledge and information regarding the distribution and status of ocelots within Tamaulipas.

1. Identifying the Source Population

Janečka et al. (2007) developed a molecular phylogeny from mtDNA sequences to evaluate the most appropriate source populations for translocations and to determine the phylogenetic position of ocelots from northern Mexico and southern Texas. Historically, the ocelot has been divided into 10 subspecies (Murray and Gardner 1997), however, the range of the recognized subspecies does not generally coincide with the mtDNA phylogeny (Eizirik et al. 1998). Nevertheless, there is evidence for two major geographical units, one in southern Texas, Mexico, and northern Central America, and the other in southern Central America and South America. Each major group shows some internal division or structure. The ocelot populations in Texas are most similar to those in northern Mexico, identifying a biological unit within the Tamaulipan Biotic Province and within the range of *L. p. albescens* (Janečka et al. 2007).

Ocelot populations in the Tamaulipan Biotic Province were a part of a more widespread population that previously encompassed the range of *L. p. albescens* and included northern Mexico. Because the two populations in southern Texas were once a part of this broader population, and the populations in Texas and northern Mexico are genetically similar, regions in northern Mexico (Figure 1) are the most appropriate source for translocations. Ocelots in northern Mexico display higher genetic variability than those in Texas (Walker 1997, Janečka 2006, Janečka et al. 2007), indicating that the Tamaulipas population is genetically healthy enough to serve as a source population.

Figure 1. Currently known ocelot (*Leopardus pardalis albescens*) distribution in Tamaulipas, Mexico (A. Caso unpubl. data).



2. Determine Possible Effects on the Population

We will evaluate the potential effects that removal of ocelots for translocation can have on the source population. This assessment will use several different approaches, including population modeling, habitat mapping, and field surveys, to ensure a detrimental effect does not occur to the ocelot population in Mexico.

a. Population Modeling

We will use the VORTEX program to evaluate the potential effect that removal of ocelots from Mexico could have on source population persistence and to predict safe levels of ocelot removals (Lacy et al. 2003). Information from past and recent field surveys and habitat mapping will be incorporated into the model. Following procedures developed by Haines et al. (2006) each scenario will be simulated 1,000 times to estimate extinction risk and average population size projected in a 50-year time horizon. This modeling will provide information about the optimum number of translocations and the threshold or capacity of the Mexico population for providing ocelots without harm to the source population. In addition, demographic and spatial considerations will be evaluated with the programs RAMAS/GIS version 4.0 and Spatial Data (Akçakaya 2002), respectively, following procedures developed by Haines et al. (2006). A sustainable level of ocelot removal for translocation from the Sierra Tamaulipas population will be determined.

Past studies of the effects of removal rates on other cat species (e.g., bobcat, mountain lion) will serve as another approach to assessing source population impacts. Knick (1990) developed a population model that explored the effect of different harvest levels on bobcat home range vacancies. Also, the application of harvest scenarios for mountain lion and a recent mountain lion PVA based on southern Texas will be assessed and compared to the ocelot situation (Young 2009).

b. Habitat Mapping

For initial calculations of habitat availability we will use vegetation maps produced by the Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO) to estimate ocelot habitat in the northern Sierra Tamaulipas. Because we have detected ocelot presence within thorny thicket (matorral espinosa), low deciduous forest (selva baja caducifolia y subcaducifolia), and low perennial thorny forest (selva baja perennifolia sub perennifolia y espinosa) classifications, these will serve as our categories for classification and for estimation of available habitat.

Further refinement of suitable habitat will be accomplished by classification of percent canopy coverage using Landsat photographs and digital ortho-quadrangles (DOQ) (if available) in ARCMap 9.3 (ESRI, Redlands, CA). Previous research in Texas has indicated that ocelot habitat is characterized by >95% canopy coverage with marginal use of 75-95% canopy coverage, and avoidance of <75% canopy coverage (Harveson et al. 2004, Horne et al. 2009). Telemetry tracking of radio-collared ocelots will confirm the use of specific imagery classifications, from which we can extrapolate habitat values throughout the image cover. Site verifications of classification categories will be required to confirm the identity of each cover category.

The habitat evaluation will provide an estimate of the amount of potential habitat available in the Sierra Tamaulipas. Different levels of ocelot density from previous research (Caso 1994, Haines et al. 2005) will be projected over the available habitat in order to provide estimates of population size and potential to provide source ocelots.

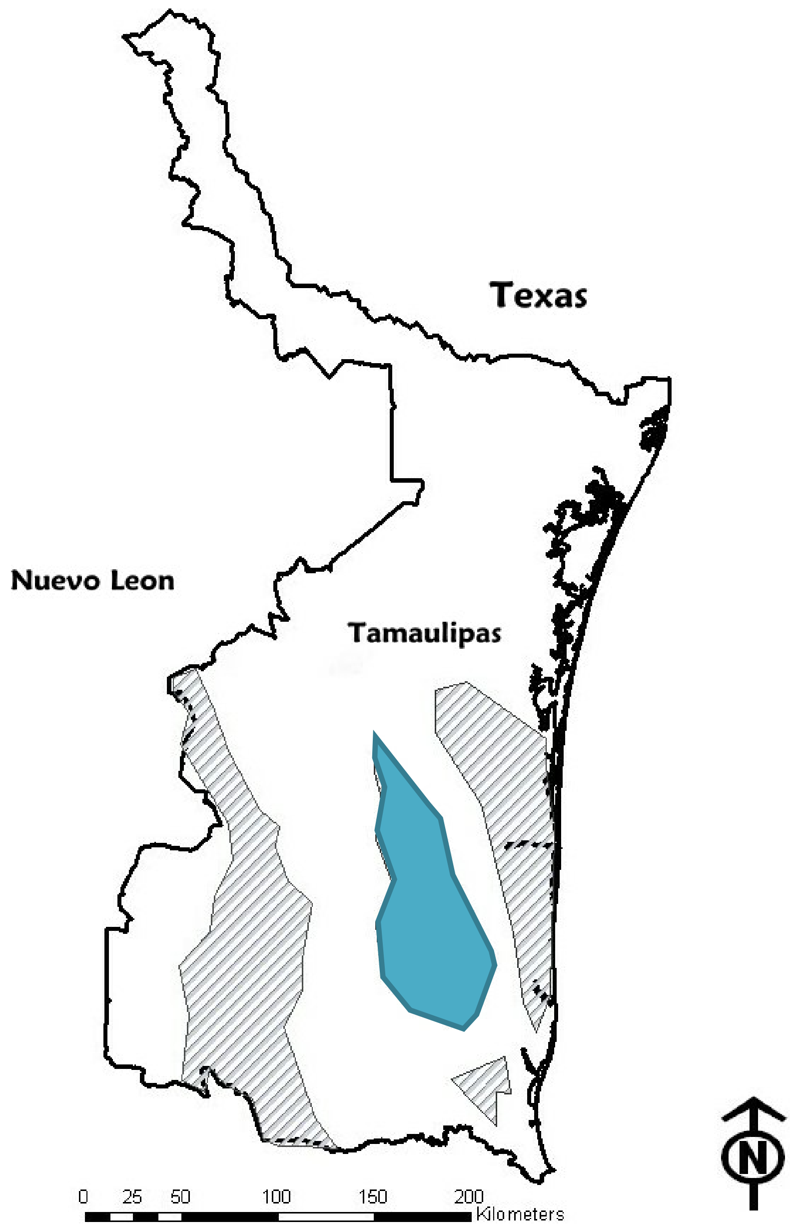
c. Field Surveys

Based on past research (Janečka et al. 2007), a suitable source population is believed to exist in the Sierra Tamaulipas region of northeast Mexico (Figure 2). A few individual ranches have been preliminarily surveyed and the presence of ocelots has been documented. The preliminary survey will be expanded in scope and duration to identify presence/absence and to assess distribution in the Sierra Tamaulipas. At a subset of sites where ocelots are present, camera trapping and radio telemetry will be used with mark-recapture analysis to obtain density estimates for the source population. Density estimates will be extrapolated over the occupied area to obtain a population estimate and confirm suitability of the population as a source for translocation. Standard procedures for camera trapping and box trapping already developed and implemented for ocelots will be the primary methods used to assess their distribution and abundance in the source population (Dillon and Kelly 2007).

Ocelots in the source population will also be monitored with radio-telemetry before and after translocation to determine how well vacancies created by removal of animals are filled and whether there is a population-level effect. These capture and telemetry techniques should also provide a group of identified individuals with known information about age, sex, and health, thus allowing for optimal selection of individual ocelots that will have the best chance for successful translocation.

Biologists will attempt to obtain blood samples from captured ocelots. This action will allow testing for health indices, diseases, and genetic variability, thus providing information on diseases present in the population as well as the health status of individual translocation candidates. Diseases that will be evaluated may include FeLV, FIV, calicivirus, rhinotracheitis, parvovirus, Panleukopenia, heartworm disease, bloodborne parasites, leptospirosis, histoplasmosis, coccidiomycosis, and canine distemper, to provide a disease profile of the source population. If blood cannot be obtained upon capture, then health screening of translocation candidates will be conducted once the ocelot is brought into captivity.

Figure 2. Area within the Sierra Tamaulipas identified as a suitable potential source population for ocelot translocation efforts in Texas and Mexico (A. Caso unpublished data).



B. IDENTIFICATION AND MONITORING OF SUITABLE RELEASE SITES FOR THE EXISTING TEXAS POPULATION

The objective of translocating animals into existing populations is to improve population demographics, increase genetic variability, and reduce the probability of population extinction. This is particularly important for the two relict ocelot populations in Texas in order to reduce their risk of extinction. Although isolated populations have not yet been identified in Mexico, the methodologies for this project may be applied in Mexico in areas where current vacancies exist.

Population viability analysis indicates that to reduce the probability of extinction in Texas, at least 4 ocelots should be translocated every 1-3 years for a 20-year period with successful integration of at least 50% of the individuals moved (C. Stasey, unpublished data). Multiple release sites therefore need to be selected within each relict population. For each translocation event we will: (1) identify the locations of potential release sites, (2) select release sites based on criteria specific to each population, and (3) monitor release sites before and after ocelot releases to assess possible benefits and impacts from translocation. Several factors must be considered in identifying locations of potential release sites. To be successful, translocated ocelots will need to become fully integrated into existing populations, successfully reproduce, and contribute to the gene pool. Therefore proximity to existing populations and areas currently occupied by ocelots is extremely important. Adequate amounts of high quality habitat must be available to support released ocelots year-round. History of ocelot use should also be considered because past use suggests a site is more likely to be suitable. Finally, because incidental collision with motorized vehicles is a leading cause of ocelot mortality (Haines et al. 2005a), proximity of potential release sites to roads with high-speed and/or high-volume traffic must also be considered.

In general the following criteria should be considered when selecting a site for translocation:

- Release sites should be within or adjacent to existing populations in order to maximize the probability of successful integration of released ocelots. However, for any proposed release sites not within or adjacent to existing populations, GIS mapping will be used to determine proximity and potential connectivity of these sites to areas occupied by ocelots.
- The minimum amount of habitat that has been used for extended lengths of time by ocelots is 65 acres (unpublished data); therefore 65 acres of high quality habitat is the minimum patch size that will be considered for a release site. GIS mapping will be used to determine if potential release sites meet this minimum patch size criterion.
- Areas that are known to have supported ocelots in the past for extended lengths of time (a minimum of one continuous year), but are currently vacant, are more likely to have adequate habitat and prey base, and will be prioritized as suitable release sites.
- Incidental collision with motorized vehicles is a leading cause of mortality for ocelots in the Cameron County population (Haines et al. 2005a). Therefore, release sites will be chosen to avoid roads with high-speed and/or

high-volume traffic when possible. It is possible that a translocated ocelot may at some point move into a high-risk location, and protocols to address this possibility are in Appendix 1.

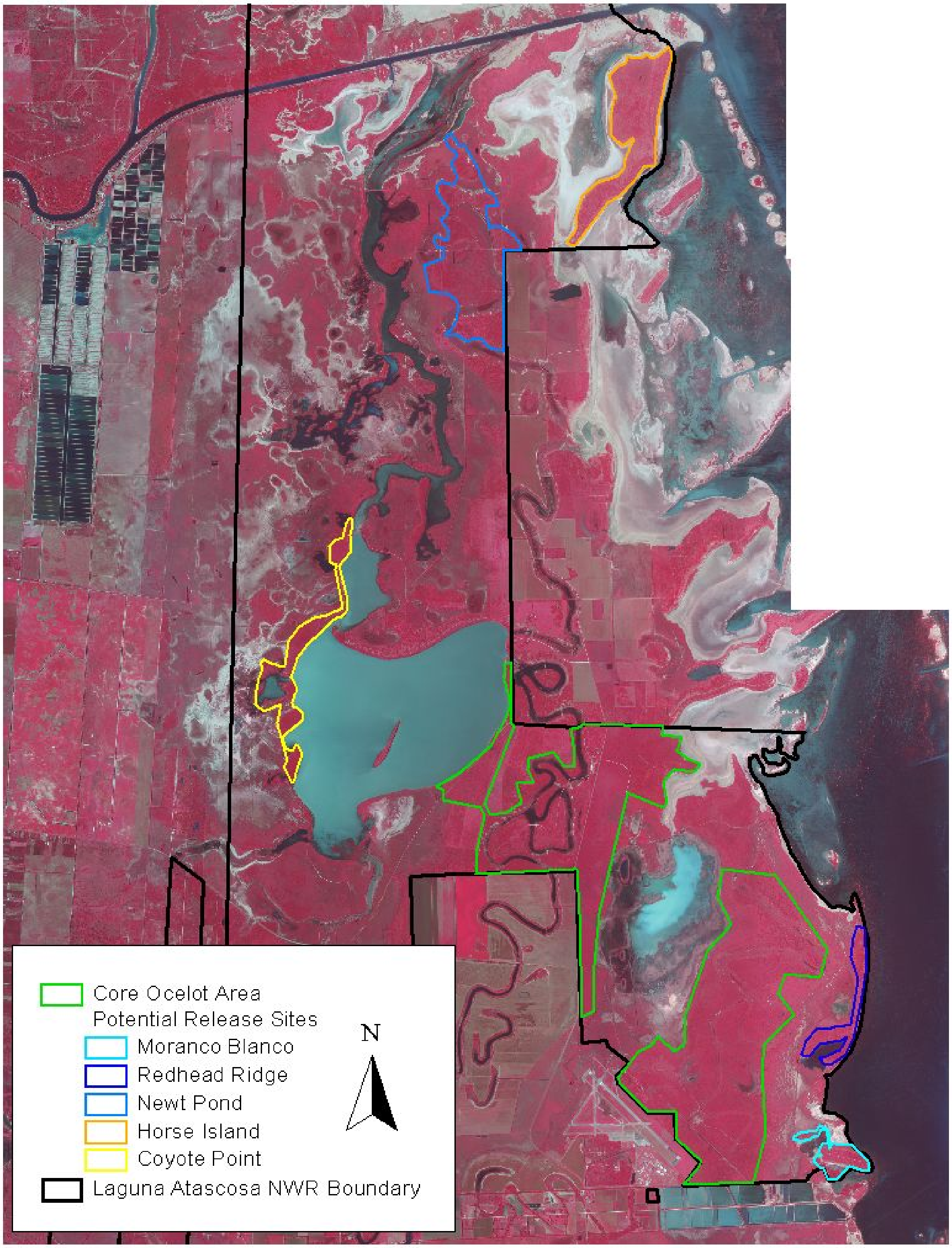
Monitoring and research has been conducted annually on the Cameron County population, primarily at LANWR, since 1982 (Tewes and Everett 1982) and intermittently on the Willacy County population since 1984 (Rappole 1984). Data relevant to the identification of potential release site locations includes long-term patterns of ocelot use of specific sites and territories (USFWS unpublished data), cumulative information on territory sizes and distributions (Tewes 1986, Laack 1991, Caso 1994, Jackson et al. 2005, USFWS unpublished data), amounts and spatial distributions of high quality habitats (Anderson et al. 1997, Horne 1998, Harveson et al. 2004, Haines et al. 2005b, Jackson et al. 2005), and cumulative data on road mortality locations (Haines et al. 2005a, USFWS unpubl. data). Results of these studies indicate that population dynamics, territorial mechanisms, and amount of high quality habitat differ between the Cameron and Willacy populations. Because the Cameron and Willacy populations in Texas vary from each other in a number of significant ways, criteria for selection of release sites may differ between localities as indicated in the following sections.

1. Release Site Criteria for the Cameron County (LANWR) Population

Twenty-five years of radio-monitoring within LANWR has shown that there is a core area that is almost always occupied by ocelots (Figure 3), as well as a periphery area surrounding the core that is intermittently occupied by ocelots when the population reaches certain levels (USFWS unpublished data). At present, ocelot numbers are low and recent trapping and camera-monitoring efforts indicate that some of the area surrounding the core is unoccupied. This region that is intermittently occupied by ocelots is the area being considered for release sites.

Releasing ocelots in this periphery area surrounding the core has a number of advantages. This area has habitat that is known to be suitable for sustaining ocelots. It is adjacent to the core population and so maximizes the probability for successful integration of released ocelots into the existing population. Finally, it is not presently occupied and therefore minimizes the likelihood of immediate territorial conflict and competition between released and resident ocelots.

Figure 3. Core areas occupied by ocelots (*Leopardus pardalis albescens)* at Laguna Atascosa National Wildlife Refuge, Texas.



Most of the area surrounding the core occurs on the main unit of LANWR, although some also occurs on private and public lands surrounding the refuge. Release sites will only be chosen within the LANWR in order to increase access to release sites for researchers and to minimize any concerns landowners might have regarding endangered species on their property. However, it is possible that a translocated ocelot may eventually leave the refuge and move onto private lands. Protocols to address this possibility are discussed in Appendix 1.

In summary, the following criteria are being used to choose specific release sites within the LANWR population:

- Site is located on the LANWR.
- Site has a minimum of 65 acres of high quality ocelot habitat.
- Site has a documented history of intermittent ocelot occupation, but presently is not occupied by a same-sex ocelot as the ocelot to be released.
- Site is close and accessible to core areas that are occupied by ocelots.
- Site is not close to high-volume or high-speed roads.

Five sites have been selected as potential release sites in Cameron County. Each site meets all of the above criteria. All potential release sites will be periodically monitored through live trapping and camera efforts; monitoring efforts started in October 2008. Sites will be monitored intensively in the two months prior to translocation to determine whether the release site is currently occupied by ocelots.

The five sites that have been selected as potential release sites are described in detail in Appendix 2. Release sites include: Coyote Loop in Subunit 2, Newt Pond in Subunit 8, Horse Island in Subunit 5, Moranco Blanco in Subunit 7, and Redhead Ridge in Subunit 7. It is also possible that if part of the core area is monitored and determined to be unoccupied, that the unoccupied portion of the core could also be used as a release site.

2. Release Site Criteria for the Willacy County Population

The Willacy County ocelot population is located on privately-owned lands. The only currently suitable known location for translocation into the Willacy County population is on a portion of the Yturria Ranch under easement with the USFWS and The Nature Conservancy, although other locations may become available in the future if landowners in the area are receptive to establishing ocelots on additional sites. Ocelots on the Yturria Ranch appear to be at carrying capacity. The translocation team recognizes that introducing an ocelot into the population at Yturria Ranch may result in intraspecific aggression and may decrease the chances of success. However, the severe genetic erosion documented in the Willacy County population over the past 10 years by Janečka (2006) makes translocation and genetic augmentation a priority regardless of the risk. Criteria for release include:

- Site has a minimum of 65 acres of high quality ocelot habitat
- Site is accessible to core areas that are occupied by ocelots
- Site may be close to high-volume or high-speed roads if a suitable wildlife culvert with guide fence is located in proximity to the site

C. CAPTURE, EVALUATION, AND RELEASE OF CANDIDATE ANIMALS

We will attempt to select subadult, dispersal-aged animals to be translocated, because their removal will have the least effect on the social structure and population dynamics of the source population and they are more likely than adults to settle near their release site (Ruth et al. 1998, Moehrenschlager and Macdonald 2003). Our goal is to utilize one- or two-year-old animals (Laack 1991), but without a proven method for determining age, we will rely on tooth wear, body weight and evidence of reproductive status. Animals selected will have minimal tooth wear and will appear to have not reached full adult size (average adult weights in Tamaulipas: 10.3 kg for males, 7.3 kg for females; Caso 1994). To ensure that they are large enough to survive possible food shortages associated with learning to find prey in an unfamiliar location, females must weigh at least 6 kg and males must weigh at least 7 kg. Females must be nulliparous, as judged by the condition of their teats, and must not be pregnant at the time of capture as determined by palpation at the capture site. Any pregnant or nursing females will be released. In addition, translocation candidates must be in good physical condition without any evident abnormalities or health problems. They must have all four canine teeth when captured. Any animal judged to be inappropriate for translocation because of pregnancy, prior reproduction, poor condition, or any other reason will be released at the capture site.

Population modeling demonstrates that adding two individuals to the recipient population per translocation event maximizes the benefit obtained per translocated individual (C. Stasey, unpublished data). Because ocelots may be lost due to dispersal or mortality, we plan to translocate four individuals per event with the hope that at least two will become established in the population. Modeling also indicates that in general a sex ratio of 1:3 would optimize the beneficial demographic effects on the recipient population (C. Stasey, unpublished data), so we will attempt to translocate one male and three females during most years. However, if we are not successful in capturing the desired number of each sex within a reasonable amount of time, we may translocate two animals of each sex or four females and no males. We will also take into account changes in structure of the recipient population prior to future translocation events.

1. Activities in Mexico

a. Capture and initial evaluation

Ocelots will be captured with Tomahawk box traps and immobilized by intramuscular injection with approximately 5 mg/kg Telazol (Shindle and Tewes 2000). While under anesthesia ocelots will go through a comprehensive physical exam with a qualified veterinarian present when possible. The physical exam will include body temperature, pulse and respiratory rate, weight, sex, body measurements, age, general condition, and physical palpation to determine pregnancy status if a female. External parasites will be collected and placed in 70% isopropyl alcohol for later identification. Feces will also be collected for parasite examination, prey analysis, and stress hormone analysis. Blood will be collected at the capture site for genetic and disease analysis (as described in Section A.2.c.) to determine potential risks for disease transfer. Veterinarians at the Gladys Porter and Tamatán Zoos will determine minimum limits of risk for disease transfer in consultation with the Ocelot Translocation Team Leader, the USFWS, and the Dirección General de Vida Silvestre (DGVS). If necessary, subcutaneous fluids may be injected during the anesthetization period to reduce the risk of ocelot mortality. Parasite identification and all testing will be performed in Mexico if facilities exist or in the U.S. when facilities in Mexico are not available.

Captured animals initially deemed suitable for potential translocation will be moved to a holding facility at Tamatán Zoo within 12 hours of initial handling. Ocelots will be transported in reinforced pet carriers with visual barriers using shredded paper as bedding. Transport will occur within a covered vehicle under cool conditions. Ocelots will not be sedated specifically for transport but may be recovering from sedation following capture during the transport procedure. During transport, ocelots will be monitored for signs of stress and recovery from sedation.

b. Quarantine

During quarantine in Mexico the Association of Zoos and Aquariums (AZA) captive small carnivore guidelines will be followed (Mellen 1997). The quarantine period will consist of a minimum of 30 days. Quarantine pens will be located in a suitable area where human traffic is minimized and ocelots will be under veterinary supervision. Appendix 3 contains detailed information on pen construction and quarantine measures. Feces will be collected daily for endocrinological monitoring of stress levels. Ocelots will be monitored for condition, eating, drinking, attitude, and overall health throughout the 30-day quarantine. Dietary needs will be met by feeding a veterinarian-approved whole-prey diet including chicken, rabbit, quail, dove, or other whole prey.

1. Disease surveillance of ocelots in Mexico: Presently disease testing in Mexico appears limited to FeLv, FIV, Dirofilaria immitis, and Coronavirus using imported kit assays. Unfortunately, it is evident that no suitable resources presently exist in Mexico to perform a number of the tests for diseases we wish to monitor. Nor is it feasible to initiate a laboratory program in Mexico as the start-up and quality control assurance costs would be very high, especially considering the low number of samples and irregular collection schedule we are proposing. Therefore, we will import blood samples to the U.S. to conduct tests that cannot be done in Mexico and will obtain the required CITES permits.

2. Evaluation of ocelots prior to transportation to the U.S.:
After 26 days in quarantine, animals will be anesthetized for examination, sample collection, and prophylactic treatments. Females will undergo an abdominal ultrasound to check for pregnancy. If equipment and trained personnel are available, semen may be collected for fertility evaluation from any males deemed close enough to reproductive maturity. Blood samples will be collected for continued disease monitoring, whole-body radiographs will be taken, and the overall suitability of the animal for translocation will be reassessed. If the animal is noted to be pregnant at this time, it will be returned and released at the point of capture.

During this immobilization we will also treat with ivermectin, praziquantel, and fipronil for internal and external parasites, and vaccinate for rabies, feline diseases (e.g. panleukopenia, calicivirus, rhinotracheitis), and canine distemper.

One particular criterion for translocation that will be assessed at this time will be damage to canines. If one canine is damaged it will be repaired and the ocelot can be translocated to the U.S. and released. If two or more canines are damaged or other abnormalities are noted, then the on-site veterinarian will make a decision as to whether the ocelot will be translocated and released.

c. Policy for animals deemed unsuitable for translocation in Mexico

Ocelots not deemed suitable for translocation to the U.S. will be evaluated for release back into the wild at the point of capture. This determination will be made by the Tamatán Zoo director, Tamatán Zoo senior veterinarian, and on-site wildlife biologist in consultation with U.S. counterparts. If release back into the wild is not possible, then the ocelot will be placed in a Mexican zoological facility that is a member of the Asociación de Zoológicos, Criaderos y Acuarios de México (AZCARM). If neither of these scenarios is deemed an option, then euthanasia may be applied as a last resort. Euthanasia will be a veterinary decision based on quality of life considerations. The on-site veterinarian will attempt consultation with U.S. veterinary counterpart, USFWS Ocelot Biologist, and Translocation Team Leader when considering euthanasia. Any ocelot that dies or is euthanized in captivity or during capture will have a necropsy and histopathology performed. See Appendix 4 for necropsy responsibility, specimen placement, and necropsy protocols.

2. Transfer from Mexico to U.S.

Appropriate permits from Mexico and the U.S., along with appropriate permits from the States of Tamaulipas and Texas, will be obtained prior to translocation. Permits include CITES export/import permits, Federal endangered species permits from both countries, customs export permits, and Texas Parks and Wildlife Department permits. The Brownsville port of entry will be used. The local USFWS inspector and entry port will be notified one week prior to moving an ocelot across the international border. A certificate of health and proof of rabies vaccination issued by a Mexican veterinarian will be obtained. Transport of each ocelot will be done using the constructed nest box contained within the quarantine pen at Tamatán Zoo and take place in the manner outlined earlier under transport from capture site.

3. Activities in U.S.

a. Acclimation Period

To accustom ocelots to environmental conditions at the release site and reduce the tendency for long-distance movement following release, animals will be held in acclimation pens at the release sites for approximately 30 days. During this time the AZA captive small carnivore guidelines will be followed (Mellen 1997). Acclimation pens will be located at the point of release and human traffic will be minimized. The details of pen design are in Appendix 3. Ocelots will be under veterinary supervision and their care will be supervised by animal husbandry staff from the Gladys Porter Zoo. If possible remote surveillance monitoring may be incorporated. Feces will be collected daily, if possible, for endocrinological monitoring of stress levels. Ocelots will be monitored for condition, eating/drinking, attitude, and overall health throughout the acclimation period. Dietary needs will be met by feeding a veterinarian-approved diet consisting primarily of whole prey including chicken, rabbit, quail, and rodents.

Anesthesia for a final physical examination will occur towards the end of the acclimation period (i.e., day 25 or later). If the animal is deemed suitable for release a PIT tag will be implanted (if not done previously) and a radio-collar will be attached. Semen will be collected from males (if not done previously). Again, the animal will be determined a suitable candidate for release as long as fewer than two canines are damaged, females are not pregnant, and other abnormalities are not noted by the on-site veterinarian.

Prior to and during the acclimation period, resident ocelots in the area will be captured, radio-collared, and monitored, if possible, to document interactions with translocated animals and to monitor changes in resident movement or behavior patterns.

b. Policy for animals deemed unsuitable for release in the U.S.

Ocelots not deemed suitable for release in the U.S. following acclimation will be evaluated for transport and release back into the wild at the point of capture. The viability of this option will be determined by the USFWS Ocelot Biologist, Translocation Team Leader, Gladys Porter Zoo director, Gladys Porter Zoo senior veterinarian, and the on-site wildlife biologist, in consultation with the Tamatán Zoo director and Tamatán Zoo veterinarian. If return to Mexico and release back into the wild is not possible, then the ocelot will be placed in a zoological facility that is a member of the AZA and participates in the Ocelot Species Survival Plan. As a last resort, the following euthanasia policy will apply. Euthanasia is considered to be a veterinary decision based on quality of life considerations. The on-site veterinarian will attempt consultation with USFWS Ocelot Biologist, Translocation Team Leader, Tamatán Zoo director, and Tamatán Zoo veterinarian when considering euthanasia. Any ocelot that dies or is euthanized in captivity or during capture will have a necropsy and histopathology performed. See Appendix 4 for necropsy responsibility, specimen placement, and necropsy protocols.

c. Release

Animals will be released by opening enclosure doors and letting them exit at will. Continued provisioning of food will be provided for up to two weeks following release. After enclosure doors are opened and ocelots leave the holding pens, they will be radio-located and remotely monitored hourly for up to 48 hours depending upon arrangements with those responsible for managing the release area. They will then be located daily for the first two weeks, followed by monitoring every other day for two weeks, then once a week.

d. Monitoring Post-release

Movements and activity of released ocelots will be regularly monitored through radio-telemetry, and we will attempt to trap and re-collar them whenever necessary to facilitate continuous monitoring for at least five years, if feasible. This will allow us to calculate the direction of their initial movements (to assess homing tendencies), the time to home range establishment, their eventual home range size, and their habitat use patterns. It may also provide evidence of direct or indirect interactions between released and resident felids.

Whenever ocelots are captured for radio-collar replacement, samples will be collected to assess disease and endocrine status. These will serve as indicators of how ocelots may be affected by their new environment. If possible, we will collect semen from males during at least one recapture event to assess fertility at full maturity. Diet of released animals will be assessed through fecal analysis whenever samples can be obtained. We will attempt to find, PIT tag and sample for genetics all litters produced by released and resident ocelots. During the first few years we will focus on documenting reproduction of translocated individuals and monitoring the presence of unique alleles from both Mexico and the U.S. in the litters that are produced. Information on presence and frequency of unique alleles may be used to guide decisions regarding how long to continue translocations and/or how many individuals to translocate per year. After four years we will calculate levels of genetic diversity in the population as a whole to determine whether and to what extent we have successfully increased overall levels of heterozygosity.

Long-term monitoring will enable us to calculate vital rates such as mortality rate, age of first reproduction, reproductive rates and success, and juvenile mortality. We will also be able to monitor changes in population parameters over time, including genetic diversity, population growth rate, and dispersal patterns.

Comparing data from released animals with equivalent data from residents and the source population will allow us to evaluate the effectiveness of our actions and the impacts of translocation on both translocated animals and residents. For example, genetic analyses will reveal whether translocated males successfully reproduce and indicate whether diversity increases in the recipient population following translocation. Data on male fertility and reproductive and mortality rates will indicate whether those measures of fitness are lower in Texas populations than in ocelots from Tamaulipas, and whether they improve in Texas ocelots following translocation. We may be able to distinguish the effects of genetic status from the effects of ecological conditions on parameters such as space use, habitat use, diet, and dispersal patterns.

All deceased ocelots will be located as fast as possible and an attempt to determine cause of death will be undertaken in consultation with Gladys Porter Zoo Senior Veterinarian following the necropsy protocol in Appendix 4.

If animals are judged to be in danger, based on location or behavior, then we will attempt to capture them following the emergency rescue procedures outlined in Appendix 1 and re-release after an additional holding period, which is not to exceed 30 days. Ocelots held for a length of time will undergo a physical evaluation as described in earlier sections prior to release.

III. TRANSLOCATION TIMELINE

The following timeline is subject to annual review and amendment over the life of the project. (Note: A more detailed timeline for years 1 and 2 is provided in Appendix 5.)

<u>Year 1 – 2009</u>
Survey and evaluate potential source populations.
Survey and evaluate recipient Cameron population.
Survey and evaluate recipient Willacy population.
Develop translocation plan.
Obtain permits for translocation.
Monitor source populations and identify potential source individuals.
Capture targeted ocelots and hold in quarantine.
Determine selection criteria and begin to identify potential release sites for establishment of new ocelot populations or subpopulations.

<u>Year 2 - 2010</u>
Translocate and monitor two to four ocelots within the Cameron population.
Continue to monitor source populations and identify potential source individuals.
Continue survey and evaluation of the Willacy population.
Begin survey and evaluation of potential release sites for a new ocelot population.

<u>Year 3 - 2011</u>
Continue to translocate to and monitor the Cameron population.
Translocate and monitor one to two ocelots within the Willacy population.
Complete evaluation of potential sites and select one or more sites for establishment of new ocelot population(s).
Obtain permits for establishing new population(s).
Continue to monitor source populations and identify potential source individuals.

<u>Year 4 - 2012</u>
Continue to translocate to and monitor the existing Cameron and Willacy populations.
Begin initial release of ocelots into the new population in Texas and monitor.
Continue to monitor source populations and identify potential source individuals.

<u>Year 5 - 2013</u>
Continue augmentation and/or monitoring of the existing Cameron and Willacy populations.
Evaluate initial release of ocelots into the new population and recommend improvements.
Continue releasing ocelots into the new population and monitor.

Continue to monitor source populations and identify potential source individuals.
Plan for the next 5 years.

IV. FUNDING PLAN

Funding will be pursued by individual partners in coordination with participating organizations. For example, funding for the initiation of the translocation project was provided by USFWS and the Friends of Laguna Atascosa National Wildlife Refuge (Friends). Pre-release monitoring at LANWR was undertaken by the USFWS with assistance provided by Friends, the Gladys Porter Zoo, and the Dallas Zoo. Disease profiling of ocelots in Cameron County was undertaken by the Gladys Porter Zoo and USFWS, while pursuit of funding for source population assessment and surveying in Mexico was undertaken by USFWS, Friends, and Texas A&M University's Caesar Kleberg Wildlife Research Institute with support from George C. (Tim) and Karen Hixon Foundation. It is the goal of the Translocation Team to continue pursuing various funding sources in a similar cooperative fashion with different organizations assuming lead roles. All funding will be coordinated through the Translocation Team Leader to help ensure overlap does not occur.

V. ESTABLISHMENT OF ADDITIONAL POPULATIONS

The USFWS's Ocelot Recovery Team has identified the establishment of a new ocelot population in Texas as an important recovery action. Another objective of the translocation project is to create new populations of ocelots in Texas to prevent extinction due to catastrophic events. To meet this objective, one or more new stable populations should be established within 20-30 years.

The new population should be geographically and demographically independent of the two existing populations. This new population would increase the number of ocelots in Texas, thus reducing the vulnerability to extinction of this rare cat in the U.S. Additionally agencies in Mexico have expressed interest in returning ocelots to unoccupied areas within their former range in Mexico. Modeling shows that a larger population is less vulnerable to extinction, particularly once it grows beyond 75 to 150 individuals.

Establishment of a new population in another area of Texas that is geographically separated from the two existing small populations reduces the probability that a catastrophic event such as a disease epidemic, regional drought, extensive landscape fire, or major hurricane will decimate the overall population. This strategy reduces the risk and effect of such a catastrophe on the overall population and provides for greater numbers of ocelots in Texas. In addition, this new population may serve as a source of individuals for future translocations to augment smaller ocelot populations isolated by extensive agriculture and urbanization.

Establishing a new population would increase the resilience and long-term viability of ocelots in the U.S. It would also decrease the need to translocate ocelots from Mexico into Texas, and may even provide a reservoir of individuals, if the need ever arises, to assist distressed ocelot populations in Mexico.

Ideally, establishment of one large population is preferred for any new location, but past research has shown that habitat is limited and widely separated in parts of Mexico and Texas. Consequently, it is more likely that a metapopulation will be created with two or three smaller subpopulations connected by natural dispersal. In addition, past research has revealed that ocelots in remnant Texas populations use primarily thornshrub habitat (Laack 1991, Shindle 1995, Harveson et al. 2004) with >95% canopy cover (Horne et al. 2009), although they have also been found in less canopy cover and using dense riparian habitat, live oak forest with dense understory, and other habitats (Navarro-Lopez 1985, Caso 1994). Initial ecological niche models indicate that the ocelot niche is best represented in the area south of Corpus Christi and south of the area from Wharton County extending in a westward line to Kinney County (J. Young unpubl. data, Figure 4). Further analysis of the predicted niche and on-the-ground surveys will need to be done to evaluate the best suitable areas for a potential site.

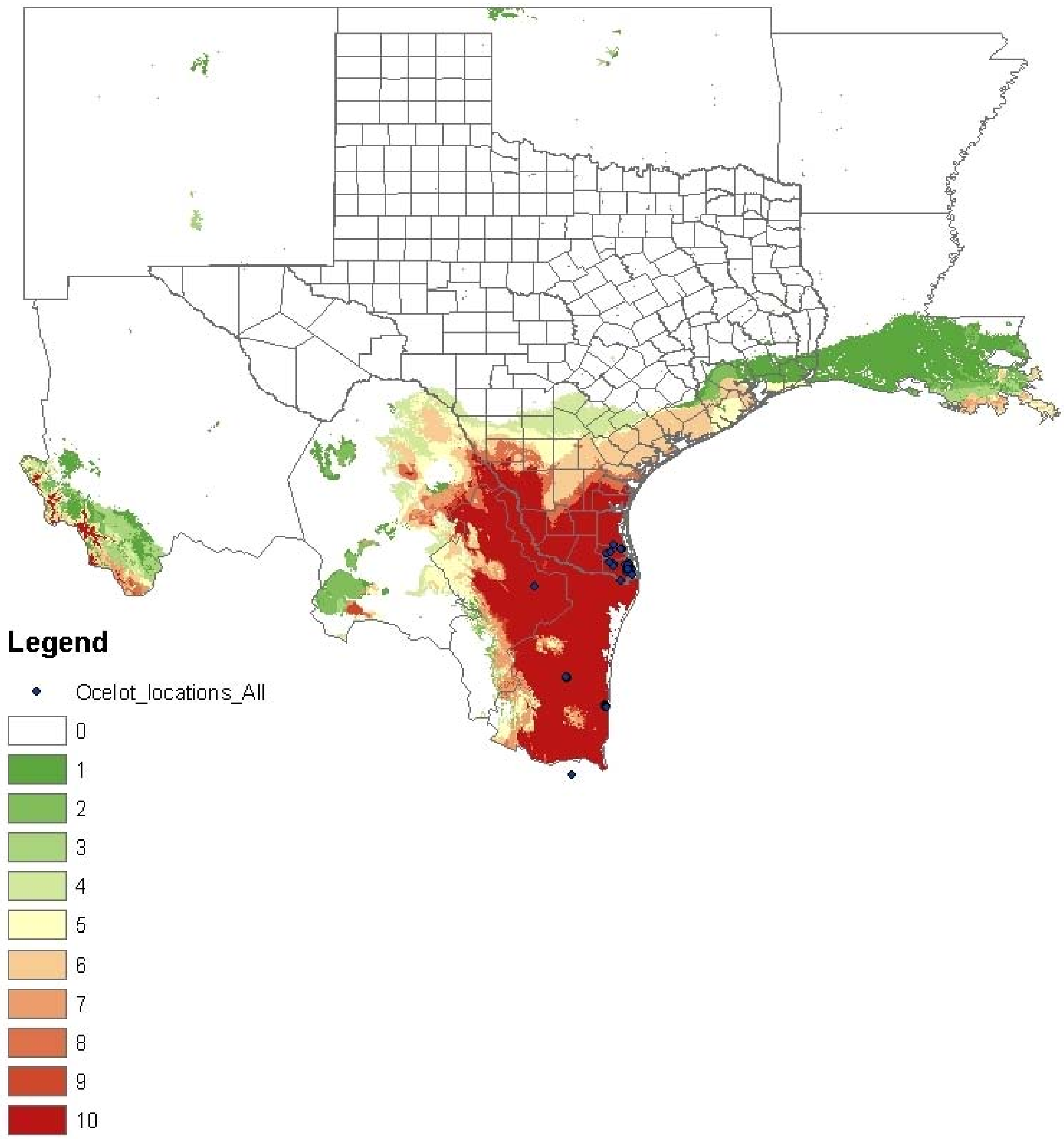
There are several considerations that should be evaluated during selection of one or more release sites for the new ocelot population. Presence of sufficient quality and quantity of habitat for the targeted population size is essential. The potential security and expansion of this habitat is another factor to assess, and an adequate prey base is vital.

One of the most important considerations is the role and support of landowners. About 97% of Texas is privately owned, and landowners control the land use and habitat on most potential release sites. Additionally the majority of land along the Tamaulipan coast is privately owned. The development of partnerships with supportive landowners and their neighbors is essential for the establishment of a new ocelot population that will require an extensive area.

Because considerable funds will be expended to establish a new population, there needs to be some level of assurance that the release habitat will mostly remain intact until the population has become stable with dispersal and colonization of surrounding habitats. Cooperating landowners should be willing to allow biologists access for population monitoring and management.

Potential threats also need to be evaluated, including risks from road mortality, trapping for furbearers or predator control, disease, and an overabundance of predators or competitors. Also, projected development of threats from urbanization, housing developments, road development, and overall increase of the human population should be assessed. The risk that these factors pose for future population expansion and habitat connectivity should also be considered.

Figure 4. Predicted ecological niche of ocelots in Texas and Tamaulipas based on preliminary modeling with the genetic algorithm for rule-set procedure (GARP) (J. Young unpubl. data).



Planning activities and development of contingency scenarios for the establishment of a new ocelot population in Texas should begin in the near future. Over the next three years, we will evaluate potential release sites for a new ocelot population in Texas. A list of criteria will be identified, and ranked according to importance and likelihood of achievement. These criteria will be used, in part, for identifying habitats or groups of suitable tracts for further consideration as potential release sites. This first round of qualifiers should begin with biological criteria, such as quality and quantity of appropriate habitat, prey abundance, and preliminary assessment of predators, competitors, diseases, and other biological risks.

Subsequent evaluations should expand to cover other considerations involving methodological, social, political and economic factors, and most importantly, potential partnership with key landowners and their neighbors. Use of population viability analysis and population modeling for particular release areas will provide additional guidance for site selection. These other factors will enhance the selection process, particularly when they are laid upon a solid biological and scientific foundation.

Two to four potential release sites should eventually be identified based on a myriad of factors. Thorough field surveys should be conducted at these potential release sites to verify their ecological suitability and investigate any potential complicating factors that might affect the likelihood of successful translocation.

A site-specific reintroduction plan should be developed for the new population, whether it occurs on private or public lands. Participation and involvement of private landowners throughout this process will be important. The initial phase of translocating ocelots into a new population, which should begin at a small scale and on an experimental basis, should be initiated within three to five years. The information feedback from the early releases will be used to refine and enhance subsequent translocations into the new population.

VI. CONCURRENT AND FUTURE ACTIONS

Translocation is only one strategy suggested by the USFWS's Ocelot Recovery Team to address conservation of ocelots in Texas and Tamaulipas. Other activities that are and will be ongoing while we pursue translocation and future planned actions include:

- mapping of potential available habitat in the U.S. (on-going by Texas State University),
- assessing distribution, population estimation, and potential available habitat in Mexico (on-going by Caesar Kleberg Wildlife Research Institute),
- assessing disease risk and profiles in Texas and Mexico populations (on-going by Gladys Porter Zoo),
- protection of additional land around existing core populations through a variety of instruments including development of landowner wildlife management plans, conservation easements, and land acquisition (ongoing by The Nature Conservancy, USFWS, The Conservation Fund, and Environmental Defense Fund),

- restoration of habitat in and around core populations or in areas that establish connectivity between blocks of habitat (ongoing by Lower Rio Grande Valley NWR, Environmental Defense Fund, and The Nature Conservancy),
- identification and promotion of mechanisms to reduce or alleviate significant threats to ocelot populations (e.g. construction of wildlife underpasses to reduce road mortality),
- provision of public education and outreach regarding the conservation of ocelots (on-going by Friends, Dallas Zoo, and USFWS), and
- continued long-term monitoring of existing populations to allow for adaptive management (ongoing by LANWR, Caesar Kleberg Wildlife Research Institute, and Lower Rio Grande Valley NWR).

Ocelot recovery in the U.S. and Mexico will require additional partnerships and subcommittees to implement various recovery strategies suggested by the USFWS Ocelot Recovery Team. It is the hope of the Translocation Team that additional subcommittees will be established in the future to address and focus on other recovery strategies.

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APPENDIX 1. EMERGENCY RESCUE PROTOCOL FOR TRANSLOCATED OCELOTS

When translocated ocelots are released and their movements place them in locations or situations determined to be unviable, then intensive efforts to rescue them should be undertaken.

Unviable situations may include released ocelots that have an unacceptably high risk of mortality, such as range establishment around a highway or high-volume road, human habitations, or other high-risk environments. Unviable determinations may also include landowner disagreement with translocation goals, or released ocelots that have an unacceptably low chance of contributing reproductively to the ocelot population, such as occupying remote, isolated habitat fragments with no indication of other ocelots in the area.

Once it has been determined that a translocated ocelot has moved into an area where it should be recaptured, the following rescue steps are recommended.

During the late morning after nocturnal ocelot movements have ceased, biologists will saturate the area around the resting ocelot with box traps. They must be careful to minimize disturbance, yet be near enough to facilitate trap success. If the ocelot moves, then the traps will be moved to the next location. Once the ocelot is captured, it will be sedated and returned to the in-situ holding pens in either the Cameron or Willacy release site. If malnutrition, injury or another problem is detected, then it may be determined to return the individual to an ex-situ environment (i.e. Gladys Porter Zoo) to administer food and care until the ocelot regains nutrition, body weight and health.

Only under dire or emergency situations should direct capture and sedation be attempted. Such situations may include an ocelot cornered in a tree within a residential environment, immediate high threat from vehicular traffic, or other imminent high-risk situations. A long pole syringe, blow gun, or CO_2 gun and projectile may be used to sedate the ocelot by a qualified, experienced handler. In addition, a veterinarian should be present. Proper handling equipment should be available, including a net or fabric to capture the fall of a sedated ocelot from an elevated position.

Generally, a rescued ocelot will be returned to the original release area and eventually released. If this problem develops a second time, and another rescue or intervention is required, then the ocelot should be evaluated for release at the second general area in either the Cameron or Willacy release site.

If a third intervention or rescue is required, the fate of the ocelot will be collectively decided by the Ocelot Translocation Team Leader in consultation with the USFWS and DGVS. This ocelot may be returned to a release environment, or placed into a captive facility in Texas. The ocelot will not be returned to Mexico.

APPENDIX 2. POTENTIAL OCELOT RELEASE SITES AT LAGUNA ATASCOSA NATIONAL WILDLIFE REFUGE

Coyote Loop in Subunit 2: Coyote Loop is located along the west side of Laguna Atascosa Lake. It has about 235 acres of high-quality, dense thornscrub. In the past, both male and female ocelots have occupied this area for extended time periods (> 1 year). Ocelots that occupied Coyote Loop in the past were able to move freely to the core area. This site has one low-use, dirt, refuge service road and is located about 4 km from the closest paved highway.

Newt Pond in Subunit 8: This site consists of 555 acres of medium to high quality ocelot habitat. In the past, both male and female ocelots have occupied this area for extended time periods (>1 year). Ocelots that have occupied Newt Pond in the past were able to move to the core area and to Horse Island. This site has two low-use, dirt, refuge service roads and is located about 5 km from the closest paved highway.

Horse Island in Subunit 5: This area has 279 acres of medium to high quality ocelot habitat. In the past, both male and female ocelots have occupied Horse Island for extended time periods (>1 year), and a natal den was also found at this site. An island attached to the mainland by one dike, Horse Island is more isolated from the core area than the other release sites, but it is possible for ocelots to reach the core area. Male ocelots that have used Horse Island in the past readily crossed the dike to visit the Grebe Pond area. Horse Island has one low-use, dirt, refuge service road and is located about 7 km from the closest paved road.

Moranco Blanco in Subunit 7: This site contains 67 acres of high quality thornscrub habitat and is located in the southeast corner of the refuge's main unit. In the past, both male and female ocelots have occupied Moranco Blanco for extended time periods (>1 year). This area is somewhat isolated from the core area by coastal prairie, but male ocelots that have occupied this area in the past have regularly moved back and forth between the core area and Moranco Blanco. Moranco Blanco has one low-use, dirt, refuge service road and is about 1 km from a day-use, one-way, 35 mph, paved refuge tour road. It is located about 6 km from the closest paved state highway.

Redhead Ridge in Subunit 7: Redhead Ridge consists of 122 acres of medium to high quality thornscrub habitat. It is located along the Laguna Madre on the east side of the refuge. It is readily accessible to the core area. Both male and female ocelots have occupied Redhead Ridge for extended time periods in the past (> 1 year). There are no roads on this patch of habitat. A day-use, one-way, 35 mph, paved tour road runs adjacent to Redhead Ridge, but because no thornscrub habitat occurs on the other side, ocelots are not likely to cross this road. Redhead Ridge is located about 5 km from the nearest paved state highway.

APPENDIX 3. QUARANTINE AND ACCLIMATION PEN SPECIFICATIONS

Quarantine Pens

The Tamatán Zoo in Ciudad Victoria, Tamaulipas, has agreed to quarantine all ocelots captured in the field and selected for potential translocation. Based on a site visit in January 2009 by Translocation Team members and meeting with Director General Vicente Mongrell Baviera, a secluded off-exhibit location was chosen across from the main zoo to build quarantine pens. The area to be utilized overall is approximately 22 ft x 84 ft (6.7 m x 25.6 m). Within this area four pens will be constructed, each 10 ft x 22 ft (3.0 m x 6.7 m) with 10 ft (3 m) of space between each pen and approximately 14 ft (4.3m) between the first pen and the rest of the off-exhibit compound. This location is bounded on one side and one end by a 7-ft-high (2.1 m) solid concrete block wall topped with a 6-ft (1.8 m) chain-link fence which separates the zoo from the surrounding neighborhood. The other side is separated from a variety of non-carnivore animals (e.g. llamas, peccaries) by a 4-ft-wide (1.2 m) and 8-ft-tall (2.4 m) chain-link fence-covered walkway. The other end faces an open compound and can be fenced off for privacy. The pens will be constructed of either chain-link or 1 in x 1 in (2.54 cm x 2.54 cm) wire mesh, including a covered top, using either metal or wooden supports. The ground is earthen and will be planted with grass and shrubs, including shrubs between pens to provide visual barriers. Entry to the pens will be through doors made in the mesh-covered walkway so that there is double containment should an animal escape its primary pen. Each pen will have a nest box which will also serve for the ocelot's transport to the U.S. and will be utilized in the acclimation pens at the release site.

Because this area is separated from most of the zoo, medical quarantine procedures can be easily set up with a limited number of keeper attendants, disinfectant footbaths to diminish the spread of diseases to and from quarantine, and privacy. In the nearby compound are facilities for diet preparation and veterinary examination and treatment.

Acclimation Pens

Once the release sites are chosen, individual release pens will be constructed utilizing portable 6-ft x 10-ft (1.8 m x 3.0 m) chain-link dog kennel panels and material available at local large home building supply outlets. Double containment will be employed with a primary pen for the translocated ocelot with dimensions 10 ft x 20 ft x 6 ft high (3.0 m x 6.1 m x 1.8 m) surrounded by a secondary pen of dimensions 20 ft x 30 ft x 6 ft high (6.1 m x 9.1 m x 1.8 m). The secondary pen not only provides further containment, but also deters native wild animals from directly contacting the ocelot at the primary fence barrier. To further deter wild animals, solar-powered electric fence wire will be attached to the outside of the secondary pen. Both pens will be covered over the top with 1-in x 1-inch (2.54 cm x 2.54 cm) galvanized hardware mesh and the secondary pen will have the same mesh tied onto the outside of the panels for further security. Shade cloth will cover the ceiling and reed fencing will be attached to half of the primary pen to promote cover and privacy, although as much natural vegetation will be conserved inside the pen as possible. The same nest box that is utilized in the quarantine pen and for transport will serve also in the primary pen.

One possible enhancement to both quarantine pens and release pens would be a video monitoring and recording system to permit continuous observation of ocelots inside the pens as well as potential intruders on the periphery of the pens. The potential benefits will be weighed against the costs to purchase and operate the system.

APPENDIX 4. PROTOCOL FOR NECROPSY AND SPECIMEN PRESERVATION

In Mexico, necropsies will be performed by the chief veterinarian of Tamatán Zoo. Histopathology tests will be performed at Facultad de Medicina Veterinaria Y Zootecnia, Universidad Autónomo de Tamaulipas, Cuidad Victoria. Animal remains will be accessioned into the National University of Mexico.

In the U.S., necropsies will be performed by Gladys Porter Zoo veterinarians. Animal remains will be accessioned into a suitable museum such as the Texas Cooperative Wildlife Collection, Texas Tech University, or elsewhere following necropsy.

PERSON COMPLETING FORM

____

ADDRESS

____

____

CONTACT TELEPHONES ______________________________ home / work / cell

______________________________ home / work / cell

CAT LOCATION (Description and GPS coordinates)

____

IDENTIFICATION ____________ WEIGHT ______________

AGE/BIRTH DATE ____________ SEX ______________

REPRODUCTIVE HISTORY (if any)__________________________________

DATE OF DEATH ____________ DATE OF NECROPSY ____________

PERSONNEL PRESENT AT NECROPSY

____

____

HISTORY: (briefly summarize clinical signs, circumstances of death and attach medical records):

SHIPPING TISSUES: PLEASE OBTAIN PROPER CITES AND EXPORT PERMITS BEFORE SHIPPING TISSUES.

After 72 hrs in fixative, ship tissues in a leak-proof container in adequate formalin to keep tissues moist. Frozen tissue sections need to be shipped on ice by overnight mail. Tissues can be shipped by courier to:

In the U.S.:

Texas Veterinary Medical Diagnostic Laboratory
1 Sippel Rd
College Station, TX 77843
979-845-3414
Charges will be incurred; contact Gladys Porter Zoo Animal Health Department for account number. Tel: 956-546-0044.

Or

Zoological Pathology Program
c/o Brookfield Zoo Hospital
3300 Golf Road
Brookfield, IL 60513

If you have any questions, please contact either Drs. Karen Terio or Michael Kinsel:
Phone: 708-216-1185 Fax: 708-216-5934
E-MAIL: Dr. Karen Terio: kterio@lumc.edu
Dr. Michael Kinsel: mkinsel@lumc.edu
This analysis would be gratis.

In Mexico:

Centro de Diagnóstico
Attn: Dr Norverto Treviño Zapata
Facultad de Medicina Veterinaria Y Zootecnia,
Universidad Autónomo de Tamaulipas
Dirección: Carretera Victoria- Mante Km 5.
Cuidad Victoria, TAMPS

STANDARD FROZEN (-70^{o}C IF POSSIBLE) TISSUE CHECK LIST:
Please hold samples at your institution for future toxicological or nutritional analysis if necessary.
____ Liver
____ Kidney
____ Brain (portion of cerebral cortex)

STANDARD FIXED TISSUE CHECK LIST:
Preserve the following tissues in 10 % buffered formalin at a ratio of 1 part tissue to 10 parts formalin. Tissues should be no thicker than 1 cm. INCLUDE SECTIONS OF ALL LESIONS AND SAMPLES OF ALL TISSUES.

___ Liver - sections from 3 lobes, including gall bladder

___ Spleen - cross section including capsule.

___ GI Tract - 3 cm long sections of:

___ Esophagus

___ Stomach - sections from cardia, fundus (body), and antrum of pylorus

___ Small intestines - duodenum, jejunum, ileum

___ Large intestines - cecum, colon

___ Omentum - ~3 cm square

___ Pancreas - representative sections from two areas including central ducts

___ Adrenal - entire gland with transverse incision.

___ Kidney -cortex and medulla from each kidney

___ Urinary bladder, ureters, urethra - cross section of bladder and 2 cm sections of ureter & urethra.

___ Reproductive tract - Entire uterus and ovaries with longitudinal cuts into lumens of horns. Both testes (transversely cut) with epididymis. Entire prostate, transversely cut.

___ Salivary gland

___ Oral/pharyngeal mucosa

___ Tongue - cross section near tip including both mucosal surfaces

___ Lung - sections from several lobes including a major bronchus

___ Trachea

___ Thyroid/parathyroids - leave intact.

___ Lymph nodes - cervical, mediastinal, bronchial, mesenteric and lumbar. Cut transversely.
___ Thymus

___ Heart - longitudinal sections including atrium, ventricle and valves from right and left sides.

___ Eye - both eyes intact. Remove extraocular muscles and periorbital tissues.

___ Brain - cut longitudinally along midline. Submit entire brain and pituitary gland.

___ Spinal cord (if neurologic disease) - sections from cervical, thoracic and lumbar cord.

___ Diaphragm and Skeletal muscle - cross section of thigh muscles.

___ Bone: Opened rib or longitudinally sectioned ½ femur - marrow must be exposed for proper fixation.

___ Skin - full thickness of abdominal skin, lip and ear pinna.

___ Neonates: umbilical stump - include surrounding tissue

GROSS EXAMINATION WORKSHEET

PROSECTOR ____

GENERAL CONDITION: (Nutritional condition, physical condition)
Neonates: examine for malformations (cleft palate, deformed limbs, etc)

SKIN: (Including pinna, feet)

MUSCULOSKELETAL SYSTEM: (Bones, joints, muscles)

BODY CAVITIES: (Fat stores, abnormal fluids)
Neonates: assess hydration (tissue moistness)

HEMOLYMPHATIC: (Spleen, lymph nodes, thymus)

RESPIRATORY SYSTEM: (Nasal cavity, larynx, trachea, lungs, regional lymph nodes)
Neonates: determine if breathing occurred (do the lungs float in formalin?)

CARDIOVASCULAR SYSTEM: (Heart, pericardium, great vessels)

DIGESTIVE SYSTEM: (Mouth, teeth, esophagus, stomach, intestines, liver, pancreas, mesenteric lymph nodes). Neonates: is milk present in the stomach?

URINARY SYSTEM: (Kidneys, ureters, urinary bladder, urethra)

REPRODUCTIVE SYSTEM: (Testis/ovary, uterus, vagina, penis, prepuce, prostate, mammary glands, placenta)

ENDOCRINE SYSTEM: (Adrenals, thyroid, parathyroids, pituitary)

NERVOUS SYSTEM: (Brain, spinal cord, peripheral nerves)

SENSORY ORGANS (Eyes, ears)

PRELIMINARY DIAGNOSES:

LABORATORY STUDIES:(List bacterial and viral cultures submitted and results, if available)

APPENDIX 5. DETAILED TIMELINE FOR THE INITIAL TRANSLOCATION OF OCELOTS TO LANWR (2009-2010)

Target date for initial on-the-ground translocation = Winter 2009/2010

Dates	Actions
August 2008 - May 2009	Formation of working group and development of translocation plan
October 2008 - end of project	Monitoring of recipient population and identification of suitable release sites
February 2009 - end of project	Evaluation and monitoring of potential source population
February 2009 - end of project	Outreach and education for local landowners, elected officials, wildlife managers, media outlets and the general public
June 2009	Distribution of translocation plan to Ocelot Recovery Team for comment and approval
May - July 2009	Preparation and submission of applications for export, import, and release permits
September 2009	Group assessment of project progress and decision on whether to proceed with plans to translocate animals in winter 2009-2010
September 2009	Construction of quarantine facilities at Tamatán Zoo
October - December 2009	Capture, evaluation, and quarantine of translocation candidates
December 2009	Construction of acclimation pens at LANWR
January - February 2010	Export/import and acclimation of translocation candidates
February - March 2010	Release from acclimation pens
February 2010 - end of project	Monitoring of released animals