Global Re-introduction Perspectives: 2016

Case-studies from around the globe

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IUCN/SSC Re-introduction Specialist Group (RSG)

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Re-introduction of the Mexican Wolf in Arizona and New Mexico, USA

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Introduction

Mexican wolf (*Canis lupus baileyi*) re-introduction in the United States has been ongoing since 1998 as part of our recovery program for this endangered subspecies. Mexican wolves historically ranged from the southwestern United States through central Mexico, but were extirpated from the wild by the 1980s. Mexican wolves are listed as endangered under the Endangered Species Act (ESA), and are protected as a subspecies at risk by Mexico. Mexican wolves are included in the gray wolf entry on the IUCN Red List (categorized as Least Concern due to the status of gray wolves worldwide). Mexican wolves are the rarest, most unique subspecies of gray wolf in North America.

The U.S.-Mexico bi-national captive-breeding program established for the Mexican wolf in the early 1970s was founded with only seven Mexican wolves. In the United States, we are re-introducing Mexican wolves in Arizona and New Mexico within the Mexican Wolf Experimental Population Area (MWEPA). This designation, under section 10(j) of the ESA, allows flexibility in our management of Mexican wolves. Mexican wolves are not present in the wild in the United States outside of the MWEPA. Mexico is conducting an independent re-introduction of Mexican wolves in Mexico.

Mexican wolf © George Andrejko

Goals

- Goal 1: Establish a population of 300 - 325 Mexican wolves in the Mexican Wolf Experimental Population Area.
- Goal 2: Decrease genetic risks to the population, including reducing mean kinship, inbreeding, and loss of heterozygosity.
- Goal 3: Minimize negative impacts to livestock producers and communities from Mexican wolf re-introduction, including seeking funding for the Mexican Wolf/Livestock Coexistence Council, which provides funding to livestock producers for proactive measures to decrease the likelihood of livestock depredation, payments for presence to offset indirect costs, and depredation compensation for direct costs.
- Goal 4: Develop a revised recovery plan to guide the Mexican wolf recovery program.
- Goal 5: Maintain and strengthen interagency partnerships and relationships with local communities and tribes.

Success Indicators

- Indicator 1: Mexican wolf population is growing by approximately 10% annually, including reaching a population size of approximately 150 within the next five years, 200 within the next eight years, and 300 - 325 within 13 years.
- Indicator 2: An adequate number of effective migrants are added to the experimental population over several generations to decrease genetic risks for the population via the release of Mexican wolves from captivity to the wild.
- Indicator 3: The Coexistence Council is able to provide adequate funding to livestock producers to conduct proactive management actions that will decrease livestock depredations, compensate for depredations, and provide payments for presence of Mexican wolves.
- Indicator 4: A recovery plan is finalized during 2016 - 2017.
- Indicator 5: Working relationships with partner agencies, local communities, and tribes are effective in moving recovery forward.

Project Summary

Feasibility: The current focus of this project is to establish a population of 300 - 325 Mexican wolves in the MWEPA. We expect this population to contribute to recovery of the Mexican wolf under the ESA, which will likely require several populations and considerably more than 300 Mexican wolves in the United States and Mexico. The MWEPA contains adequate suitable habitat to support our population objective at a density that we expect will not negatively impact native ungulate populations. (Mexican wolves' primary prey is currently elk. Deer, other ungulates, and small mammals are also preyed upon, as well as livestock.) Therefore, from an ecological perspective, the feasibility of the project is high. Although the re-introduction and recovery of the Mexican wolf is strongly supported by the public at large, it is highly controversial with local communities, who have concerns about human safety and economic impacts on the livestock and hunting industries. In addition, the MWEPA spans tribal lands of two dozen Native American tribes, who have varying levels of support for, or concern about,

Mexican wolf occupancy on their land. Therefore, the socio-political landscape of Mexican wolf re-introduction is very complex.

Implementation: We have been re-introducing the Mexican wolf in the United States with our partner agencies since 1998. Currently, our partner agencies include Arizona Game and Fish Department, White Mountain Apache Tribe, U.S. Forest Service, USDA Wildlife Services, and Gila, Greenlee, Navajo, Graham, and Eastern Arizona Counties Organization. Over the 17 years of the re-introduction project, we have improved our techniques for conducting successful management actions such as the release of wolves from captivity, translocating wolves from one area to another, conducting management actions in response to depredation or nuisance behavior, and most recently, cross-fostering Mexican wolves in the wild (offspring that are removed from their biological parents and raised by surrogate parents). In January 2015, we revised the regulations established in 1998 for the MWEPA in order to improve our conservation of the Mexican wolf and our management flexibility of the experimental population. Our revised regulations expand the area where the experimental population can occur from of 18,679 km^2 to over 398,477 km^2 (including 81,229 km^2 of suitable habitat). The revised regulations also expand the area in which we can release Mexican wolves from captivity into the wild from 2,986 km^2 to 32,392 km^2. We will be working with our partner agencies in 2015 to implement these new regulations and adjust our management over this larger area.

Post-release monitoring: Routine (weekly) monitoring of Mexican wolves is conducted. Mexican wolves captured in, or released to, the wild are fitted with radio-collars, with a goal to maintain two radio-collared wolves per pack. Locational data is recorded into a database to be correlated with specific incidents (e.g. depredations & nuisance reports), management actions (e.g. captures, translocations & initial releases) and pack activities (e.g. denning, predation & mortalities). The re-introduction project utilizes standard VHF radio collars as well as various types of GPS radio collars. We conduct an end-of-year population count every year. The minimum population count at the end of 2013 was 83 wolves; our 2014 population count will be announced in February 2015.

Major difficulties faced

- Local community opposition to Mexican wolf re-introduction and recovery.
- Communication with the public about our goals for Mexican wolf recovery.
- Regulatory constraints related to our 1998 experimental population regulations, especially as related to adequate habitat in which we could release Mexican wolves from captivity to the wild to address genetic issues.
- Unknown consequences of limited genetic diversity. Inbreeding depression has been documented in the captive and experimental populations. Active management of the captive population minimizes the risk of inbreeding depression to the extent possible, but inbreeding depression has the potential to decrease the fitness, growth rate, and genetic variation of the experimental population unless addressed by appropriate management actions (i.e. release of unrelated wolves from the captive population).

Major lessons learned

- We have successfully established a wild population of Mexican wolves in the MWEPA. In 2013, the minimum population count was 83 with all Mexican wolves wild born; some of these Mexican wolves are at least 4th generation wild wolves. This experimental population originated from 7 founders that were used to establish a bi-national captive-breeding program. Releasing naïve wolves from captivity into the wild is much more difficult and time intensive, due to management of nuisance behaviors, than translocation of wild wolves from one area to another. Releases continue to be necessary to augment the genetics of the wild population. Our preferred release methodology has been adult wolves with young pups, with the pups serving to "anchor" the adults to the release area, enabling the supplemental feeding of the pack until successful hunting is documented. We have found that the experience gained in the wild allows for these same animals to be more successful in subsequent release events. In the future, we are likely to transition to more cross fostering of captive pups into wild dens to assist in achieving the genetic variation desired, reducing the nuisance issues often associated with the release of captive wolves.
- Adaptive management is needed to balance the release of captive wolves and removal strategies to address livestock depredations and nuisance behavior to maintain a growing population. Overly restrictive and prescriptive rules and protocols requiring removal of Mexican wolves due to depredations or nuisance behaviors that do not allow for consideration of the status of the population will not allow for sustained population growth.
- Dispersal distance and suitable habitat should be considered when establishing areas of occupancy. Limiting the geography of where animals can be released and where animals can disperse to and occupy create a scenario of limited population growth and management flexibility.

Success of project

Highly Successful	**Successful**	Partially Successful	Failure
	√		

Reason(s) for success/failure:

- The Mexican Wolf Recovery Program is often compared to wolf re-introduction efforts in the Northern Rocky Mountains. However, several important differences exist. In the Northern Rocky Mountains, wild wolves were captured in Canada and re-introduced into Yellowstone National Park and the central Idaho Wilderness - both large swaths of land largely absent of cattle. In the southwest, there are no other populations of Mexican wolves, so we have relied on captive raised wolves for release onto national forest service lands, most of which are grazed upon by cattle. In the face of these challenges, we have established a population of Mexican wolves, and at the end of 2013 all Mexican wolves documented in the wild were wild born, demonstrating that we were able to establish a wild population from captive-released animals.

Releasing Mexican wolves to the wild © USFWS

- The 1998 Final Rule restricted the area where Mexican wolves could be released from captivity and further restricted the area where wolves were allowed to disperse and occupy. A Final Rule published in 2015 greatly expands the area in which releases can occur, as well as the area wolves can disperse to and occupy. The changes provided in the 2015 Final Rule should allow for this population to grow to 300 - 325 Mexican wolves, better enabling it to contribute to the overall recovery of the Mexican wolf.
- The captive-breeding program has rigorously managed the captive population to minimize the loss of genes and produce animals for re-introduction. The wild population has fewer founder genome equivalents, less gene diversity, higher mean inbreeding coefficient, and greater population mean kinship when compared to that of the captive population. All of these genetic parameters can be positively affected by the re-introduction of captive wolves to the wild.
- The lack of an updated recovery plan results in difficulty communicating our objectives with the public and our partners. The 1982 Mexican Wolf Recovery Plan did not contain recovery criteria.
- The politics of wolves often causes difficulties in our partnerships.
- Predator re-introductions tend to be controversial with the public and local governments; the Mexican wolf program engenders strong pro- and anti-wolf sentiments that play out in the press, community meetings, and during one-on-one interactions with landowners. Litigation against the program has increased in recent years, which often impedes our ability to move forward with recovery implementation.

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