Red Wolf Recovery Program

Photo credit: Jeffrey Mittelstadt

2nd Quarter Report

January – March 2012

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www.fws.gov/redwolf

trackthepack.blogspot.com

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The Red Wolf Recovery Program

The red wolf (*Canis rufus*) is one of the most endangered canids in the world. Once occurring throughout the eastern and south-central United States, red wolves were decimated by predator-control programs and the loss and alteration of habitats. By the 1970s, these activities had reduced the red wolf population to a small area along the Gulf coast of Texas and Louisiana. To protect the species from extinction, the U.S. Fish and Wildlife Service initiated efforts to locate and capture as many red wolves as possible for the purposes of establishing a program to breed the species in captivity and one day reintroduce the species into a portion of its former range. More than 400 canids were captured in coastal areas of Texas and Louisiana, but only 17 were identified as pure red wolves. Fourteen of these wolves would become the founding members of the captive-breeding program and the ancestors of all red wolves existing today.

The first litter of red wolves born in captivity occurred in 1977. Within a few years red wolves were successfully reproducing in captivity, allowing the U.S. Fish and Wildlife Service to consider reintroducing the species in the wild. In 1987, four male-female pairs of red wolves were released in Alligator River National Wildlife Refuge (ARNWR) in northeastern North Carolina and designated as an experimental population. Since then, the experimental population has grown and the recovery area expanded to include four national wildlife refuges, a Department of Defense bombing range, state-owned lands, and private lands, encompassing about 1.7 million acres.

Adaptive Management

The recovery and restoration of red wolves requires the careful management of eastern coyotes (*C. latrans* var.) and occasionally wolf-coyote hybrids in the red wolf recovery area. The non-native coyotes spread across North Carolina to the red wolf recovery area in the early to mid-1990s. It soon was recognized that interbreeding between red wolves and eastern coyotes would produce hybrid offspring resulting in coyote gene introgression into the wild red wolf population, and that this introgression would threaten the restoration of red wolves. An adaptive management plan was developed to reduce interbreeding and introgression while simultaneously building the red wolf population. The adaptive management plan effectively uses techniques to capture and sterilize hormonally intact coyotes via vasectomy or tubal ligation, then releases the sterile canid at its place of capture to act as a territorial "placeholder" until the animal is replaced by wild red wolves. Sterile coyotes are not capable of breeding with other coyotes, effectively limiting the growth of the coyote population, nor are they capable of interbreeding with wild red wolves, limiting hybridization events. In addition, the sterile canid will exclude other coyotes from its territory. Ultimately, the placeholder canids are replaced by the larger red wolves either naturally by displacing the coyote or via management actions (e.g., removal of the coyote followed by insertion of wild or translocated wolves). Coyotes that are captured on private property are euthanized at the landowner's request.

Currently, adaptive management efforts are making progress in reducing the threat of coyotes to the red wolf population in northeastern North Carolina. Other threats, such as habitat fragmentation, disease, and anthropogenic mortality, also are of concern in the restoration of red wolves. Efforts to reduce these threats are presently being explored.

Program Objectives

The current recovery plan (U.S. Fish and Wildlife Service, 1990) specifies the following objectives:

1) Establish and maintain at least three red wolf populations via restoration projects within the historic range of the red wolf. Each population should be numerically large enough to have the potential for allowing natural evolutionary processes to work within the species. This must be paralleled by the cooperation and assistance of at least 30 captive-breeding facilities in the United States.
2) Preserve 80% to 90% of red wolf genetic diversity for 150 years.
3) Remove threats of extinction by achieving a wild population of approximately 220 wolves and a captive population of approximately 330 wolves.

4) Maintain the red wolf into perpetuity through embryo banking and cryogenic preservation of sperm.

The Red Wolf Population

We estimate between 90 and 110 red wolves in the Red Wolf Recovery Area, but for the purposes of this report all population figures are comprised only of known canids (i.e., those that are regularly monitored through either a functioning radio-collar or surgically implanted abdominal radio transmitter). Additional wolves are likely present, but have not been captured/radio-collared or their continued presence otherwise confirmed.

Beginning with the first quarter of the fiscal year 2012 (FY12) we have changed the way we report population and pack numbers. This change more accurately represents the managed population of canids that are part of our efforts to restore red wolves. The managed population includes wolf packs (i.e., packs consisting entirely of wolves) and mixed packs (i.e., packs of a wolf and coyote pair). A pack is defined as at least two known canids cooperatively inhabiting an established territory.

Population and Territory Status

A total of 77 known red wolves occupied the Red Wolf Recovery Area (i.e., 1.7 million acres in five counties in northeastern North Carolina) at the end of the second quarter of our fiscal year 2012 (FY 12). The population includes 15 wolf packs (comprised of 53 wolves and 13 breeding pairs), and 10 mixed packs (comprised of 10 wolves and 10 coyotes). An additional 14 wolves are not known to be associated with a pack. A total of 58 sterile coyotes were monitored in the Red Wolf Recovery Area at the end of this quarter.

Pairings

One breeding pair of red wolves was lost and three wolf pairs were formed during the quarter. The breeding pair loss happened when the breeding male left his territory and mate, and formed a new pair with a neighboring female wolf.

Five new mixed pairs (wolf-coyote) were reported during the quarter when program biologists were able to capture, sterilize, and release five coyotes that had previously paired with single wolves with established territories.

Two captured red wolves (1 male, 1 female) were placed together in a soft-release acclimation pen in February in an attempt to form a new pair. Their release is planned for early April.

Captures and Radio Telemetry Marking

Thirty-six red wolves were captured during the quarter, 18 of which were first-time captures. All captured wolves were fitted or re-fitted with radio-telemetry collars (VHF or GPS) or surgically implanted with abdominal radio transmitters. All but three of the wolves (1 male, 2 females) were released. The two females are being temporarily held to administer pregnancy tests, and one female was paired with the male and placed in a soft-release acclimation pen. These three wolves are scheduled to be released in early April. Captured red wolves consisted of 22 males and 14 females; 11 adults (> 2 years of age), nine juveniles (1-2 years of age), and 16 pups (< 1 year of age).

Twenty-six coyotes were captured and released during the quarter, 20 of which were first-time captures. The first-time captured coyotes were sterilized before being radio-collared and released. The other six coyotes were previously sterilized; their radio collars were replaced before release. Two of the six coyotes were recaptures in which we had lost contact; therefore, they were not included in the previous quarter's count. Captured coyotes consisted of 11 males and 15 females.

Dispersals and Displacements

One known juvenile male wolf dispersed from his natal territory during the quarter.

Two sterile coyotes (1 male, 1 female) were displaced from their respective territories by a male and female wolf during the quarter.

Mortalities

One male wolf from the Red Wolf Recovery Area is known to have died during the quarter. He was struck by a vehicle.

Four sterile, radio-collared coyotes also were known to have died during the quarter. Two of the deaths were the result of gunshot, and one death was the result of vehicle collision. The cause of death could not be determined for one of the coyotes. Two of these four coyotes had not been listed in the previous quarter's population count; one had been lost to contact before it was discovered dead, the other was a new capture in the current quarter before being struck by a vehicle.

Disappearances

The Red Wolf Recovery Program lost radio contact with six wolves (4 males, 2 females), and three coyotes (3 females) during the quarter.

Pack Summaries

The Pack Summaries *section has been indefinitely discontinued due to recent events and current circumstances involving the apparent illegal take of red wolves within the Red Wolf Recovery Area.*

Collaborations

Research

The Red Wolf Recovery Program provided financial and in-kind support for collaborative research with scientists at other institutions, including universities, interagency divisions, and non-government research organizations. These investigations required project staff to assist outside researchers and graduate students in their efforts to better understand red wolf ecology, ecosystem function, and conservation efforts.

Project Title: Prevalence of cystic endometrial hyperplasia and its effect on reproduction in the red wolf.
Graduate Student: n/a
Committee Chair/Principal Investigators: Kadie Anderson, DVM, Point Defiance Zoo & Aquarium

Project Title: Inbreeding and mate choice in wild red wolves.
Graduate Student: Kristin Brzeski (PhD student)
Committee Chair/Principal Investigator: Sabrina Taylor, PhD, Louisiana State University

Project Title: Evaluation of reproductive function in female red wolves following contraception with Deslorelin or Deslorelin and MGA.
Graduate Student: n/a
Committee Chair/Principal Investigators: Karen Goodrowe-Beck, PhD, Point Defiance Zoo & Aquarium

Project Title: Identifying management procedures to reduce red wolf-coyote interactions in eastern North Carolina.

Graduate Student: Joseph Hinton (PhD student)
Committee Chair/Principal Investigator: Michael Chamberlain, PhD, University of Georgia

Project Title: Use of stable isotope analysis to elucidate predation patterns of sympatric canids.
Graduate Student: Anne-Marie Hodge (MS student)
Committee Chair/Principal Investigator: Brian Arbogast, PhD, University of North Carolina at Wilmington

Project Title: Red wolf conservation and deer hunting: the struggles and the common ground.
[This project is part of a master's thesis creating a nonprofit (WildSides.org) that develops interactive, dynamic and internet-based documentaries about human/wildlife conflict providing a forum for ongoing learning, discussion and collaboration.]
Graduate Student: Jeffrey Mittelstadt (MA student)
Committee Chair: Penny Abernathy, MBA, MS, Knight Chair in Journalism and Digital Media Economics, School of Journalism and Mass Communication, University of North Carolina at Chapel Hill

Project Title: Evaluating potential effects of widening US Highway 64 on red wolves, Washington, Tyrrell, and Dare Counties, North Carolina.
Graduate Student: Christine Proctor (PhD student)
Committee Chair/Principal Investigator: Michael R. Vaughan, PhD, Virginia Polytechnic Institute and State University (Virginia Tech)

Project Title: Sperm morphology and motility of the red wolf (*Canis rufus*).
Graduate Student: n/a
Committee Chair/Principal Investigators: Albrecht Schulte-Hostedde, PhD, Laurentian University, and Gabriela Mastromonaco, PhD, Toronto Zoo

Publications

The following publications have gone to print in this quarter. A complete list of publications related to red wolves can be found at http://www.fws.gov/redwolf/biblio.html.

Beeland, T.D. 2012. Night-hunting coyotes in N.C. risky for red wolves. Scientific American. [published online March 27 at http://blogs.scientificamerican.com/guest-blog/2012/03/27/night-hunting-coyotes-in-n-c-risky-for-red-wolves/].

Hutt, C. 2012. Song of the south: restoring and protecting America's 'other wolf.' Wolf Print 45:16-18.

Schmitt, E. and S. Wallace. 2012. Shape change and variation in the cranial morphology of wild canids (*Canis lupus*, *Canis latrans*, and *Canis rufus*) compared to domestic dogs (*Canis familiaris*) using geometric morphometrics. International Journal of Osteoarchaeology [early publication online at http://onlinelibrary.wiley.com/doi/10.1002/oa.1306/abstract].

Sparkman, A.M., J.R. Adams, T.D. Steury, L.P Waits, D.L. Murray. 2012. Evidence for a genetic basis for delayed dispersal in a cooperatively breeding canid. Animal Behaviour [early publication online at http://www.sciencedirect.com/science/article/pii/S0003347212000747].

Stoskopf, M. 2012. Carnivore restoration. In L. Boitani and R.A. Powell (Eds.), Carnivore Ecology and Conservation. Oxford University Press.

Presentations

Bohling, J.H. 2012. The impacts of hybridization on wildlife conservation: the case of the red wolf. Invited Seminar, School of Forest Resources, Penn State University. January, State College, Pennsylvania.

Hinton, J.W. 2012. Coyote space use and habitat selection in eastern North Carolina. Warnell School of Forestry and Natural Resources Graduate Student Symposium, February 16, Athens, Georgia.

Hinton, J.W. 2012. Coyote in the southeast; research and management. Conservation Volunteer Program, Marine Corps Base Quantico, March 17, Quantico, Virginia.

Staff and Volunteers

The Red Wolf Recovery Program employs eight full-time staff, including the program coordinator, four wildlife biologists, a biological technician, a public affairs/outreach coordinator, and an administrative assistant. The public affairs/outreach coordinator and administrative assistant positions are currently vacant. The Red Wolf Recovery Program also benefits from an unpaid intern (Caretaker).

Outreach

Staff from the Red Wolf Recovery Program conduct presentations and attend events to inform and educate the public on the conservation needs of the red wolf and the restoration efforts of the Red Wolf Recovery Program. As part of our effort to assist educators, red wolf "discovery boxes" that include materials about the red wolf are distributed to educational facilities. The distribution of discovery boxes is managed by the Red Wolf Coalition (see Partnerships). Requests for discovery boxes should be made to kwheeler@redwolves.com.

The Red Wolf Recovery Program also seeks to achieve a quality visitor and participant experience in the U.S. Fish and Wildlife Service's priority recreational uses on National Wildlife Refuges. Our outreach efforts focus on four of the six program elements, including wildlife observation, wildlife photography, environmental education, and interpretation, and are conducted frequently in partnership with ARNWR and PLNWR educators and volunteers.

Presentations

Date	Location	Audience	Length	Attendance	Presenter
February 4	Hyde County	Hyde County Hunters (Youth Hunt Day)	4 hrs	~250	C. Lucash F. Mauney
March 28	ARNWR	Outer Banks Visitors Bureau	2 hrs	6	D. Rabon

Howlings

Date	Location	Event	Length	Attend	Presenter
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Website / Social Media

Information on the red wolf and the Red Wolf Recovery Program can be found on our website at www.fws.gov/redwolf.

The Red Wolf Recovery Program also maintains several social media sites. Our Facebook page (www.facebook.com/redwolfrecoveryprogram) connects our program with "friends" from around the world and informs them of the conservation efforts of the Red Wolf Recovery Program. Using Twitter, the Red Wolf Recovery Program connects with our "followers" by providing real-time information about all things red wolf. Follow us on Twitter at www.twitter.com/redwolfrecovery. Users can view and download high

resolution pictures related to red wolves and the Red Wolf Recovery Program on our Flickr page (www.flickr.com/photos/trackthepack). Lastly, discover, watch, and share videos of red wolves on our YouTube site (www.youtube.com/trackthepacktube).

The Red Wolf Recovery Program also has a weblog that highlights the efforts of the Red Wolf Recovery Program staff in the conservation of the red wolf. The weblog combines text, images, videos, and links to other media related to its topic. The content includes educational, informational, and general journal entries written by program staff, and allows readers to leave comments in an interactive format. The weblog can be found at trackthepack.blogspot.com.

Media Inquires

The Red Wolf Recovery Program responded to numerous media inquiries during this quarter, mainly on the issue of the proposed rule by the North Carolina Wildlife Resources Commission to allow the hunting of coyotes at night. Media inquiries came from the journalists and science writers associated with Scientific American, Fayetteville Observer (Fayetteville, NC), Daily Reflector (Greenville, NC), Charlotte Observer (Charlotte, NC), News and Observer (Raleigh, NC), and National Public Radio (Chapel Hill, NC). Publications associated with these inquiries can be found reposted on our Facebook page and blog.

Partnerships

Species Survival Plan (SSP)

Species Survival Plan (SSP) captive facility coordination is based at Point Defiance Zoo & Aquarium (PDZA) in Tacoma, Washington. The SSP currently coordinates 41 captive red wolf sites at zoos and nature centers housing about 166 wolves. The following information is based on activities completed or conducted by the SSP Coordinator during the quarter reported. Additional information on the SSP can be found at redwolfssp.org.

The SSP Coordinator reported numerous correspondence and communications regarding red wolves, including coordinating the transfer of wolves to North Carolina State University as an SSP approved facility, providing a letter of support to the Endangered Wolf Center's (Eureka, MO) Conservation through Literacy campaign, and encouraging SSP cooperators to comment on the North Carolina Wildlife Resources Commission's proposal to allow the hunting of coyotes at night. The SSP Coordinator also completed AZA surveys related to SSP and field conservation and animal program sustainability, and provided input to AZA Population Management Center for survival statistics. Lastly, the SSP coordinator responded to a number of researchers inquiring about red wolf related issues and research, such as Progressive Retinal Atrophy (PRA), supernumary dentition, pup fostering, and founding-line survival.

For the quarter, the SSP Coordinator reported attending a meeting on gamete banking at St. Louis Zoo (St. Louis, MO), completing and distributing the 2011 studbook, submitting an application for export permit to provide additional samples for study (Laurentian University and Toronto Metro Zoo) to evaluate the effects of inbreeding on several sperm morphology parameters, completing reproductive ultrasound examinations on female wolves in conjunction with a study (PDZA) to evaluate the prevalence of cystic endometrial hyperplasia in a subset of the SSP population of red wolves, and completing blood sera collection for vaccine titer study.

Island Propagation Sites

The U.S. Fish and Wildlife Service utilizes island sites to propagate red wolves and contribute to the restoration of a wild red wolf population, primarily by inserting island-born wolves into the wild population as a means to augment the wild red wolf gene pool with "under-represented" genes from the captive population. Currently, the Red Wolf Recovery Program cooperates with St. Vincent National Wildlife Refuge in maintaining a breeding pair of red wolves on an island site.

Red Wolf Coalition

The Red Wolf Coalition (RWC), a non-profit education organization based in Columbia, NC, advocates for the long term survival of wild red wolf populations by teaching about red wolves and by engaging the public in red wolf conservation. The RWC's web site (www.redwolves.com) provides information about the history, biology, and ecology of red wolves, as well as news about red wolf restoration. The RWC gives red wolf programs to school groups, professional organizations, university students, and other groups. The RWC also conducts workshops for teachers and non-formal educators, including people seeking certification in environmental education.

The RWC reports that preliminary construction of the grounds around the red wolf viewing facility at PLNWR in Columbia, NC has begun. Construction of the red wolf viewing facility and enclosures is expected to begin in April. In addition, the RWC Executive Director reported that the RWC and General Mills Corporation (Minneapolis, MN) are working together on fundraising, branding, and expanding the reach and effectiveness of the organization. The RWC Executive Director also met with the Marketing Director of North Carolina State University to explore educational opportunities at university sporting events.

The RWC and NC Museum of Life and Science (Durham, NC) are co-sponsoring the "Wolves and Wild Lands in the 21st Century" exhibit which will open to the public at the museum in April. The exhibit will highlight wolves and their struggle to survive, the cultural and economic pressures which continue to shape their existence, and the challenges that wolves and people face coexisting in the same place. This visually captivating exhibit features six canid specimens - five wolves and a coyote. Information about the exhibit can be found at http://www.ncmls.org/visit/events/wolves-wild-lands.

The RWC Executive Director reported conducting several education programs during the quarter, including a presentation at PLNWR to a group of 15 people from the North Carolina Museum of Natural Sciences; a presentation in Plymouth (NC) to 20 students from Exploris School (Raleigh, NC); and, participating in a conference call about red wolves with 3rd graders from Windsor Elementary School (Windsor, VA). The RWC Executive Director also presented statements in opposition of the North Carolina Wildlife Resources Commission's proposal to allow the hunting of coyotes at night at two public hearings held in March.

The RWC also has three Red Wolf Discovery Boxes for all grade levels. These boxes are filled with a variety of hands-on items, activities and artifacts that help students explore the world of red wolves. The red wolf curriculum *Far Traveler* and a variety of books and other resources also are included. Contact Kim Wheeler at 252-796-5600 or kwheeler@redwolves.com for more information or to reserve your Red Wolf Discovery Box.

Announcements

The Red Wolf Recovery Program congratulates Justin McVey for successfully defending his thesis and completing his M.S. degree in Fisheries, Wildlife, and Conservation Biology in the Department of Forestry and Environmental Resources at North Carolina State University. Justin's thesis is entitled "Assessing food habits of red wolves (*Canis rufus*) and coyotes (*Canis latrans*) in eastern North Carolina." Christopher E. Moorman, PhD, and David T. Cobb, PhD, served as Justin's advisors and Committee Co-Chairs.

The Red Wolf Recovery Program congratulates the following researchers for successfully competing in PDZA's Conservation Committee Grants:

- Kristin Brzeski, a PhD student at Louisiana State University, for projects entitled "Examining genetic variation in pre-Columbian red wolves" ($4000); and, "Inbreeding depression, MHC variation, and mate choice in wild red wolves" ($5000).

- Karen Goodrowe-Beck, PhD, PDZA, for her project entitled “Evaluation of reproductive function in female red wolves following contraception with Deslorelin or Deslorelin and MGA” ($5000).

- Kadie Anderson, DVM, PDZA, for her project entitled “Prevalence of cystic endometrial hyperplasia and its effect on reproduction in the red wolf” ($7487).

- Craig Standridge, PDZA, for his project entitled “2012 Red Wolf SSP Education Summit” ($1500).

The U.S. Fish and Wildlife Service is investigating the suspected illegal take of several red wolves found dead in the Red Wolf Recovery Area (Dare, Hyde, Tyrrell, Washington, and Beaufort Counties, NC). Contributions from various organizations and individuals have resulted in a reward of up to $15,000 for information directly leading to an arrest, a criminal conviction, a civil penalty assessment, or forfeiture of property on the subject or subjects responsible for the suspected unlawful take of these red wolves. The red wolf is protected under the Endangered Species Act. The maximum criminal penalties for the unlawful taking of a red wolf are one year imprisonment and $100,000 fine per individual. Anyone with information on the deaths of red wolves is urged to contact Special Agent Sandra Allred at (919) 856-4786 or North Carolina Wildlife Resources Commission Officer Robert Wayne at (252) 216-8225.