Red Wolf Recovery Program

Photo credit: Ryan Nordsven/USFWS

3rd Quarter Report

April – June 2012

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www.fws.gov/redwolf

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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 100 and 120 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 75 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 third quarter of our fiscal year 2012 (FY 12). The population includes 15 wolf packs (comprised of 51 wolves and 13 breeding pairs), and 8 mixed packs (comprised of 8 wolves and 8 coyotes). An additional 16 wolves are not known to be associated with a pack. A total of 52 sterile coyotes were monitored in the Red Wolf Recovery Area at the end of this quarter.

The Red Wolf Recovery Program documented nine red wolf litters (comprised of 40 pups) born in the Red Wolf Recovery Area during the 2012 whelping season. Additional pups and/or litters could be present, but have not been confirmed. Two pups born in captivity at Alligator River National Wildlife Refuge were fostered into a wild litter. Pups born during the 2012 whelping season are not included in the reported population numbers.

Pairings

One breeding pair of red wolves was lost and one pair was formed during the quarter. The breeding pair loss happened when the pair appeared to have been pushed out of their home range by a neighboring wolf pack. The wolf pair that formed was the result of management actions that included the removal of a resident female coyote, followed by holding the resident male wolf with a dispersing female wolf (from another pack) in an acclimation pen for a period of time. Upon their release in April, the pair formed a pair bond and stayed together.

Two mixed pairs (wolf-coyote) were lost during the quarter when program biologists lost contact with two coyotes (1 male, 1 female) that had previously formed pair bonds with resident wolves within their respective territories.

Captures and Radio Telemetry Marking

No red wolves were captured during the quarter.

Two captured female coyotes were sterilized, radio-collared, and released during the quarter.

Dispersals and Displacements

No known red wolf or coyote dispersals or displacements occurred during the quarter.

Mortalities

Two juvenile female red wolves from the Red Wolf Recovery Area are known to have died during the quarter. The mortality of one of the female wolves is suspected to have been the result of illegal take. The cause of mortality of the second wolf is unknown.

Four sterile, radio-collared coyotes (3 males, 1 female) also were known to have died during the quarter. Three of the deaths were the result of vehicle collision, and the fourth cause of mortality is unknown.

Disappearances

The Red Wolf Recovery Program lost radio contact with four coyotes (1 male, 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: 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: 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: 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.

Mittelstadt, J.M. 2012. North Carolina Nights: Endangered red wolves threatened by proposed coyote hunting rule. Reesenews.org. [Available online at http://vimeo.com/40360924 or http://www.youtube.com/watch?v=HOUjQSolpLI].

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 83:1091-1098.

Presentations

Mittelstadt, J.M. 2012. Reporting on and understanding stakeholders in human/wildlife conflict. College of Veterinary Medicine Seminar, North Carolina State University, April 23, Raleigh, North Carolina.

Rabon, D.R., Jr. 2012. Red wolf recovery in the Albemarle-Pamlico Region. Albemarle-Pamlico National Estuary Program's Science and Technical Advisory Committee Meeting, April 25, Raleigh, North Carolina.

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
June 28	Hyde Co.	Hyde County 4-H Summer Camp	2 hrs	90	C. Heffley K. Brick A. Early

Howlings

Date	Location	Event	Length	Attend	Presenter
April 21	ARNWR	Earth Day Howling	2 hrs	67	A. McGarry R. Marchand
May 26	ARNWR	Memorial Day Howling	2 hrs	59	C. Heffley K. Brick
June 6	ARNWR	Summer Howling	2 hrs	64	C. Heffley K. Brick A. Early
June 13	ARNWR	Summer Howling	2 hrs	85	K. Brick C. Stone
June 20	ARNWR	Summer Howling	2 hrs	86	K. Brick I. Heine
June 27	ARNWR	Summer Howling	2 hrs	62	K. Brick J. Cooley

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 on 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, including science writer DeLene Beeland (www.delene.us), who is writing a book about red wolves, and Jeffrey Mittelstadt (www.jeffmittelstadt.com), a graduate student from the University of North Carolina at Chapel Hill's School of Journalism, who is producing a number of video and mixed-media projects on red wolf restoration. Publications by these authors 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. Nine red wolf litters (comprised of 41 pups) were born in SSP cooperating facilities during the 2012 whelping season. Two pups born in captivity at Alligator River National Wildlife Refuge were fostered into a wild litter. Pups born during the 2012 whelping season are not included in the reported captive population numbers. 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 accommodate SSP institutional requests; providing vaccination and anesthesia protocols; providing information, specifications and photos on SSP approved fencing to house red wolves; a request from AZA to review a CEF proposal to investigate secondary rodenticide exposure in free-ranging red wolves; and, responding to general requests from national and international students and researchers on the status of red wolves. The SSP Coordinator assisted PhD student (LSU), Kristin Brzeski, with SPARKS output data for analysis in PMx software associated with her project entitled "Inbreeding and mate choice in wild red wolves." The SSP Coordinator also had preliminary communications with founders of Zoo Borns, a website and book series highlighting baby animals, about a new television series showcasing various in situ/ex situ conservation programs and their interest in focusing on the Red Wolf Recovery Program.

The SSP Coordinator received an application for participation in the SSP from Charles Towne Landing State Historic Site (Charleston, SC); the application was approved after review and inspection by SSP management group. The SSP Coordinator also received a request from Ecotarium Museum of Science and Nature (Worcester, MA) about possible interest in SSP participation.

The SSP Coordinator coauthored, with the Recovery Coordinator, an invited article submitted to the World Association of Zoos and Aquariums' WAZA magazine. The special edition will focus on a number of examples of interactive ex situ and in situ population management and the unique contribution zoos and aquaria have made to prevent animal extinction.

The SSP Coordinator, after a lengthy and time-consuming process, received a USFWS export permit to provide additional semen samples for study (Laurentian University and Toronto Metro Zoo) to evaluate the effects of inbreeding on several sperm morphology parameters. The SSP Coordinator also completed reproductive ultrasound examinations on female wolves in conjunction with a study being conducted by Kadie Anderson, DVM, PDZA Intern Veterinarian, to evaluate the prevalence of cystic endometrial hyperplasia in a subset of the SSP population of red wolves. Preliminary results will be presented by Dr. Anderson at July planning meeting at the NC Zoo (Asheboro, NC). Written results will be available when project is completed.

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 not-for-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 reported that construction of the red wolf viewing facility and perimeter fencing at PLNWR in Columbia, NC is completed. The RWC obtained the necessary funds for the red wolf viewing facility from the U.S. Department of Agriculture's Rural Development and from a generous gift from the North Carolina Zoological Society. The red wolf viewing facility will include several enclosures to house red wolves, including a natural environment enclosure designed to showcase red wolves to the visiting public. The facility is scheduled to open in late October 2012.

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 opened to the public at the museum in April. The exhibit highlights 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 an all-day teacher's workshop for the Far Traveler's curriculum to 20 traditional and nontraditional teachers at the North Carolina Life and Science Museum (Durham, NC) and a presentation on environmental education to a group of children from Fayetteville, NC. The RWC Executive Director also reported that the Oak Ridge Elementary School 4th graders held a fundraising for their 5th honorary red wolf adoption. The RWC and the Red Wolf Recovery Program are grateful for the hard work and enthusiasm to red wolf conservation shown by these amazing 4th grade students and teachers.

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

Kristin Brzeski, a PhD student at Louisiana State University, received an American Society of Mammalogists Grant-in-Aid award for $1500. Her proposal, entitled "Examining genetic variation in pre-Columbian red wolves (*Canis rufus*)," was ranked 5th out of 74 submitted grant proposals. Congratulations Kristin!

Jeffrey Mittelstadt successfully defended his thesis and completed his M.A. degree in Technology and Communication in the School of Journalism and Mass Communication at the University of North Carolina at Chapel Hill. Jeff's thesis is entitled "Wildsides business plan," and details the creation of a not-for-profit organization that develops interactive, dynamic, and internet-based documentaries about human-wildlife conflicts. Information on Wildsides can be found at www.wildsides.org. Penny Abernathy, MBA, MS, served as Jeff's advisor and Committee Chair. Congratulations Jeff!

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.