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Loss of wildlands
could increase
wolf-human conflicts, **PAGE 4**

A conversation about
red wolf recovery, **PAGE 8**

A Closer Look at Red Wolf Recovery

A Conversation with Dr. David R. Rabon



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BECKY BARTEL/USFWS

*EDITOR'S NOTE: In the 2010 Fall issue, International Wolf interviewed the coordinators of the two remaining endangered wolf populations—the Mexican gray wolf (*Canis lupus baileyi*) in the Southwest and the red wolf (*Canis rufus*) in the Southeast—about the challenges they face and efforts they make to save these species. In this interview, Cornelia Hutt, an educator, writer and chair of the Red Wolf Coalition, gets an update from Red Wolf Recovery Program Coordinator Dr. David R. Rabon. This interview delves deeper into the groundbreaking and unique management and conservation actions being employed to recover the critically endangered red wolf.*

Hutt: What is the current population of red wolves?

Rabon: At the end of 2012, we estimated the wild population of red wolves in northeastern North Carolina at 100–120. Approximately 65 are monitored with very high frequency (VHF) radio-telemetry collars. The rest are mainly pups born last season that we are currently capturing to check their general health and fit with radio-telemetry collars now that they have reached full size. We also have about 192 captive wolves housed at 43 zoos and nature centers throughout the United States that are partners in the Red Wolf Species Survival Plan (www.redwolfssp.org).

Hutt: In our last interview you talked about the use of adaptive management to assess, control and manage hybridization between red wolves and coyotes. Can you review the purpose and importance of adaptive management?

Rabon: The concept of the Adaptive Management Plan (Plan) was developed about 12 years ago following a facilitated workshop by the Conservation Breeding Specialist Group of the International Union for Conservation of Nature's (IUCN) Species Survival Commission. The purpose of the Plan was to develop

a way to reduce interbreeding between red wolves and eastern coyotes (*Canis latrans* var.) while simultaneously building the wild red wolf population.

Hutt: How does the Adaptive Management Plan work in controlling hybridization or increasing the wild red wolf population?

Rabon: The Plan specifies the framework and general goals of controlling hybridization between red wolves and coyotes while outlining continuing efforts to restore red wolves to northeastern North Carolina. Additionally, it retains the flexibility to adapt to new findings, either from the analysis of the data collected during implementation or from research findings. Through the combined use of field data and population-simulation models, the Red Wolf Recovery Program can assess the Plan's progress and recommend changes as necessary. In practical terms, the Plan advocates techniques to capture and sterilize a hormonally intact coyote and release the sterile animal back into its territory. Because sterile coyotes cannot breed, this method limits the growth of the coyote population within the red wolf recovery area and restricts hybridization between coyotes and red wolves.

Hutt: How was the sterilization technique developed?

Rabon: Decades have been spent trying to remove coyotes to protect domestic livestock from predation. However, such efforts are often problematic and produce inconsistent results. Because coyotes are territorial and typically kill domestic animals to feed their pups, researchers began testing whether surgically sterilized, but hormonally intact, coyotes could function to protect livestock by defending space against other coyotes. It is this concept of holding space that is being applied to manage hybridization between red wolves and coyotes by providing managers time, information and a higher degree of control over the recovery landscape while providing a reproductive advantage to the red wolf. Ultimately, sterilization allows territorial space to be held until the sterile animal can be replaced naturally by a red wolf or with the assistance of management actions.

Hutt: It's obvious that sterilization precludes reproduction, but can you elaborate on how exactly a coyote holding space helps the red wolf?

Rabon: The underlying tenet of the Plan is that space—and therefore canid territories—is limited within the red wolf recovery area in northeastern North Carolina. Given a small, reintroduced red wolf population, that space is initially best occupied by breeding pairs of red wolves, non-breeding mixed (red wolf-coyote) pairs, or non-breeding coyote pairs. By sterilizing coyotes, infiltration of non-wolf genes will be controlled and territories will be unavailable for colonization by breeding coyotes or red wolf-coyote pairs. As the red wolf population grows, having space available for dispersing red wolves becomes increasingly important, and this space is

As a Matter of Fact: The Red Wolf

Scientific name: *Canis rufus* **Common name:** Red wolf

Physical characteristics: Weight 45–80 pounds (23–36 kilograms). Long legs, slender body, height at shoulder about 26 inches (68 centimeters). Color varies from dark gray to gray mixed with cinnamon, buff, tan and black with creamy underbelly. Often has reddish traces on its long ears and backs of legs.

Original range: Once the Southeast's top predator, the red wolf was found from the Atlantic and Gulf Coasts, north through the Ohio River Valley, through central Pennsylvania and New York and west to southern Missouri and central Texas.

Present range: Lives in the wild only in the 1.7-million-acre (680,000 hectares) restoration area in northeastern North Carolina. Recovery plan calls for two additional reintroduction sites.

Endangered Species Act status: endangered/nonessential experimental.

Prey: Primarily white-tailed deer, nutria, marsh rabbits, raccoons and small rodents.

Social structure: Lives in family groups or pairs (packs). Often hunts alone or in pairs.

Reproduction: Breeding season is February and March. Average litter is three to five pups born each year in April and May.

provided through natural interspecific competition and/or management actions.

Hutt: Does sterilizing the coyote affect its behavior or its ability to maintain its territory?

Rabon: It doesn't appear so. Studies have shown that sterilization reduces the predatory rate of coyotes associated with pup production and the provisioning of pups. However, sterilization had no effect on coyote territorial behaviors, compensatory reproduction (i.e., an increase in the number of offspring produced to compensate for the loss of individuals not reaching reproductive age as a result of ecological or social constraints) or other behavioral components of coyote social ecology.

Hutt: Does sterilization have any effect on the coyote population as a whole?

Rabon: Sterilization is an efficient coyote management strategy for reducing coyote population growth. Conversely, coyote populations that are heavily exploited (i.e., hunted or reduced through other lethal removal strategies) are characterized by younger



age structure, lower adult survival rates, increased percentages of yearlings reproducing, increased litter sizes and relatively small packs. Even under the most severe removal programs, repopulation by coyotes can be expected within months to two to three years.

Hutt: Doesn't leaving coyote pairs or red wolf-coyote pairs on the landscape prevent another wolf or wolf pair from claiming the territory?

Rabon: Sterile or "placeholder" coyotes are naturally replaced when the larger red wolves displace or kill the coyote. However, on occasion we might remove a coyote when we can insert a wild or translocated red wolf into that territory or if we have a red wolf dispersing there. We are evaluating and analyzing our data on these interactions, but so far our findings suggest that red wolves always win over coy-

otes in territorial disputes, whether we have taken management actions or not to remove a coyote. In other words, our preliminary analyses show no instances of a coyote successfully defending a territory against a red wolf.

Hutt: It sounds as if the Adaptive Management Plan is working and buying time for recovery efforts to help promote an increase in wild red wolves. But what happens when red wolves are lost? How does that affect the implementation of the Adaptive Management Plan?

Rabon: The Plan works by giving a reproductive advantage to the red wolf, which leads to an increase. In the first few years of the Plan's implementation, we saw an increase in the area occupied by red wolves, total number of red wolves and red wolf social units as well as a decrease in the total area where the status of canids,

in general, is unknown. With regard to losses in the wild red wolf population, a certain number of deaths are expected. However, when these losses approach or exceed recruitment or substantially reduce the number of available wolves to fill vacant territories, we worry that the population of red wolves could decline. A high rate of loss sustained over an extended period could lead to a population crash. But the number of losses isn't the only concern. We also look at the type of loss or period when losses are greatest to determine if the loss can be prevented or mitigated.

Hutt: We read on your Web site (www.fws.gov/redwolf) that the Red Wolf Recovery Program lost 19 wolves in 2012. That seems like a high rate of mortality for a population estimated between 100 and 120 animals. How does the number of mortalities compare to previous years?



Rabon: The overall annual number of mortalities has been relatively constant since implementing the Plan (c. 2000), ranging from 14 to 28 deaths per year with an average of 19. However, the proportion of mortality types has changed. From about 2000 to 2004, gunshots and vehicle strikes equally accounted for the highest number of deaths, followed by management actions. From 2005 to 2012, the number of wolves killed annually by gunshot nearly doubled and appears to be steadily increasing, while deaths from vehicle strikes remained at similar levels and management-related deaths have declined significantly.

Hutt: How does the loss of that many red wolves affect the sustainability of such a small population or the implementation of your management actions and fulfilling the goals of the Adaptive Management Plan?

Rabon: The death of a single red wolf can have an enormous impact on the small, wild red wolf population by disrupting the population dynamics of a pack and possibly surrounding packs and reducing the number of breeding animals and pairs. The loss of a breeding wolf and the dissolving of a breeding pair also can preclude that pack's reproduction for a year or more, reducing recruitment, and can increase opportunities for hybridization. And the effects extend beyond the loss of red wolves. The loss of sterile coyotes also impacts our red wolf recovery success because their loss increases the potential for hybridization as intact coyotes fill the empty space, which is needed for red wolves.

Hutt: What are the next steps in the recovery efforts for the critically endangered red wolf?

Rabon: There are obvious immediate needs, such as finding solutions to avoid, and control for, the unnecessary

and unnatural losses of red wolves and managed coyotes. We are taking a multi-pronged approach to resolve these issues by focusing on improving regulations and policies to protect the red wolf and implementing innovative management and conservation techniques. We work closely with the North Carolina Wildlife Resources Commission on these issues. We are also extending our reach to educate the public on the value and importance of red wolves, our efforts to recover the species and our recovery strategies and goals by connecting through various social media. Our partners, the Red Wolf Coalition and Friends of the Red Wolf, and numerous Red Wolf Species Survival Plan cooperators, greatly assist in these efforts. We continue to assess the effectiveness of, and make informed decisions about, our management techniques and strategies. And we're also looking to the future. Our recovery plan calls for three separate reintroduced populations of red wolves, and we are taking the steps to make those populations a reality. Partners will play an intricate roll in our success to recover the red wolf. Therefore, we are invigorating old relationships and forging new partnerships to help us deal with the challenges that lie ahead. ■

Dr. David R. Rabon, coordinator of the U.S Fish and Wildlife Service's Red Wolf Recovery Program, is a conservation biologist with a Ph.D. from North Carolina State University, where he studied factors affecting social and reproductive behaviors of red wolves.

