



Red Wolf Biology and Status

The red wolf (*Canis rufus*) is distinguished from the gray wolf (*Canis lupus*) and the coyote (*Canis latrans*) by size and coloring. Intermediate in size between coyotes and gray wolves, red wolves average 50-80 pounds. They are mostly brown and buff colored, often with the signature red shading around their ears, muzzle and the backs of their legs. Red wolves are known to hunt individually and in packs, eating white-tailed deer (50% of their diet), raccoons and small mammals such as marsh rabbits and rodents. They have also been known to prey on domestic pets and livestock, but in very small numbers. Similar to gray wolves, red wolves live in the social structure of a pack comprised of a breeding pair and older offspring that assist with pup rearing. Red wolves are territorial just as gray wolves are, and evidence demonstrates that they interbreed with coyotes only when they cannot find a red wolf mate.

The origin of the red wolf remains an enigma, and scientists do not universally agree on whether the red wolf is indeed a separate species, a subspecies of the gray wolf, or hybrid between gray wolves and coyotes. However, based on years of research and data supporting the uniqueness of this predator, the U.S. Fish and Wildlife Service has legally designated the red wolf, *Canis rufus*, a distinct species. Petitions to delist the red wolf on grounds that it is a hybrid have been defeated, and *Canis rufus* remains a protected species under federal law in the United States.

To further complicate the issue, work on wolves in Algonquin Provincial Park, Ontario, Canada suggests that wolves there are closely related to the red wolf. Some researchers working in the Park argue that the red wolf (*Canis rufus*) and the eastern timber wolf (*Canis lupus lycaon*) should be joined as a species (*Canis lycaon*), separate from the gray wolf. The debate is likely to continue for some time.

Regardless of its exact taxonomic designation, the red wolf is an animal with unique characteristics, one that adds to the overall biodiversity of our wildlands. Under the Endangered Species Act, red wolves are considered endangered and are classified as experimental and nonessential in the five-county recovery area on the Albemarle Peninsula

in northeastern North Carolina. This designation minimizes the infringement on private landowner rights, yet provides managers the important tools to restore and manage the species.

A model for the reintroduction of a major predator, the red wolf restoration project in the southeastern United States has differed from gray wolf restoration projects in the western states. Unlike gray wolves, red wolves face an imminent threat of extinction. No wild populations of red wolves exist outside the restoration area in northeastern North Carolina.

Until the 1987 reintroduction of red wolves on North Carolina's Albemarle Peninsula, biologists had not studied red wolves in the wild. Options for additional red wolf release sites are limited due to the dense human population of eastern states and the lack of large tracts of undeveloped lands within the red wolf's historical range. Additionally, coyotes now occupy every region east of the Mississippi River.

The red wolf was once well established as a top predator throughout the Southeast. Its original range is believed to be the entire eastern forested region of North America from southeastern Canada to the Gulf Coast. By 1920 the red wolf had been extirpated in most of the southern states, and by 1970 fewer than 100 red wolves remained in the entire United States, all of them confined to a small area of marginal habitat in coastal Texas and Louisiana. Early bounties and indiscriminate killing caused the rapid decline of red wolf numbers. Loss of habitat perpetuated this decline in the mid-1900s as people cleared land for roads, livestock, agriculture, logging and mining.

Early efforts to save the red wolf focused on preserving and expanding the remaining wild red wolf population. However, as red wolf numbers spiraled downward, coyote populations expanded eastward and established a foothold in areas that had been dominated by wolves. When the few remaining red wolves failed to find mates of their own species, many mated with coyotes, a phenomenon known as "hybrid swarm." As this hybridization increased, the number of genetically pure red wolves decreased, further accelerating the decline of the red wolf. As a result, recovery efforts shifted in focus to capturing red wolves and breeding them in captivity, with a goal of future reintroduction. By 1980 the last known red wolf had been captured, and the species was declared functionally extinct in the wild.

Captive breeding under the red wolf Species Survival Plan (SSP) has since preserved genetically pure red wolves. This plan paved the way for the captive breeding of Mexican gray wolves (*Canis lupus baileyi*), another critically imperiled wolf. The red wolf recovery plan's goal is to establish and maintain 330 genetically pure wolves in captivity and 220 wolves in the wild, within at least three self-sustaining wild populations.

With successful breeding, captive animals were first released in the Alligator River National Wildlife Refuge (ARNWR) in northeastern North Carolina in 1987. ARNWR was an ideal site

for reintroduction because it is surrounded on three sides by large bodies of water and holds low densities of humans, livestock and coyotes. These factors minimized concerns over wolf predation on livestock and cross-breeding with coyotes. Within their first year in ARNWR the wolves successfully produced their first litter of pups in the wild. By 1993 captive wolves had also been successfully released in the Pocosin Lakes National Wildlife Refuge in North Carolina and Great Smoky Mountains National Park in Tennessee, and on three island propagation sites off the Atlantic and Gulf Coasts.

Reintroduction in northeastern North Carolina has been a success, with a current population of more than 100 free-ranging wolves. Efforts to sustain a wild population in the Great Smoky Mountains National Park, however, were less successful. Low to almost non-existent pup survival prevented the released wolves from establishing and expanding home ranges and developing family groups within park boundaries. Biologists suspected disease, such as parvovirus, predation, malnutrition, and parasites as contributing factors to the unsuccessful reintroduction effort. Reintroducing red wolves in the Park was controversial from the start because of bordering livestock operations. Red wolves were responsible for depredation of a few calves on a lease operation within the Park. Additionally, white-tailed deer live principally in the lower elevations, not in the old-growth forest of the Park. The wolves were regularly seen on the outskirts of residential areas and in the neighboring national forests. Twenty-six of the 37 red wolves released in the Great Smoky Mountains between 1992 and 1996 died or were recaptured after straying outside of park boundaries onto private lands and national forests. In October of 1998, the U.S. Fish and Wildlife Service and the National Park Service announced plans to recapture all red wolves that remained in the Park and relocate them to northeastern North Carolina, ending efforts to restore red wolves in the Great Smoky Mountains. Horn Island off the coast of Mississippi was removed from the island propagation program that same year because of increasing probability of wolf interactions with humans.

Other red wolves have been released on islands in the Atlantic and along the Gulf Coasts as steppingstones between captivity and the wild. Although these islands are not large enough to provide for the needs of more than a few red wolves at a time, they provide the opportunity for them to breed and exist in the wild in order to produce animals for future mainland reintroductions. A handful of red wolves reside at one island propagation site (St. Vincent's National Wildlife Refuge off the coast of northern Florida). At least 281 pups have been born in the wild at propagation site over four generations since the program's inception in 1987.

Today, due to an aggressive preservation effort mandated by the Endangered Species Act, red wolf numbers are slowly rising, and the wolves again roam wild through a small portion of their historical range in northeastern North Carolina. Seventy-five percent of the approximately 130 wolves in the wild are radio-collared and tracked. Pup survival rate is good, and field biologists monitor dens each spring. Pup fostering, a technique involving the insertion of captive-born pups into the dens of wild parents, has been remarkably successful. In addition to increasing the number of pups in the wild, new genes from the

captive population are infused into the wild population. Approximately 182 red wolves reside in 42 captive breeding facilities throughout the country.

The future of the red wolf is not yet secure. More than half the population exists in captivity, and efforts to find two additional reintroduction sites face challenges in the Southeast, a region with a robust coyote population. Although red wolf packs are territorial and defend their territories against invasive coyotes, the tendency of unpaired red wolves to breed with coyotes is a management issue. Gunshot mortality is a grave concern. Young red wolves resemble coyotes, and in November when hunting season begins, an alarming number of breeders are killed. The U. S. Fish and Wildlife Service Red Wolf Recovery Program and the Red Wolf Coalition partner to teach the public about the value of conserving this rare predator and the habitat it needs to thrive. Two major goals are to work with stakeholders and with the North Carolina Wildlife Resource Commission on red wolf issues. Additionally, plans are underway to build a large, natural-habitat enclosure for a resident group of wolves so that people can see a red wolf and make the essential connection with this critically endangered animal.