

# Habitat Conservation Planning Helps Conserve the Alabama Beach Mouse and its Habitats

William Lynn

GUEST EXPERT

The Alabama beach mouse is a nocturnal small mammal that might be extinct by now except for conservation of its habitat under Habitat Conservation Plans (HCPs). The Alabama beach mouse lives in the sand dunes of Alabama's coast where it builds complex burrows. It is a monogamous small mammal, a rare trait found in only three percent of all mammals. Dunes are a dry arid environment. A tough place to make a life. Being monogamous gives these small mammals an edge in such a tough environment.

Male and females share raising of the young. From monitoring, the U.S. Fish and Wildlife Service (the Service) has found life expectancy on average is nine months. While that is a short life, Alabama beach mice can reach reproductive maturity in as little as six weeks. Gestation is 23 days, and females can breed again within 24 hours of giving birth.

Another rare trait of the beach mouse is that it builds complex burrows. The burrows have an entrance tunnel about three feet into the sand dune, where a nest chamber is built. At the rear of the nest chamber, an escape tunnel is built that does not penetrate the surface. If a coyote, fox, or snake begins to dig into the entrance tunnel, the mouse will dig through the final parts of the escape tunnel and safely get away.<sup>1</sup>

The Alabama beach mouse's habitat is primary, secondary, tertiary, and interior scrub dunes. The Service estimated the historical range of the Alabama beach mouse included 8,000 or 9,000 acres of sand dune habitat. After total development of Alabama's coast occurs, the Service estimates between 2,300 and 2,400 acres of these types of sand dunes will remain.<sup>2</sup>

Of these dune types, tertiary dunes area is the most important habitat type for the beach mouse because they are the highest sand dunes along the coast. They are also the rarest habitat type left. In the event of a Category 3 tropical storm or higher, they will be the only dunes not inundated. Thus, they are extremely important because they serve as high hurricane refuges for the Alabama beach mouse during such a storm. Luckily, the majority of this type of habitat is in the publicly held lands, limiting development there.

At one time, the Alabama beach mouse was found on Ono Island and from the west side of Perdido Pass, Orange Beach to the tip of Fort Morgan in Gulf Shores, Alabama. Today, the range of the mouse has been reduced to an isolated population in Gulf State Park (between Orange Beach and Gulf Shores), and the core remaining population located from the west side of Little Lagoon Pass in Gulf Shores to the tip of Fort Morgan in Gulf Shores, Alabama.

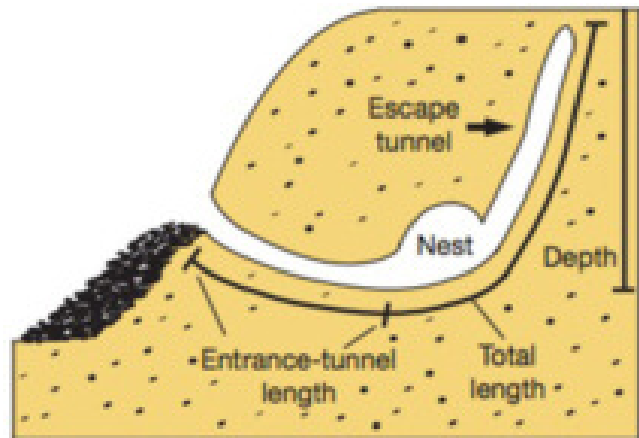


Diagram of an Alabama beach mouse burrow.

## Listing and Development of Habitat Conservation Planning

The Alabama beach mouse was listed as an endangered species in 1985 mainly due to coastal development and its associated threats. Section 9 of the Endangered Species Act (ESA) prohibits take of any fish or wildlife listed as endangered.<sup>3</sup>

Section 3 of the ESA defines "take" as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."<sup>4</sup>

In 1982 Congress recognized the need to reduce conflicts between listed species and economic development by adding an exemption for the "incidental take" of a listed species by non-Federal activities.<sup>5</sup> Incidental take is that which is incidental to, and not the purpose of, carrying out an otherwise lawful activity.

The amendment created a permitting system in which applicants can obtain an Incidental Take Permit (ITP) if an approved conservation plan is developed. These plans are

commonly known as Habitat Conservation Plans. Among other requirements, the plan must specify the impacts that are likely to result from the taking, the measures the applicant will undertake to minimize and mitigate such impacts and funding that will be available to implement such measures. Section 10(a)(2)(A) of the ESA sets the statutory criteria that must be satisfied before an ITP can be issued. Once the permit is issued, the permittee must implement all portions of the plan. Permits for HCPs are typically issued for a 50-year time period and can be renewed.<sup>6</sup>

### Habitat Conservation Planning and the Alabama Beach Mouse

Development of HCPs for the Alabama beach mouse began in earnest in the early 1990s. The development of any HCP starts with addressing the known threats which lead to the listing of the species originally. Known threats to the Alabama beach mouse included the following:

- development of the entire lot,
- non-native landscaping,
- unrestricted exterior lighting,
- free-roaming cats,
- no efforts to restore habitat (or create sand dunes),
- foot traffic through the sand dunes,
- tropical storms, and
- disease.

Intensive development lead to habitat fragmentation and isolated populations which increased the chance of extinction in the event of a catastrophic tropical storm.

Today, applicants seeking to build in beach mouse habitat must incorporate conservation measures into their habitat conservation plan. The conservation measures address the known threats to the Alabama beach mouse. First, applicants must minimize their development plans to the maximum extent practicable. Part of this includes leaving habitat onsite which creates corridors, keeps habitat connected, and keeps populations connected. This decreases habitat fragmentation and the isolation of populations. However, if the proposed development plans are intensive (such as a building with a large footprint), then the applicants must mitigate by creating offsite habitat to replace what will be developed.

In habitat conservation planning, the Service has found Alabama beach mouse can exist in developed areas if the landscaping is native. Accordingly, applicants may not use

non-native vegetation, such as sod. While the majority of applicants have no landscaping plans, any plans for landscaping can only use native coastal vegetation found in Baldwin County. The Service maintains a list of native coastal plants for use in Alabama beach mouse habitat.

When managing for a nocturnal mouse and nesting sea turtles, it is important to have an artificial lighting regime which limits light pollution. Exterior lighting in HCPs are now required to be fully shielded. While the State of Alabama does not regulate exterior lighting along the coast, the City of Gulf Shores has sea turtle lighting regulations.<sup>7</sup> The goal of the Gulf Shores ordinance is to avoid illuminating the surrounding habitat by fully shielding fixtures to minimize light pollution.

HCPs require cats to be kept indoors at all times. Everyone knows cats and mice do not go together. Free-roaming cats are predators not native to this environment. Hunting by cats results in wildlife species being pursued, injured, and killed. Controlling free roaming cats not only protects the Alabama beach mouse, it protects birds and other wildlife, such as the monarch butterfly.

Unregulated foot traffic to get to the beach destabilized sand dunes and dune fields and created wide, flat, unvegetated paths. Foot traffic paths enable storm surges to reach further inland impacting more habitat and damaging private properties. Installing boardwalks help stabilize sand dunes, protect habitat, protect property, and make a more resilient coastline better able to withstand storm surges.

When a tropical storm hits the Alabama coastline, typically, the entire range of the Alabama beach mouse is impacted. Active restoration must occur after a tropical storm to help the coastal sand dune habitat recover quickly. Quicker habitat recovery means less of an impact to the Alabama beach mouse population. Sand dune restoration techniques have come a long way. There are more professional nurseries that grow coastal plants. Many nurseries can now send plants straight to an owner's property. These nurseries also collect seeds locally to ensure that the ordered plants match the location ensuring better survival.

The main tool of creating sand dunes has been the use of sand fencing which can create sand dunes while still allowing sea turtles to nest. Another tool has been the use of recycled Christmas trees. Christmas trees, installed in a "U" pattern toward the prevailing coastal winds, are a great sand catching device. Additionally, as they decay, they naturally

feed plants. The Alabama Department of Conservation and Natural Resources has used Christmas trees with great success at Gulf State Park. Most of the sand dunes observed there today were created by Christmas trees collected from Orange Beach and Gulf Shores.

Another threat to beach mouse habitat is gravel or oyster shell driveways when the material is scattered by hurricanes and other storms. After the tropical storm landfalls of Hurricanes Ivan and Katrina, these types of driveway materials were found over large areas of the sand dunes fields. These materials are almost impossible to remove. Additionally, the cost of gravel or shell removal is greater than the average homeowner can afford. New permits do not allow gravel to avoid a large additional loss of habitat over time. Only asphalt, concrete, a geo web material, or a Service-approved polymer-based driveway materials are allowed. These driveway materials are easier to remove and clean up after a tropical storm, if needed. If a HCP contains these conservation measures, the threat from development is greatly reduced and ensures the continued survival of Alabama beach mouse on private properties.<sup>8</sup>

### Success and Testing of Habitat Conservation Planning

Today, habitat conservation plans are located on various properties from inside the City of Orange Beach to near the tip of Fort Morgan. The HCPs require population monitoring. Monitoring provides valuable data on the Alabama beach mouse populations, especially about the effects of tropical storms, the status of the mouse, sand dunes conditions, and the success or problems of each plan. In some HCPs, the Service has 26 years of monitoring data. Monitoring also helps to evaluate proposed HCPs.

Hurricanes Ivan and Katrina were valuable tests of habitat conservation planning. It was estimated that 90-95% of the primary and second dunes habitat within the range of the Alabama beach mouse was destroyed in 2004 and 2005. Habitat slowly recovered and so did the Alabama beach mouse. By 2012, all of the pre-Ivan and Katrina Alabama beach mouse range was reoccupied. Early population modeling estimated the Alabama beach mouse would have been extinct by now. Because of the HCPs, the conserved habitat, and the efforts of our partners in conservation, the newer population models suggest the Alabama beach mouse does not have such a bleak future. Monitoring demonstrates they are persisting and doing quite well in developed areas.

### Other Conservation Success

Blessings in disguise have also assisted in the conservation and recovery of the Alabama beach mouse. The Alabama beach mouse recovery plan, which was approved in 1987, recommended that protection measures be developed to protect the mouse in case of an oil spill. In 2010, with the Deepwater Horizon oil spill, those measures were enacted to protect the Alabama beach mouse habitat while allowing safe clean up of the coast. Overall, the Alabama beach mouse was not affected. Population monitoring showed continued improvement over this time period.

The Alabama Department of Conservation and Natural Resources has conserved the Gulf Highlands tract on Fort Morgan and the Laguna Cove tract in Gulf Shores. The Gulf Highlands tract is the largest remaining undeveloped tract of land along Alabama's coast and contains high hurricane refuges. The Laguna Cove tract will provide Gulf Shores with a new public access park to Little Lagoon, while conserving the majority of its sand dunes for the Alabama beach mouse. Without penalties from the oil spill funding land purchases, these land conservation efforts most likely would never have occurred. Such land conservation efforts have improved the future of the Alabama beach mouse. 🐭

*William Lynn, M.S., is a Wildlife Biologist with the U.S. Fish and Wildlife Service, where he is the recovery and permitting lead for the Alabama beach mouse in the Alabama Ecological Services Field Office in Daphne, Alabama.*

### Endnotes

1. M.H. Smith, *The evolutionary significance of certain behavioral, physiological, and morphological adaptations of the Oldfield Mouse, Peromyscus polionotus*, Doctoral Dissertation, The University of Florida (1966).
2. U.S. Fish and Wildlife Service, *Biological Opinion for the Beach Club West and Gulf Highlands Development* (2011). *See also*, U.S. Fish and Wildlife Service, *The General Conservation Plan for Single Family/Duplex development in Alabama beach mouse habitat* (2012).
3. 16 U.S.C. § 1538.
4. 16 U.S.C. § 1532.
5. 16 U.S.C. § 1539(a)(1)(B).
6. U.S. Fish and Wildlife Service, *Habitat Conservation Planning Handbook* (2016).
7. § 6-12(G), *City of Gulf Shores Zoning Ordinance* (Aug. 2020).
8. U.S. Fish and Wildlife Service, *The General Conservation Plan for Single Family/Duplex development in Alabama beach mouse habitat* (2012).