U.S. Fish and Wildlife Service
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Post-Wildfire Clean-Up and Response in Houston Toad Habitat Best Management Practices

Purpose

The purpose of this document is to provide guidance and recommendations for minimizing potential impacts to the endangered Houston toad (*Bufo houstonensis*) during wildfire clean-up and response efforts. Please note this document may be updated or revised as new information becomes available. For further guidance and specific questions concerning these best management practices, please contact the U.S. Fish and Wildlife Service's Austin Ecological Services Office at (512) 490-0057.

Overview of Houston Toad Habitat Needs

The Houston toad is a federally-listed endangered species known to occur within a nine-county range in Texas that includes Bastrop County. This species depends on healthy and mature forest ecosystems with mixed species composition, significant canopy cover, an open understory layer with a diverse herbaceous component, and breeding areas (ephemeral wet-weather ponds and other water features, such as stock tanks, creeks, streams, wetlands, seeps, and springs) with shaded edges. Houston toads are most commonly found within the surrounding upland habitat adjacent to their breeding sites. They also use drainages and riparian areas for dispersal and movement. The edges of breeding ponds are used by emerging juvenile toadlets after they metamorphose from their larval (tadpole) stage. The protection and management of each of these habitat areas are critically important to the Houston toad's survival.

Assessments

Determining Fire Intensity

An important determination to make immediately after a wildfire is the intensity at which it burned in a given area. While wildfires can be very destructive, they are also dynamic (burning in different intensities in different areas).

- Low-Intensity Fires – Fires which burn at low intensity do not impact the forest canopy. The ground is still partially covered by old needles, leaves, and decaying wood. Leaves of small trees and shrubs may be browned or scorched. These fires do not significantly modify forest structure or composition, and post-fire changes can be beneficial to the habitat. No rehabilitation or restoration activities are necessary.

- Moderate-Intensity Fires – Fires that consume a large portion of needles, leaves, and decaying wood on the ground. However, enough leaf litter remains that bare ground is usually not exposed. Leaves of most small trees and shrubs are consumed by fire. Lower limbs of canopy trees are usually browned or scorched. Occasional canopy trees are completely scorched or burned. The largest and most vigorous canopy trees usually survive these fires. These fires can be beneficial to the habitat and improve forest health

by thinning trees and encouraging native grasses. Rehabilitation or restoration activities may or may not be necessary.

- High-Intensity Fires (also known as "stand-replacement fires") – Fires that consume more than half of the forest canopy, most of the small trees and shrubs, and everything (leaf litter, logs, woody debris, and herbaceous vegetation) on the forest floor. Bare soil is usually exposed in these areas, and few, if any, canopy trees survive. Rehabilitation and restoration activities may be required due to loss of canopy and organic material on the forest floor.

Assessing Tree Damage

Trees damaged by fire should be assessed to determine which trees are not likely to survive. After tree damage has been assessed, landowners can make decisions as to which trees may need to be removed.

- Light Damage – Foliage has been partially scorched or browned and/or the trunk has been blackened. If enough needles/leaves remain in an undamaged condition, the tree can continue to make food through photosynthesis. Trees within the Lost Pines ecosystem are adapted to this type of damage. Lightly damaged trees have a good chance of survival.

- Moderate Damage – A large portion of the foliage has been scorched or browned. Pine trees can survive this type of damage if the top branches are green and the growth buds have not sustained excessive heat damage. Oak trees can often survive scorching or browning of all foliage. While all trees can survive moderate fire damage, some may be weakened and more susceptible to future stresses and disease, particularly during drought conditions.

- Heavy Damage – All foliage has been scorched, browned, or consumed by fire. Pine trees will not survive if all needles are browned or consumed by fire. These trees are dead, even though the inner bark may remain alive for several weeks. Oak trees occasionally survive heavy fire damage. However, they may be unlikely to survive during drought conditions if all foliage has been consumed by fire.

Best Management Practices (BMPs)

Breeding Pond Disturbance

Soil disturbance and clearing should not occur within a 200-foot (61-meter) distance from potential Houston toad breeding sites and riparian areas. These may include ephemeral wet-weather ponds and other water features, such as stock tanks, creeks, streams, drainages, wetlands, seeps, and springs. Houston toad movement in and around these areas will increase during its upcoming breeding season(s).

- Operation of heavy equipment (for example, tractors, large trucks, bulldozers, skidders) should not occur within 200 feet (61 meters) from potential Houston toad breeding sites or riparian areas at any time of the year.

- Hand cutting (with loppers or chainsaws) may be conducted outside of a 164-foot (50-meter) distance from a potential Houston toad breeding site or riparian areas at any time of the year.

- Hand cutting may occur within the 164-foot (50-meter) radius of a potential Houston toad breeding site between July 1 and December 31 (outside of the Houston toad breeding season and emergence period). Limiting human disturbance within this area during this time can be particularly beneficial within low-intensity burn areas where there may be a greater chance of emergence success following Houston toad breeding. This period may be extended past December 31 if it is determined that Houston toads are not yet active in the area.

- Streams, riparian zones, wetlands, and areas near potential Houston toad breeding sites should not be used for staging equipment or refueling. Equipment must be stored, serviced, and fueled at least 200 feet (61 meters) away from these sensitive areas.

Salvage Logging

Salvage logging is the practice of logging trees in forested areas that have been damaged by wildfire or other natural disturbances.

- Salvage logging activities should not occur within 200 feet (61 meters) of a potential Houston toad breeding site (ponds, stock tanks, creeks, streams, wetlands, seeps, and springs that are within or immediately adjacent to a forested area) and riparian areas at any time of the year.

- Salvage logging should take place as soon as possible after the wildfire occurred and fire intensity assessments have been made. That is, logging should occur before seedlings or other vegetation begins to re-establish and before Houston toads enter their breeding season, which is when they are most active (see below).

- Salvage logging should be limited to the time between July 1 and December 31 (outside of the Houston toad breeding season and emergence period). This period may be extended past December 31 if it is determined that Houston toads are not yet active in the area.

- Salvage logging should not be conducted on steep or other highly erodible slopes. Trees in these areas can be felled and placed along the contours to prevent erosion.

- The number and size of entry and exit points for heavy equipment to move into and out of forested areas should be kept to the minimum needed for conducting safe and effective salvage logging operations, while also minimizing soil disturbance.

- Trees that retain even a small amount of green, live foliage should be left standing. If possible, professional arborists should be consulted if it is unclear if particular trees may or may not survive and should be removed.

- Some standing dead trees (at least 4 large standing dead trees per acre) should be left to provide valuable wildlife habitat and aid in the ecosystem's recovery.

- If feasible, logs, stumps, tree crowns, and other woody debris should be retained on the forest floor to provide cool, moist cover for Houston toads, particularly if this debris is located within a 165-foot (50-meter) distance of a potential Houston toad breeding site or riparian area.

- In some cases, it may be beneficial to spread slash and create small brush piles on the slopes of ponds or pools of water that could serve as Houston toad breeding sites. This may be particularly useful near ponds in high or moderate-intensity burn areas where there is very little ground cover remaining.

- Heavily and moderately damaged trees (as described above) near structures and roads are good candidates for removal since they could be hazardous to people and property. These trees should be removed as soon as possible after a fire to avoid impacts to seedlings and other regenerating vegetation within the Houston toad's habitat.

- Any mulch, chips, or other woody debris from tree salvaging operations should be left on site. Mulch should cover the forest floor in no more than a 1 to 2-inch layer, if possible. This can help disperse overland water flow and reduce runoff and erosion, while also allowing for regeneration of plants on the forest floor.

Log Landings

- The number and size of landings should be kept to the minimum needed for salvage logging operations to be conducted safely and efficiently, while also minimizing soil disturbance.

- Where feasible, log landings should be surrounded by temporary erosion and sediment control practices, such as silt fencing, when conditions may result in soil movement off the site.

- Silt fences should be inspected daily to ensure they are in good condition. Any holes, rips, tears, or gaps in the silt fencing materials should be repaired immediately.

- Landings should be located at least 300 feet (91 meters) from potential Houston toad breeding sites.

Debris Piles

The BMPs below refer to debris that include waste and other materials from homes and businesses (man-made debris) as well as woody debris collected for disposal.

- If possible, debris collection areas should be located at least 165 feet (50 meters) away from forested areas and 300 feet (91 meters) from known Houston toad breeding sites.

- Debris collection areas should be surrounded by silt fencing to prevent movement of small animals into or runoff of contaminants out of the site.

- Silt fences should be inspected daily to ensure they are in good condition. Any holes, rips, tears, or gaps in the silt fencing materials should be repaired immediately.

- Man-made debris should be collected separately from woody debris on a base material that prevents any contaminants or other hazardous materials from penetrating into the soil.

- Disposal of man-made debris, silt, excess dirt, or overburden should follow guidelines set forth by the Texas Commission on Environmental Quality.

Infrastructure Repair

Utility operations to be carried out by the Lower Colorado River Authority, Aqua Water Supply Corporation, Bluebonnet Electric Cooperative, Inc., Austin Energy, and their contractors should be conducted in accordance with the Bastrop Utilities Habitat Conservation Plan. Public infrastructure maintenance operations to be carried out by Bastrop County and their contractors should be conducted in accordance with the Lost Pines Habitat Conservation Plan. The BMPs below are provided for other entities conducting utility or infrastructure operations related to post-wildfire response efforts.

- Where possible, ground disturbing activities should be limited to existing rights-of-way (ROW) and roadways.

- If possible, clearing and ground-disturbing activities related to infrastructure repair and installations should be conducted between July 1 and December 31 (outside of the Houston toad breeding season and emergence period). This period may be extended past December 31 if it is determined that Houston toads are not yet active in the area. We recommend completing these activities as soon as possible after the wildfire occurrence.

- If possible, clearing and ground disturbing activities should not occur within 200 feet (61 meters) of a potential Houston toad breeding site (ponds, stock tanks, creeks, streams, wetlands, seeps, and springs that are within or immediately adjacent to a forested area).

- Clearing for all utility lines and other structures should be limited to the minimum amount needed for safety purposes.