

Habitat Management Techniques Flatwoods Salamander

USFWS Recommendations

Habitat Management Techniques to Benefit the Flatwoods Salamander.

These techniques are the most current recommendations that the Fish and Wildlife Service is providing to landowners. They may change in the future based on new information.

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STEP 1

Method to define the habitat needed to manage salamander populations.

1. Identify potential salamander breeding habitat (i.e., isolated, ephemeral wetlands with grassy edges within mesic pine flatwoods) and conduct surveys within these suitable sites (see Appendix E and sections of this recovery plan describing habitat and survey site selection). Conduct additional surveys to document new breeding sites.
2. Map primary (approximately 550 feet (ft)^{*} (168 meters (m)) from pond edge) zones and secondary (from primary zone edge to approximately 1,500 ft^{*} (457 m) from pond edge) zones around known and potential salamander breeding ponds. An ecotone, if present, would occur within these zones. Identify those breeding ponds occurring within 2 miles (3.2 kilometers) of each other to determine if metapopulations exist.
3. Designate flatwoods salamander management units containing a mix of known/potential breeding ponds and associated uplands. If possible, management units should be at least 200 acres (ac) (81 hectares (ha)).

STEP 2

Methods for managing or restoring suitable habitat conditions for the flatwoods salamander. The methods are prioritized with the most favorable listed first. The tools used to accomplish the desired habitat objectives are dependent upon site conditions, expertise of the land managers, and ownership objectives. It is likely that a mix of methods will be needed in most cases.

1. Use prescribed burning to restore the natural balance between hardwood/shrub and native ground cover (e.g., wiregrass and other native grasses) in management units containing flatwoods salamander populations. Where feasible, prescribe burn salamander habitat in habitat management units (i.e., burn blocks) of ≥ 200 ac (81 ha). In areas with insufficient fine fuels to carry fire, consider mechanical treatment and removal of shrubs or hardwoods by hand, using a brown tree cutter, gyrotrac or other similar means. In areas where hardwood encroachment is especially dense, consider “walking down” shrubs with a dozer when soil conditions are dry.

Following mechanical treatment, apply prescribed fire to burn seasoned fuel. Also, use prescribed fire as the preferred method for site preparation post-harvest.

- a. Administer growing season prescribed fire that burns from the uplands through the primary and secondary zones and into the wetlands. An effective burn in uplands is one in which 80% of hardwoods ≤ 3 inches (7.6 centimeters) DBH are top killed and nearly all herbaceous vegetation is consumed. Fluctuate the fire-return interval from 1 to 4 years. Use existing barriers and alternative control line methods (e.g., disked, wetlines, or foam lines) instead of plowing new firelines, particularly near wetlands.
 - b. Although growing season fire is preferred, high fuel loads may require the initial use of dormant season prescribed fire. It is critical that a growing season fire, conducted when the wetlands are generally dry (early growing season, before summer rains), be applied at least every third burn. This timing encourages fire to burn through the wetland ecotone and basin, thus removing/recycling litter, controlling hardwoods, and encouraging growth and reproduction of wetland/ecotone ground cover.
 - c. If primary and secondary zones or wetland basins fail to burn because of wet conditions or plow lines, wetlands used by flatwoods salamanders may be individually burned later, during dry conditions while the fuel load in surrounding uplands is still reduced.
 - d. If emergency fireline construction is necessary, repair the site by filling them (e.g., harrow them back in), followed by the planting of native groundcover species including bunchgrasses via broadcast seeding. Rework permanent firelines as needed.
2. Use mechanical treatment to restore or maintain open pine forests with reduced shrub cover and grassy ecotones around wetlands. Limit timber harvest in salamander habitat to periods when soil conditions are dry (generally late spring–early summer), and be liberal with logging contract extensions to ensure that soil conditions are appropriate. Logging should not be done under wet weather conditions. The best alternative is to postpone operations until drier conditions prevail. However, when operations must be conducted, follow any state BMPs for wet weather operations. Soil disturbance, rutting, and compaction during harvesting should be avoided, particularly during wet conditions, by using low-ground-pressure equipment, such as tracked equipment. Harvest pines using a mechanical cut-down machine with low-ground-pressure tires. Discourage new logging roads/trails and minimize skid trails and log decks. A biologist should monitor ongoing timber harvests to ensure that logging impacts are minimal.
 - a. UPLANDS
 - i. If new logging roads/trails are needed for timber harvest, they should be closed and restored following harvest.

- ii. Minimize skid trail impacts through the use of avoidance, prescription planning, pallets, and bridges.
 - iii. Distribute pine tops along skid trails to minimize soil compaction and ground cover disturbance.
 - iv. Thinning or uneven-aged management are preferable to clear-cutting during timber operations. If clear-cutting is necessary, intensive mechanical site preparation (i.e., root-raking, disking, stumping, bedding), and any other actions that cause significant soil disturbance, should not be conducted.
 - v. Restore degraded salamander habitat by planting longleaf pine seedlings and native ground cover species appropriate to the region (e.g. wiregrass or dropseed). Plant the minimum density of longleaf pine seedlings to achieve the desired future condition of a basal area of 50 to 80 sq ft/ac (11.5 to 18.4 sq m/ha) with a minimum of site entries for thinning. Hand-planting of both pine seedlings and herbaceous vegetation is preferred.
- b. WETLAND/PRIMARY AND SECONDARY ZONES
- i. Mark primary and secondary zones (e.g., with signs, or by painting trees) at the margins of salamander breeding habitat to prevent timber harvest equipment from entering ponds and damaging ground cover, compacting soil, and rutting.
 - ii. Do not harvest timber from a confirmed salamander breeding pond unless logging is conducted to improve the habitat quality of the wetland (e.g., opening canopy) and in cases where there is no risk of ground cover disturbance, soil compaction, and rutting.
 - iii. If timber harvest adjacent to a breeding pond is warranted as a restoration effort, thin merchantable pines so that a basal area of 35 to 50 sq ft/ac (8 to 11.5 sq m/ha) is maintained in 100% of the primary zone and 75% of the secondary zone around known breeding ponds. Leave on-site or girdle overstocked unmerchantable timber within the primary zone.
 - iv. Do not separate the primary and secondary zones from each other by cleared habitat.
 - v. Locate log landings outside of primary and secondary zones.
 - vi. Minimize skid trails and their effects through the use of prescription planning and techniques such as pallets and bridges. Locate skid trails, if they are necessary, parallel-not perpendicular- to wetland edges to reduce alterations to wetland hydrology.
 - vii. Do not put slash (timber debris) into breeding ponds.
 - viii. Unless done in conjunction with restoration (i.e., hardwood removal), limit silvicultural site preparation to prescribed fire within the primary and secondary zones. If longleaf pine restoration is conducted within the secondary zone, hand-planting of seedlings is preferred.
 - ix. Do not use fertilizer within the wetland/upland ecotone.
3. Use chemical treatment to control hardwoods and shrubs in situations where fire and mechanical treatment are ineffective or not feasible. Consultation with the Service is needed before biocides are applied in salamander habitat. Only use herbicides

labeled for application in and around wetlands that have a low toxicity for fish and other wildlife. If broadcast herbicides are used, they should not be applied during the egg/larval period (October to May).

- a. If possible, manually (rather than broadcast) apply foliar herbicides to noxious weeds following herbicide BMPs.
 - b. Treat undesirable trees using injection, frill, girdle, thin-line basal spray, or cut-stump herbicides.
4. Mechanically restore the hydrology and drainage patterns of wetlands; reduce runoff and siltation from roads. Plowed firelines should not be “tied” into wetlands nor should wetlands be encircled with deep, plowed firelines. Avoid fireline installation in primary and secondary zones.
- a. Plug ditches and restore firebreaks that are causing negative effects (draining the wetland, disrupting sheet flow to the wetland, connecting the wetland to other waterbodies, etc.) to the hydrology of an isolated wetland breeding site or mesic/wet flatwoods or allowing the invasion of fish that may act as predators of flatwoods salamander larvae.
 - b. Prevent siltation of wetlands from adjacent roads. This may require silt fencing or installation of wing ditches that move road drainage away from the breeding pond.
 - c. Place culverts under roads that are damming up natural drainage patterns.
 - d. Restore deep plowlines or beds that prevent fire from burning into wetlands.
5. Discourage habitat fragmentation within primary and secondary zones around wetlands, particularly fragmentation that interferes with dispersal patterns of salamanders.
- a. Close and restore all secondary roads, especially those not above grade.
 - b. Prohibit new road/trail construction within primary and secondary zones.
 - c. In areas with demonstrated need, reduce road mortality by providing drift fences or similar structures to guide migrating salamanders through appropriate below-road corridors/culverts.
 - d. When a system of firebreaks is needed, use existing firebreaks, including existing roads, trails, or streams.
 - e. Install permanent, disked firelines around fire management units containing salamander habitat; these firelines can be periodically reworked as needed.
 - f. In the event of wildfire, have a plan to contain a fire within a given burn unit or compartment without having to plow firelines through salamander breeding habitat or primary and secondary zones. Discourage “potato patching,” the use of multiple firelines to inhibit the spread of wildfire.

6. Discourage habitat fragmentation between known breeding ponds. Maintain dispersal corridors of appropriate habitat between sites.
7. Best Management Practices. Follow all state BMPs, where applicable.
8. Miscellaneous.
 - a. Close ATV trails that access flatwoods salamander habitat. Prohibit recreational vehicles in areas with seasonally wet soils, and in primary and secondary zones.
 - b. Do not plow food plots within primary or secondary zones.
 - c. Do not introduce fish into breeding habitat.
 - d. Prohibit stumping (harvest of resinous longleaf pine or slash pine stumps) from primary and secondary zones.
 - e. Do not manage for hardwood species or have fire exclusion areas within the primary or secondary zones.
 - f. Do not spray for mosquitoes or use any insecticides around known or potential salamander breeding ponds, or in primary and secondary zones. This includes applications along roads or roadside ditches adjacent to salamander breeding habitat. Aerial application should be avoided over known salamander habitat.

* The dimensions of primary and secondary zones have been rounded up from the figures used in the guidelines published in the final listing rule for the flatwoods salamander (59 FR 34272) for ease of application in the field.