

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
STRUCTURES FOR WILDLIFE

(No.)

CODE 649

DEFINITION

A structure installed to replace or modify a missing or deficient wildlife habitat component.

PURPOSE

To provide structures, in proper amounts, locations and seasons to:

- Enhance or sustain non-domesticated wildlife; or,
- Modify existing structures that pose a hazard to wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where planting or managing vegetation fails to meet the short-term needs of the species or guild under consideration. And in addition, where a State-approved wildlife habitat assessment identifies the need to:

- Provide loafing, escape, nesting, rearing, roosting, perching and/or basking habitat. Examples are nesting islands, nesting boxes, roosting boxes, rock piles, perching structures and brush piles.
- Modify existing structures to minimize the risks of injury or mortality to wildlife. Examples are the need to:
 - i. Retrofit an existing fence with fence markers,
 - ii. Modify an existing fence by removing wire or adding wildlife-friendly wire at appropriate spacing, or
 - iii. Modify an existing watering facility by installing escape ramps or removing obstacles that impede safe access to water.

Do not use this practice to:

- Install new structures or modify existing structures for the control of nuisance animal species.
- Install new structures or modify existing structures for the benefit of captive, feral, or domesticated animals.

This conservation practice is exempt from receiving coverage under the Tennessee Department of Environment and Conservation (TDEC) ARAP permits as long as NRCS provides technical or financial assistance for this conservation practice. This exemption allows this conservation practice to be installed adjacent to streams and/or wetlands, and for the outlet of any potential structures to be placed down through the stream channel bank and into the closest edge of the stream channel. The TDEC ARAP exemption does not change the permitting requirements for the U. S. Army Corps of Engineers (USACE) permits (404), the Tennessee Valley Authority (TVA) permits (26a – if located within the Tennessee River drainage area.), or any permits that may be required by local units of government.

The exception to the TDEC ARAP exemption described in the previous paragraph is where the conservation practice is planned to impound the stream or place fill material in a wetland, or directly impact a stream channel and/or a wetland. If this conservation practice is planned on a stream or in a wetland, then it is no longer exempt from the ARAP process. If planned on a stream or in a wetland, these conservation practices require USACE permits (404), TDEC permits (ARAP), TVA permits (26a – if located within the Tennessee River drainage area.), and any permits that may be required by local units of government. All conditions listed within the

permits shall be followed during the installation of the practice.

CRITERIA

General Criteria Applicable to all Purposes

Construct and install wildlife structures when the TN-NRCS Wildlife Habitat Appraisal Guide identifies limiting habitat component(s) of cover and/or shelter that cannot be provided within the desired time period with implementation of a vegetation management strategy. Other habitat appraisal guides may be approved by the NRCS State Biologist. Planners shall consult a NRCS biologist for guidance in determining necessary criteria.

Application of this practice in combination with other supporting and facilitating practices shall result in a conservation system that meets or exceeds the minimum quality criteria for wildlife habitat established in Section III of the Field Office Technical Guide (FOTG) for the appropriate fish and wildlife resource concerns.

Structures shall be designed and installed to meet the focus species’ biology and life history needs.

Use the following criteria to design, install or modify structures for wildlife:

- Restrict installation of structures and other disturbance (including monitoring) during critical periods such as nesting or brood rearing. Infrequent exceptions may occur when certain disturbance-causing activities are necessary to maintain the health of the community or control invasive or noxious species.
- Select the location of structures to meet the needs of the targeted species and not subject individuals to increased risks of injury or mortality.
- Select materials that are durable and safe for wildlife. Avoid caustic, dangerous, debilitating, and/or irritating materials. If the structure is exposed to sunlight, utilize ultraviolet resistant materials and/or coatings made with non-toxic substances for additional protection from deterioration due to sunlight exposure.
- Construct habitat structures to withstand normal environmental conditions and meet

the needs of the targeted wildlife for the target period of time.

- Construct the structure to allow access if it is identified as a wildlife structure requiring monitoring and management.
- Locate structures with access capability if monitoring or management of the structure is needed.
- Structures that positively or negatively affect federally protected threatened and endangered species and/or state species of concern must be approved by a NRCS biologist prior to practice implementation.

Additional Criteria for Native Pollinators

For creation, maintenance or enhancement of habitat for native bee species utilize the evaluation or appraisal methods and specifications recommended by The Xerces Society. Structures should be placed according to Table 1, “Structures Installed per Acre of Habitat.”

Additional Criteria for Structures

Table 1 provides general recommendations as to the number of structures that would be suitable to install in Tennessee. Greater or fewer structures may be required depending on site-specific conditions or as recommended by a NRCS biologist.

Table 1. Structures Installed per Acre of Habitat

Species	Recommended Number of Structures
Native bee species	2-3 structures per acre
Bat species	1 structure per 3 acres
Barn owl	1 structure per 100 acres of grasslands
Squirrel	1 per 2 acres of woodland
Wood duck	3 per acre of pool
Eastern bluebird	1 per 2 acres; 100 yds. apart
Purple martin	1 per acre
Prothonotary warbler	2 per acre

Additional Criteria for Nesting Structures

Appropriate animal species that may require installation of artificial nesting structures include:

- Native bees
- Bats (Indiana bats are not generally known to use bat boxes in Tennessee due to the suitable roost tree presence.)
- Barn owls
- Squirrels
- Various raptor species
- Wood ducks
- Bluebirds
- Other species as identified by a NRCS biologist.

Additional Criteria for Brush Piles

When natural cover is limited for wildlife, install brush piles where the establishment of woody shrubby thickets is not practical or as temporary structure until permanent shrubby vegetation becomes established.

Do not construct brush piles with a substantial base of logs, blocks, pallets or similar sturdy materials. Brush piles must be a minimum of 15 feet in diameter and at least 3 feet high. Living brush piles or fell hinge-cut trees together create a similar habitat type. Generally, smaller brush piles scattered throughout an area provide better habitat than one centrally-located large brush pile.

Minimize disturbances to these areas, such as mowing, disking, or clearing of vegetation. Where possible, allow vegetation to grow freely and avoid agricultural activities during the peak nesting season for small mammals (February to September).

Windrows sometimes are created from woodland clearing or logging operations. When working on sloping lands, pile trees to create windrows at the bottom of slopes to reduce soil loss. Leave 10-foot wide openings or gaps in windrows every 50 yards. These always should be protected from fire.

Additional Criteria for Rock Piles

Rock piles can be added in upland and semi-aquatic habitats and may be partially and/or seasonally inundated. Start constructed rock piles with the largest rocks (or boulders) on the bottom to create hiding places between rocks. Broken slabs of concrete can also be used for the foundation by arranging them loosely to form tunnels and cavities.

In semi-aquatic habitats, digging depressions under large flat rocks can create temporary pools for breeding frogs and salamanders.

- Use stones of different shapes and sizes, arranging the pile in a way that creates openings for shelter.
- Place pieces of chimney tile, old clay field tile or lengths of pipe at the base for entrances and tunnels.
- Flat rocks should be placed on top for amphibians and reptiles.

Additional Criteria for Modification of Existing Watering Facilities

Refer to (614) Watering Facilities for creation of new wildlife watering facilities.

Retrofit existing watering facilities (troughs, tanks, etc.) to allow for the escape of wildlife that become trapped and remove obstructions above the watering facility such as boards and wires.

Wildlife escape structures for watering facilities must meet the following requirements:

- Extend into the water, meet the inside wall, and reach to the bottom of the watering facility.
- Be firmly secured to the rim of the watering facility to prevent displacement by livestock.
- Have an exit slope no steeper than 45 degrees.
- Be located to cause minimal interference with livestock drinking.
- Install one structure for every 30 linear feet of watering facility edge.
- Be built of graspable, long-lasting materials, such as painted or coated metal grating, roughened fiberglass concrete, rock and mortar, or high-strength plastic composites sufficient to support the species.

Fencing material such as wire strands and boards shall not be within a 36 inch zone above the highest planned water surface (e.g. if a trough is bisected by fencing to provide water between two pastures, remove the lower strands of wires; or if wood bracing is present across the top of the trough, re-brace the tank to create an unobstructed space above the water's surface); or, rearrange the fence line to create an adjustable pivot point thereby removing any obstructions above the water surface while allowing full access to a single trough from two different grazing areas.

CONSIDERATIONS

Consider the following, prior to implementation of this standard and implement mitigation measures as appropriate.

- This practice may affect negatively target species and non-target species through increased predation, disease transmission, nest parasitism or other means.
 - Modification of existing onsite and offsite, barriers, or other conservation structures that may inhibit safe daily and seasonal movement of wildlife.
 - The establishment of native vegetation species, age, density and structure to supplement and/or eventually replace installed habitat structures.
 - Risks associated with the use of structures by non-target or nuisance species.
 - Safe passage strategies for non-target species including elk jumps, and road crossings.
 - Modifications to structures to inhibit access to the structure by predators.
 - Selection of appropriate color, orientation and exposure to support thermal regulation.
 - Consideration of using this practice to promote the conservation of declining species, including threatened and endangered species. Contact the State Biologist to coordinate these activities.
 - Consideration of unintended effects of pesticides and nutrient use on habitat quality.
- Consideration of using artificial nests by non-target species or nuisance species (e.g. house sparrows).
 - This practice and/or associated practices may include placement of fill material, the clearing of trees, and/or the construction of ditches or subsurface drainage pipes in low lying and floodplain type situations. The placement of fill material, the clearing of trees, and/or the installation of new ditches or drainage tiles in areas that are potentially wetlands is a violation of the Swampbuster portion of the Food Security Act, the Clean Water Act, and the Tennessee State Water Quality Control Act. All of these areas should be thoroughly evaluated for wetland potential prior to implementation of this practice and/or other associated practices.

PLANS AND SPECIFICATIONS

Develop plans and specifications for wildlife structures within the criteria of this standard. Within the plan, describe the biological and physical requirements for applying the practice.

Develop specifications for construction and installation of habitat structures by following State technical notes or the cited literature listed in the References section below. An example of technical literature is the Wildlife Habitat Management Leaflet Number 20 entitled Artificial Nesting Structures (USDA 2008).

Specify the number, location, spacing, grade, quantities, dimensions, materials and timing of installation of new or modification of existing structures. At a minimum the plans and/or specifications should include the following (if appropriate):

- Target species.
- Identified area or habitat designated on the conservation plan map.
- Quantity of structures.
- Approximate locations identified on the conservation plan map.
- Construction material specifications and/or drawings.

- Placement.
- Structure specifics including height, orientation, color, proximity to features and timing as applicable.
- Operation and maintenance plan/schedule.

OPERATION AND MAINTENANCE

Provide an operation and maintenance plan that is customary and reasonable for the wildlife structures being installed or modified. Provide the timing, scope and intensity of operation and maintenance, with consideration of the needs of the target and associated species.

As a minimum, the O&M will include a schedule (timing, frequency, duration) to:

- Monitor condition and/or usage of structures.
- Implement adaptive management by relocating, modifying or repairing structures as needed during the season with the least disturbance to target species.
- Conduct needed maintenance of structures such as removal of old nesting materials, nests of non-target species, undesirable debris, or abandoned structures.
- Install, modify and/or monitor during the season of year or time of day to minimize disturbance to wildlife.

- Remove all structures if they are determined (i.e. upon abandonment) as being potentially detrimental to the target species.

REFERENCES

Hatcher, R. M. Woodworking for Wildlife in Tennessee. Tennessee Wildlife Resources Agency. Online version: <http://tnwatchablewildlife.org/woodworkingforwildlife.cfm>

Tuttle, M.D., M. Kiser, and S. Kiser. 2013. The Bat House Builder's Handbook. Bat Conservation International. <http://www.batcon.org/resources/getting-involved/install-a-bat-house>

USDA, Natural Resources Conservation Service and Wildlife Habitat Council. 2008. Artificial Nesting Structures. Fish and Wildlife Habitat Management Leaflet No 20 (revised) Washington, D.C.

Kentucky Department of Fish and Wildlife Resources. Habitat How-To's – *Nesting Structures*. <http://fw.ky.gov/Wildlife/Pages/Habitat-Improvement-Program.aspx>