

NATIONWIDE AVOIDANCE & MINIMIZATION MEASURES FOR BIRDS

Within this document are effective measures that should be employed at all project development sites nationwide as applicable and practicable with the goal of avoiding and minimizing impacts to birds and their habitats. These measures are grouped into three categories: General, Habitat Protection, and Stressor Management. These measures include information only related to federal regulations and laws, and do not encompass state and local regulations and laws. These measures may be updated through time. We recommend checking the U.S. Fish & Wildlife Service’s (FWS) [Avoiding and Minimizing Incidental Take of Migratory Birds](#) website regularly for the most up-to-date list.

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1. General Measures

- a. Educate all employees, contractors, and/or site visitors of relevant rules and regulations that protect wildlife. See the FWS webpage on [Regulations and Policies](#) for more information on regulations that protect migratory birds.
- b. Prior to removal of an inactive nest, ensure that the nest is not protected under the Endangered Species Act (ESA) (see [list of endangered and threatened wildlife 50 CFR 17.11](#)) or the Bald and Golden Eagle Protection Act (the Eagle Act). Nests protected under ESA or the Eagle Act cannot be removed without a valid permit. More information is available on [Bird nests: what you need to know](#).
- c. Do not collect birds (live or dead) or their parts (e.g., feathers) or nests, or remove active nests without valid authorization or permit. Please visit the [FWS permits page](#) for more information on permits and general authorizations.
- d. Provide enclosed solid waste receptacles at all project areas. Non-hazardous solid waste (trash) should be collected and deposited in the on-site receptacles. Solid waste should be collected and disposed of by a local waste disposal contractor. For more information about solid waste and how to properly dispose of it, see the [EPA Non-Hazardous Waste](#) website.
- e. If you suspect birds were illegally killed or if five or more birds are found dead, notify the [local FWS Office of Law Enforcement](#), and follow the instructions provided.
- f. Consult and follow [beneficial practices for industry](#).

2. Habitat Protection

- a. Minimize project creep by clearly delineating and maintaining project boundaries (including staging areas).
- b. Minimize use of undisturbed land and maximize use of disturbed land for all project activities (i.e., siting, lay-down areas, and construction), except for where there may be species that are associated with disturbed land that require special conservation consideration (e.g., Mountain Plover).
- c. If considering development on undisturbed land, ensure that the area is not an area of high value to bird conservation (e.g., Important Bird Areas).
- d. Implement [wildlife-friendly soil erosion and dust control measures](#). For example:
 - i. Choose products with natural fiber netting, or no netting (such as spray on mulch)
 - ii. Choose products with 100% biodegradable materials
 - iii. Carefully install materials using natural stakes and bury edges
- e. Remove erosion control products when no longer needed. Design and build culverts, roadways, and other structures in tidal areas such that they do not restrict tidal flow. Restricted tidal flow leads to marsh degradation. For additional information, resources, and recommendations for facilitating tidal restriction avoidance and removal during development, please reference the Environmental Protection Agency's (EPA) and Federal Highway's (FHWA) [Tidal Restrictions Synthesis Review](#).

3. Stressor Management

Stressor: Vegetation Removal

Conservation Goal: Avoid direct take of adults, chicks, or eggs.

Measure 1: Schedule all vegetation removal and trimming, grading of vegetated areas, and prescribed fire outside of the peak bird breeding season to the maximum extent practicable. Use available resources, such as internet-based tools (e.g., the FWS's [Information, Planning and Consultation \(IPaC\)](#) and Avian Knowledge Network's [Rapid Avian Information Locator \(RAIL\)](#) tools) to identify peak breeding months for local bird species; or, contact your local FWS [Migratory Bird Program Office](#) or state wildlife agency for location-specific information.

Measure 2: When project activities cannot occur outside the bird nesting season, conduct surveys prior to scheduled activity to determine if active nests are present within the area of impact and buffer any nesting locations found during surveys.

- 1) Generally, the surveys should be conducted no more than five days prior to the scheduled activity.
- 2) Timing and dimensions of the area to be surveyed vary and will depend on the nature of the project, location, and expected level of vegetation disturbance.
- 3) If active nests or breeding behavior (e.g., courtship, nest building, territorial defense, etc.) are detected during these surveys, no vegetation removal activities should be conducted until nestlings have fledged, the nest fails, or breeding behaviors are no longer observed. If the activity must occur, establish a buffer zone around the nest and prohibit all activities within the buffer zone until nestlings have fledged and left the nest area. The dimension of the buffer zone will depend on the proposed activity, habitat type, and species present and should be coordinated with the local or regional FWS office.
- 4) When establishing a buffer zone, create a visible boundary (e.g., flagging tape, pin flags, and/or ropes/string) and signage to protect the area. If the boundary and/or signage is knocked down or destroyed, suspend work wholly, or in part, until the boundary is satisfactorily repaired.
- 5) When establishing a buffer zone, a qualified biologist should be present onsite to serve as a biological monitor during vegetation clearing and grading activities to ensure no take of migratory birds occurs. Prior to vegetation clearing, the monitor should ensure that the limits of construction have been properly staked and are readily identifiable. Any associated project activities that are inconsistent with the applicable avoidance and minimization measures, and activities that may result in the take of migratory birds will be immediately halted and reported to the appropriate FWS office within 24 hours.
- 6) If establishing a buffer zone is not feasible, contact the FWS for guidance to minimize impacts to migratory birds associated with the proposed project or removal of an active nest. To remove an active nest, the person removing the nest must have a [migratory bird permit](#) authorizing this action. The FWS recommends contacting a

[federally permitted migratory bird rehabilitator](#) prior to removing active nests for recommendations on disposition of nest contents.

- 7) When encountering a bird that is exhausted, ill, injured, or orphaned, you must immediately contact a federally permitted migratory bird rehabilitator and follow the rehabilitator's instructions. You may transport eggs or nestling to a federally permitted migratory bird rehabilitator, if the rehabilitator recommends that you do so.

Measure 3: Prepare a vegetation maintenance plan that outlines vegetation maintenance activities and schedules so that direct bird impacts do not occur.

Stressor: Invasive Species Introduction

Conservation Goal: Prevent the introduction of noxious or invasive plants.

Measure 1: Prepare a weed abatement plan that outlines the areas where weed abatement is required and the schedule and method of activities to ensure bird impacts are avoided.

Measure 2: For temporary and permanent habitat restoration/enhancement, use only native and local (when possible) seed and plant stock.

Measure 3: Create a vehicle wash and boot washing/scrubbing stations prior to entering sensitive habitat areas to prevent accidental introduction of non-native plants.

Measure 4: Remove invasive/noxious species that pose an attractive nuisance to migratory birds.

Stressor: Artificial Lighting

Conservation Goal: Reduce artificial nighttime lighting (e.g., light pollution).

Measure 1: To the maximum extent practicable, limit construction activities to the time between dawn and dusk to avoid the illumination of adjacent habitat areas, including the sky.

Measure 2: Follow any applicable recommendations on the FWS [nighttime lighting guidance webpage](#). Some recommendations from this collection are called out in measures 3-5 below.

Measure 3: If construction activity time restrictions are not possible, use down shielding or directional lighting to avoid light trespass into bird habitat and the sky (e.g., use a down-shielded 'Cobra' style light rather than an omnidirectional light system to direct light down to the roadbed), and keep lighting as close to the ground as possible.

Measure 4: To the maximum extent practicable, while allowing for public safety, use low intensity energy-saving lighting (e.g., LEDs) that provides the minimum lumens needed for the task. Avoid bright white light, such as is often used in LEDs, metal halide, halogen, fluorescent, mercury vapor and incandescent lamps. Select lighting with a Correlated Color

Temperature (CCT) that does not exceed 3000K in urban areas and does not exceed 2200K in parks, wildlife refuges, Important Bird Areas, and areas prone to fog.

Measure 5: Minimize lighting on associated construction or operation structures by using motion sensors or heat sensors.

Measure 6: Take measures to limit lighting as described in the measures above year-round, but especially during peak migration periods in spring and fall. You can reference resources like [Birdcast](#) to find peak migration dates or speak with the FWS's [Migratory Bird Program Office](#) in your region or a contracted biologist for additional guidance on specific bird migration timeframes in your area.

Stressor: Human Disturbance

Conservation Goal: Minimize prolonged human presence near nesting birds during construction and maintenance actions.

Measure 1: Restrict access to natural areas adjacent to the project site by erecting a barrier and/or avoidance buffers (e.g., gate, fence, wall) to minimize foot traffic and off-road vehicle uses.

Stressor: Collision

Conservation Goal: Minimize collision risk with project infrastructure and vehicles.

Measure 1: Minimize collision risk with project infrastructure (e.g., temporary and permanent) by increasing visibility and decreasing collision risk through appropriate marking and design features (e.g., [bird-friendly lighting](#) (if lighting is necessary), wire marking, etc.).

Measure 2: On bridge crossing areas, use fencing or metal bridge poles that extend to the height of the tallest vehicles that will use the structure.

Measure 3: Install wildlife friendly culverts so rodents and small mammals can travel under any new roadways instead of over them. This may help reduce raptor deaths associated with being struck while tracking prey or scavenging roadkill on the roadway.

Measure 4: Promptly remove roadkill to prevent scavenging and bird congregations along roadways.

Measure 5: Avoid planting “hazardous attractants” (e.g. fruited or preferred nesting vegetation) in medians or rights-of-way.

Measure 6: Eliminate use of steady burning lights on structures. Light with flashing lights or motion-sensor lights if lighting is necessary.

Measure 7: Reduce potential impacts to birds from fencing as follows: (1) Build a wildlife-friendly fence ([see recommendations](#)); (2) Attach ribbons or other distinctive markers at three

foot intervals along the fence to make it more visible to birds ([see recommendations](#)); (3) ensure the fence is no higher than absolutely necessary to prevent obstruction to low-flying birds that predate close to the ground; (4) make sure fencing is maintained to avoid broken wires that may snag or injure birds; and (5) if lighting is necessary, make sure the lighting is turned on only when absolutely necessary (lighting attracts and disorients birds, disrupting their natural flight patterns and may cause collisions and entanglement in fencing).

Measure 8: For existing infrastructure, make structures with glass more bird-friendly to reduce and avoid collisions by applying a pattern to the outside surface of windows and any other transparent surface (e.g., glass balcony railings), install bird friendly glass, or ensure all windows have exterior window screens. To make glass bird friendly, patterns must be applied to the exterior surface of the glass, with markers at least ¼" wide, spaced no more than two inches apart. In new construction, minimizing the total area covered in glass will save energy, reduce costs, and save birds. For more recommendations, visit the FWS's [Buildings & Glass Collisions webpage](#).

Measure 9: Avoid use of transparent noise walls along roads. If transparent noise walls are installed patterns must be applied to the exterior of the transparent surface, with markers at least ¼" wide, spaced no more than two inches apart (FWS standards). Products with patterns exist, but not all are bird-safe according to FWS standards. Use products that have been tested and vetted and proven effective in preventing collisions.

Stressor: Entrapment

Conservation Goal: Prevent birds from becoming trapped in project structures or perching and nesting in project areas that may endanger them.

Measure 1: Minimize entrapment and entanglement hazards through project design measures that may include:

1. Installing anti-perching devices on facilities/equipment where birds may commonly nest or perch.
2. Covering or enclosing all potential nesting surfaces on the structure with metal mesh netting, chicken wire fencing, or other suitable exclusion material prior to the nesting season to prevent birds from establishing new nests. The netting, fencing, or other material must have no opening or mesh size greater than 3/4" and must be maintained until the structure is removed. Flexible nylon or polypropylene netting sometimes marketed as "bird netting" can entrap and kill birds and is not recommended.
3. Cover/seal all vertical pipes/holes less 12" in diameter where birds may enter and become trapped.
4. Chimney caps must have ¾" or smaller steel mesh under the cap to prevent birds from entering.
5. If you live in the eastern half of the U.S. (Chimney Swift [*Chaetura pelagica*] range) and your chimney was built before 1960 and it is at least one foot in diameter or diagonal across or otherwise has evidence of Chimney Swift roosting or nesting, then follow the best practices for Chimney Swifts instead of the above measures. Best practices for Chimney Swifts are found here:

<https://www.fws.gov/story/chimney-swifts>.

6. Cover all open-top containers, pits and ponds containing toxic waste (e.g., oil pits and evaporation ponds) to prevent entrapment and illness. Oil or waste fluid spills or leaks should be cleaned up immediately.
7. Water containment areas that have steep edges and cannot be easily covered (e.g., stock tanks) should include wildlife escape ramps. There are numerous videos on the web about how to make effective wildlife escape ramps.

Measure 2: Use the appropriate deterrents to prevent birds from nesting and perching on structures where they cause conflicts, may endanger themselves, or create a human health and safety hazard.

1. During the time that the birds are trying to build or occupy their nests (generally, between April and August, depending on the geographic location), potential nesting surfaces where bird use of structures is likely to cause take (e.g., electric poles where fire/electrocution is possible), should be monitored at least once every three days for any nesting activity. Depending on the species (e.g., inactive Bald and Golden eagle nests are protected under the Eagle Act and inactive nests associated with threatened and endangered species [(see [list of endangered and threatened wildlife 50 CFR 17.11](#))] may have special protections under ESA) and on state and local regulations, it may be permissible to remove inactive nests (without birds, eggs, or otherwise dependent young), partially completed nests, or new nests as they are built (prior to occupation). If birds have started to build any nests, the nests shall be removed before they are completed, unless the nest is protected by federal, state, or local regulations.
2. If an active nest becomes established (i.e., there are viable eggs or young in the nest), all work that could result in abandonment or destruction of the nest shall be avoided until the young have fledged or the nest is unoccupied. Construction activities that may displace birds after they have laid their eggs and before the young have fledged should not be permitted. If the project continues into the following spring, this cycle shall be repeated. When work on the structure is complete, all netting shall be removed and properly disposed of.
3. Where there will be exposed flames (e.g., methane or natural gas flares) at mines, landfills, or other operations, install fencing tall enough to prevent direct flights through the superheated air, and top fencing with perch deterrents.

Stressor: Noise

Conservation Goal: Prevent the increase in noise above ambient levels during the bird breeding season.

Measure 1: Minimize an increase in noise above ambient levels during project construction by installing temporary structural barriers such as sandbags.

Measure 2: Avoid permanent additions to ambient noise levels from the proposed project by using baffle boxes or sound walls.

Stressor: Chemical Contamination

Conservation Goal: Prevent the introduction of chemical contaminants into the environment.

Measure 1: Avoid chemical contamination of the project area by implementing a Hazardous Materials Plan. For more information on hazardous waste and how to properly manage hazardous waste, see the [EPA Hazardous Waste](#) website.

Measure 2: Avoid soil contamination by using drip pans underneath equipment and containment zones at construction sites and when refueling vehicles or equipment.

Measure 3: Avoid contaminating natural aquatic and wetland systems with runoff by limiting all equipment maintenance, staging laydown, and dispensing of fuel, oil, etc., to designated upland areas.

Measure 4: Application of any pesticide product, including rodenticides and avicides, must comply with requirements on the product label. Implement the following wildlife-friendly application measures wherever possible.

1. Choose [non-chemical](#) alternatives
2. See EPA's website for [general measures to reducing impacts on wildlife from pesticides](#).

Stressor: Fire

Conservation Goal: Minimize potential fire impacts from project-related activities.

Measure 1: Reduce fire hazards from vehicles and human activities (e.g., use spark arrestors on power equipment, avoid driving vehicles off road).

Measure 2: Consider fire potential when developing vegetation management plans by planting temporary impact areas with low-growing, sparse, fire-resistant native species approved by the County Fire Department and local FWS Office.

Measure 3: Where there will be exposed flames (e.g., methane or natural gas flares) at mines, landfills or other operations, refer to beneficial practices to avoid and minimize bird injuries and mortalities from gas flares on the [FWS's website](#). For additional assistance with minimizing impacts from exposed flames, please contact your local FWS [Ecological FWS Field Office](#).

Measure 4: Schedule prescribed fire outside of the peak bird breeding season to the maximum extent practicable. Use available resources, such as internet-based tools (e.g., the FWS's [Information, Planning and Consultation \(IPaC\)](#) and Avian Knowledge Network's [Rapid Avian Information Locator \(RAIL\)](#) tools) to identify peak breeding months for local bird species; or, contact the FWS's [Migratory Bird Program Office](#) in your region for breeding bird information.