

BIRDS AND POWER LINES

Tri-State Generation and Transmission Association (Tri-State) uses several strategies to reduce the number of birds that are injured or killed when they contact power lines or electrical equipment. The strategies are:

- Preventive—conducting risk assessments and using avian-safe design standards where possible
- Reactive—documenting mortalities, notifying resource agencies and applying mitigation measures where appropriate
- Proactive—educating employees and being involved in organizations that conduct avian interaction research

Tri-State is developing a system-wide Avian Protection Plan (APP) to address and minimize bird interactions with the company's equipment and power lines. For additional information regarding birds and power lines, visit the Avian Power Line Interaction Committee Web site at www.aplic.org.

Roosting and Nest Management

Transmission line structures and equipment are attractive to birds for roosting and nesting. Utilities try to minimize the risk of injury to birds, damage to electrical equipment and outages to customers that may result when birds come in contact with power lines or their structures. Tri-State implements a variety of perch management approaches on structures to protect both the birds and electrical power reliability. Nest management programs include installing nest boxes or platforms in safe areas on or near structures, where warranted. Additionally, Tri-State has an established reporting protocol for the co-op's personnel. Tri-State's environmental department also has a protocol to coordinate, as appropriate, with the U.S. Fish and Wildlife Service to remove or relocate nests when appropriate.

Electrocution

Electrocution of birds typically is not associated with transmission lines greater than 115 kilovolts (kV). The electrical components generally are far enough apart that a bird can avoid contact with two of them at once, thereby avoiding fatally completing a circuit. Problems that do arise can be corrected in two primary ways:

- Isolation: Moving the components farther apart to get the necessary clearance or using perch discouragers to manage perching and roosting on a structure



Nest Management

- Insulation: Using covers or cover-up materials on various electrical components to prevent direct contact with the component that would cause the electrocution

Collision Minimization Measures

Pre-construction efforts

- Cluster lines together
- Site lines away from obvious flyways and important habitats, if possible
- Utilize structure configurations that minimize collision risk in sensitive areas where feasible

Post-construction efforts

- Monitoring collisions through the reporting system established as part of the APP
- Marking lines to make the lines more visible to birds in flight

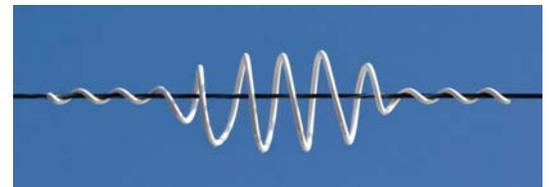
Marking lines

Marking lines with various types of markers can decrease but not eliminate bird collisions. The different types of markers vary in effectiveness. Devices include stationary bird and swan flight diverters and moving clamp-on markers (e.g., flappers). Examples of these devices are shown in the photos. Tri-State uses a variety of these markers on their lines. The decision to use them is based on:

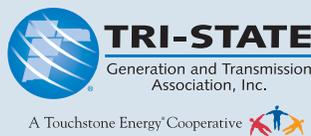
- Effectiveness
- Line voltage rating
- Line location
- Weight of markers
- Wind/ice loading factors
- Durability
- Ease of installation
- Effect on the view shed
- Susceptibility to vandalism



Clamp-on markers



Bird flight diverters



Contact Information

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