Birds and power lines

Xcel Energy 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 standards where possible
- Reactive – documenting mortalities, notifying resource agencies and applying remedial measures where appropriate
- Proactive – educating employees and being involved in organizations that conduct avian interaction research

For additional information regarding birds and power lines, visit the Avian Power Line Interaction Committee website at www.aplic.org.

Nest management

Roosting and nest management

Transmission line structures and equipment can be attractive to birds for roosting and building nests. Utilities try to minimize the risk of electrocution or injury to birds, of damage to electrical equipment, and outages to customers that may result when birds come in contact with power lines and structures. Perch discouragers are used to try to keep birds from perching or roosting on utility equipment. Nest management programs include installing nest boxes or platforms in safe areas on or near structures, where warranted. Additionally, utility personnel are educated on nest reporting, nest removal and platform construction.

Electrocution

Electrocution of birds typically is not associated with transmission lines greater than 138 kilovolts (kV) because generally the electrical components are separated enough that a bird can

avoid contact with two of them, which would fatally complete a circuit. Problems that do arise can be corrected in two primary ways:

- Isolation – moving the components farther apart to get the necessary clearance
- Insulation – using covers on various electrical components to prevent contact with the component that would cause the electrocution

Collision minimization measures

Pre-construction efforts

- Use vegetation, topography or man-made structures to shield lines
- Cluster lines together
- Site lines away from obvious flyways if possible

Post-construction efforts

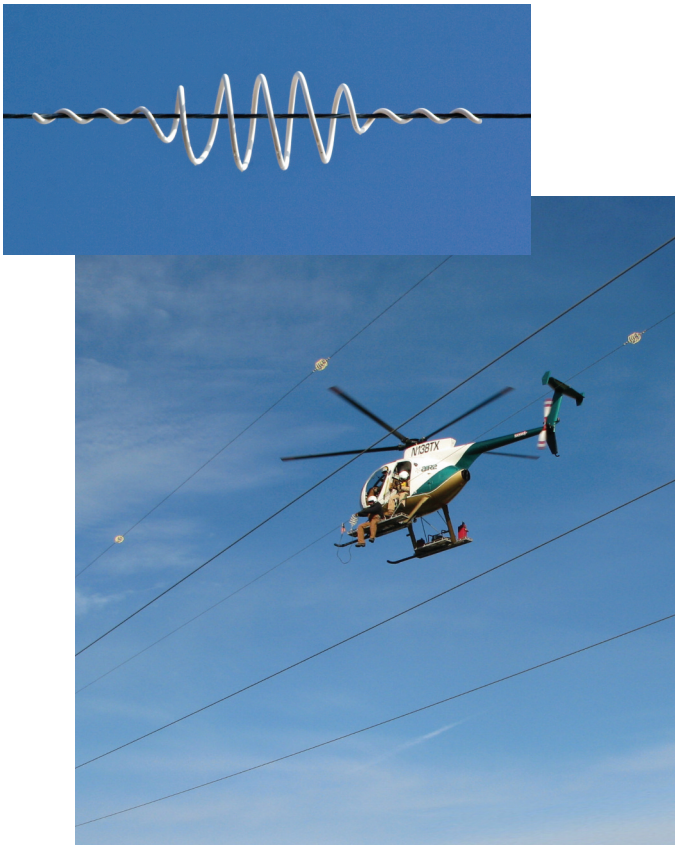
- Modify habitats
- Create habitats on the same side of the power line to minimize crossings
- Minimize human activities/disturbances near the line (educational process)

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 bird and swan flight diverters and clamp-on markers. Examples of these devices are shown in the photos. Xcel Energy has used a variety of these markers on its lines. The decision to use them is based on:

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

Clamp-on markers



Bird flight diverters