

## Determination of Cause of Death

The following guidelines are used to determine the most likely cause of death for each fatality encountered in the field. Cause of death is judged on the basis of 3 main variables: 1) species (*non-predated species* versus *all other species*, 2) proximity to turbines, power lines, and other structures, and 3) the condition of the carcass including type of injury and scavenging. The cause of death is circled on the fatality dataform. If a cause of death can not be determined, the unknown option is circled and the most likely cause/s are underlined. Justification for the determination of cause of death is provided on the dataform. Illness/old age, crippling bias, or scavenger removal is not accounted for in our determination of cause of death. See glossary at end of document for definitions of terms used.

### 1. Blade Strike/Turbine Collision

- A. Fatality is any *non-predated species* (i.e., golden eagle, red-tailed hawk or other large buteo, great-horned owl, etc.), found within the search area.
- B. Fatality is an *intact* (no evidence of scavenging) carcass with no apparent injuries and is found within the search radius.
- C. Fatality is any bird or bat species that has not been scavenged and has injuries consistent with a turbine blade strike or tower collision (i.e., blunt force trauma, severed wings, legs or torso, decapitation, etc.). This determination can only be made when the carcass has not been scavenged by vertebrates, as scavenging may obscure or mimic turbine-induced injury.

(Exceptions: electrocutions, line strikes, and BUOW fatalities at burrows; see sections 2, 3, and 4B below)

### 2. Electrocution

- A. Carcass exhibits obvious signs of electrocution (i.e., singed feathers, clenched talons, etc.).
- B. *Intact* carcass with no apparent injuries is found within 3m of a power pole, and is greater than 10m from turbine string axis (see Blade Strike, part B)

### 3. Line Strike

- A. *Intact* carcass with or without apparent injury is found outside of search radius beneath power lines or guy wires (within 3m of line), and no evidence of electrocution (see Electrocution).

### 4. Predation

- A. Fatalities of *non-predated species* (i.e., GOEA, RTHA, SWHA, FEHA, and GHOW) are never attributed to predation.

- B.** *Scavenged/predated* BUOW fatality within 1m of an *active burrow* is always considered predation, regardless of proximity to other sources of mortality.

## **5. Other**

This category is reserved for any other obvious or suspected cause of death. Evidence to support this assessment is provided on the dataform. These may include but are not limited to:

- Fence collisions
- Auto collisions
- Collisions with other structures such as transformer boxes or buildings
- Entanglement in netting (present on some non-operational turbines to prevent perching)
- Nestling fatalities found at base of turbine when young birds fall from the nest or when old nests are cleaned out of turbine housing.
- Significant turbine oil/grease on feathers

## **6. Unknown**

**A.** Blade strike/turbine collision underlined:

- Intact or scavenged carcass of any species with competing or uncertain causes of death. (For exception see Predation, part C)

**B.** Predation underlined:

- *Scavenged/predated* carcass of *non-predated species* found outside of search area with competing or uncertain causes of death.
- *Scavenged/predated* carcass of *any other species* found within or outside of search area with competing or uncertain causes of death.

**C.** Electrocutation underlined:

- Any bird species found within 3m of a power pole with competing or uncertain causes of death.

**D.** Line Strike underlined:

- Any bird species found within 3m of power lines or guy wires with competing or uncertain causes of death.

**E.** Other underlined:

- Carcass of any species exhibiting evidence of non-listed (other) source of mortality with competing or uncertain causes of death.

### Example fatality Scenarios

Fatality Scenario	Determination of Cause of Death	
	Circled	Underlined
Intact RTHA found 40m from turbine	Blade Strike	
Scavenged RTHA found 40m from turbine	Blade Strike	
Intact RTHA found 75 from turbine	Blade Strike	
Scavenged RTHA found 75m from turbine	Unknown	Blade Strike
Intact WEME 40m from turbine (Rare)	Unknown	Blade Strike
Scavenged/Predated WEME 5m from string axis	Unknown	Blade Strike, Predation
Intact WEME 5m from string axis	Blade Strike	
Intact RTHA with no injuries 1m from power pole, 75m from turbine	Electrocution	
Intact RTHA with no injuries 1m from power pole, 40 m from turbine	Electrocution	
Intact RTHA with no injuries 1m from power pole, 8m from string axis (Rare)	Unknown	Blade Strike, Electrocution
Scavenged/Predated CORA 1m from power pole, 40 m from turbine	Unknown	Blade Strike, Electrocution
Intact with no injury BUOW 5m from string axis (Rare)	Blade Strike	
Intact BUOW with no injury 40m from turbine (Rare)	Unknown	Blade Strike
Scavenged/Predated BUOW 5m from string axis	Unknown	Blade Strike, Predation
Scavenged/Predated BUOW at active burrow, 5m from string axis	Predation	
Scavenged/Predated BUOW at active burrow, 75m from turbine	Predation	
Scavenged BNOW 75m from turbine	Unknown	Blade Strike, Predation

**Glossary of terms:**

*Non-predated species:* eagles, large buteos, and great-horned owls.

*Any other species:* any bird or bat species other than non-predated species.

*Intact:* no evidence of scavenging or predation by vertebrates.

*Scavenged/predated:* carcass shows signs of being eaten by vertebrate scavengers or predators (i.e., feather spot, gnaw marks on bones or feathers, plucked feathers)

*Active BUOW burrow:* ground squirrel burrow with presence of whitewash and castings.