

**Resolution Copper Project and Land Exchange
Environmental Impact Statement**

USDA Forest Service
Tonto National Forest
Arizona

March 26, 2023

Process Memorandum to File

Research into Effectiveness of Biological Mitigation Measures

**Prepared by:
Jayden Peterson
Project Restoration Ecologist**

Purpose of Process Memorandum

The purpose of this process memorandum is to address several measures related to wildlife that are included as required mitigation in appendix J of the final environmental impact statement. Many of these measures were developed in collaboration with the Arizona Game and Fish Department or informed by the Section 7 consultation with the U.S. Fish and Wildlife Service. These measures were implemented because they are considered effective at reducing impacts to wildlife. The purpose of this process memorandum is to summarize additional research supporting the conclusion that these measures are effective. This process memorandum covers three basic topics of mitigation effectiveness:

- Avian species
- Desert tortoise
- General wildlife

Avian Species Mitigation Effectiveness

Reducing Avian Collision with Power Lines: The State of the Art in 2012

This document was authored by Edison Electric Institute and the Avian Power Line Interaction Committee. In Chapter 6, Line Marking to Reduce Collisions, several studies are cited on the effectiveness of bird deterrence. The measures include:

- Designing power lines to minimize bird collisions
- Line marking devices

These measures are written within the *Resolution Copper Wildlife Management Plan* (Resolution Copper 2020) and are in concurrence with this document. The mitigation concepts were developed by entities with specialized expertise in avian species, with the express intent of reducing avian collision with power lines. Based on this, the National Environmental Policy Act (NEPA) team finds these measures to be credible and effective for reducing impacts to birds.

Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006

The document was authored by Edison Electric Institute and the Avian Power Line Interaction Committee. Raptor electrocution mitigation measures and effectiveness are discussed in Chapter 5, Suggested Practices: Power Line Design and Avian Safety, and Chapter 6, Perching, Roosting, and Nesting of Birds on Power Line Structures. The measures include:

- Designing and constructing power poles to avoid raptor electrocution

This measure is written within the *Resolution Copper Wildlife Management Plan* (Resolution Copper 2020) and is in concurrence with this document. The mitigation concepts were developed by entities with specialized expertise in avian species, with the express intent of reducing raptor electrocutions from power lines. Based on this, the NEPA team finds these measures to be credible and effective for reducing impacts to wildlife.

Mitigation Plan for Deterring Birds from Lined Evaporation and Pumpback Ponds

This document was prepared by Integral Consulting, Inc., in 2008 for the Yerington Mine site in Nevada. It states the effectiveness of different bird deterrence techniques from potential toxic bodies of water. These include:

- Frequent inspections
- Use of car horns and handheld horns
- Pyrotechnics
- Wildlife calls
- Bird hazing
- Passive deterrence (floating balls, nets, etc.)

These measures are written within the *Resolution Copper Wildlife Management Plan* (Resolution Copper 2020) and are in concurrence with this document. The mitigation concepts cited were developed and tested by numerous experts with the express intent of reducing impacts to birds from potentially toxic water. Based on this, the NEPA team finds these measures to be credible and effective for reducing impacts to birds.

Desert Tortoise Mitigation Effectiveness

A Compilation of Frequently Implemented Best Management Practices to Protect Mojave Desert Tortoise during Implementation of Federal Actions

This document, written by the Desert Tortoise Council in 2017, outlines best management practices for protecting Mojave desert tortoise during implementation of Federal actions. These include:

- Regularly inspecting desert tortoise exclusion fencing
- Employing an authorized biological monitor on-site
- Providing worker training for desert tortoise identification and best practices

- Implementing best practices for encountering desert tortoise along trenches, borings, and other excavations
- Capping pipes with desert tortoise exclusion fencing.

These best practices will be implemented according to the *Resolution Copper Wildlife Management Plan* (Resolution Copper 2020) and are in concurrence with this document. The mitigation concepts were developed by an entity that is a leader with specialized expertise in Mojave desert tortoise, with the express intent of reducing potential impacts from project development. Based on this, the NEPA team finds these measures to be credible and effective for reducing impacts to desert tortoise.

Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat

This document, written by the Arizona Interagency Desert Tortoise Team in 2008, discusses best management practices when interacting with Sonoran desert tortoise during project work. These include:

- To the extent possible, schedule project activities when desert tortoises are inactive (November 1 to March 1)
- Provide desert tortoise protection education to all project personnel
- Designate a desert tortoise coordinator to oversee compliance with the mitigation program
- Move desert tortoises out of harm's way
- Minimize the project footprint and amount of habitat disturbance
- Prevent attraction of predators and enhancement of predator populations by containing trash and debris
- Desert tortoise crossings
- After project completion, remove hazards, restore habitat, and conduct required monitoring and reporting

These measures are written within the *Resolution Copper Wildlife Management Plan* (Resolution Copper 2020) and are in concurrence with this document. The mitigation concepts were developed by a team consisting of local agencies, State and Federal agencies, and private landowners with specialized expertise in Sonoran desert tortoise, with the express intent of reducing impacts from development projects. Based on this, the NEPA team finds these measures to be credible and effective for reducing impacts to desert tortoise.

General Wildlife Mitigation Effectiveness

Wildlife Compatible Fencing

This document, written by the Arizona Game and Fish Department in 2013, cites several studies and best management practices for Arizona wildlife and fencing. These measures include:

- Preventing mammals and reptiles from entering the sites
- Wildlife fence crossings

These measures are written within the *Resolution Copper Wildlife Management Plan* (Resolution Copper 2020) and are in concurrence with this document. The mitigation concepts were developed by a State agency with specialized experience in fencing impacts to wildlife within Arizona. Based on this, the NEPA team finds these measures to be credible and effective for reducing impacts to wildlife.

Literature Consulted

Arizona Game and Fish Department. 2013. *Wildlife Compatible Fencing*. Phoenix: Arizona Game and Fish Department. March 29.

Arizona Interagency Desert Tortoise Team. 2008. *Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat*. June.

Avian Power Line Interaction Committee. 2006. *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006*. Washington, D.C. and Sacramento, California: Edison Electric Institute, Avian Power Line Interaction Committee, and the California Energy Commission.

Avian Power Line Interaction Committee. 2012. *Reducing Avian Collisions with Power Lines: The State of the Art in 2012*. Washington, D.C.: Edison Electric Institute and Avian Power Line Interaction Committee. October.

Desert Tortoise Council. 2017. *A Compilation of Frequently Implemented Best Management Practices to Protect Mojave Desert Tortoise during Implementation of Federal Actions*. Palmdale, California: Desert Tortoise Council. September.

Integral Consulting, Inc. 2008. *Mitigation Plan for Deterring Birds from Lined Evaporation and Pumpback Ponds: Yerington Mine Site*. Prepared for Atlantic Richfield Company. Mercer Island, Washington: Integral Consulting, Inc. August 15.

Resolution Copper. 2020. *Wildlife Management Plan*. Superior, Arizona: Resolution Copper. October.