

# EAGLE PROTECTION OFFSET PROGRAM (EPOP)

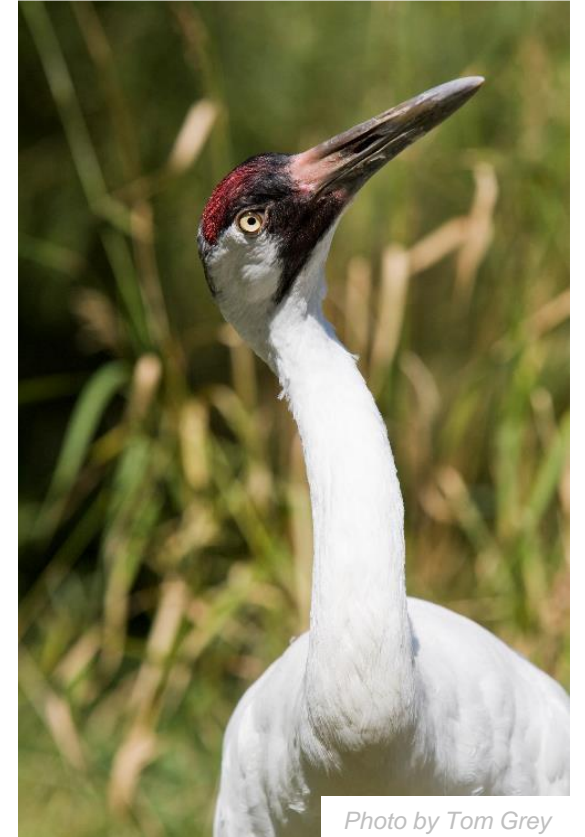
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*Burns & McDonnell*

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*Northwestern Energy*



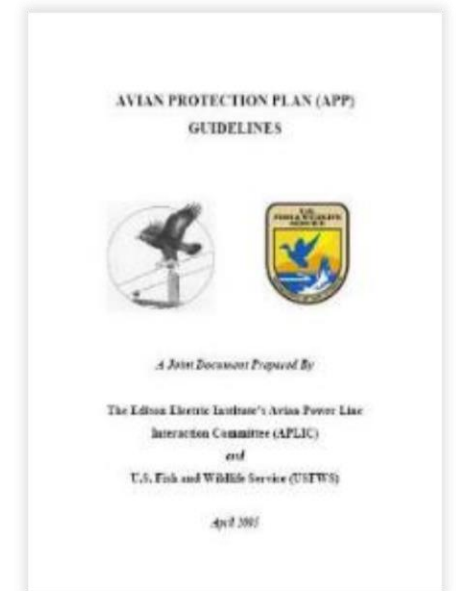
# Regulations – Avian Resources

- Migratory Bird Treaty Act (MBTA)
  - Over 1,020 species covered
- Bald and Golden Eagle Protection Act (BGEPA)
- Endangered Species Act (ESA)
- State and Federal Special Status Species
- USFWS Law Enforcement Actions
  - Fines ranging from \$100,000 to \$10,000,000
  - Implementation of retrofits and Avian Protection Plans (APPs)
  - Multi-year probation period



# APLIC and USFWS Guidance

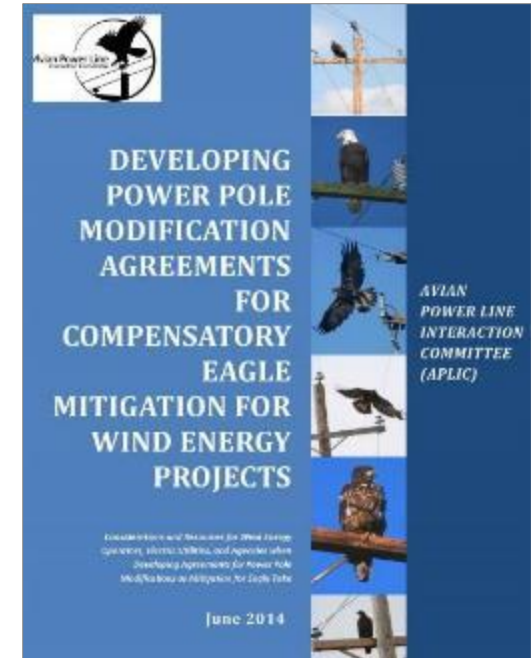
- 2005 | Avian Power Line Interaction Committee (APLIC) and USFWS released Avian Protection Plan Guidelines
  - Programmatic approach focused on:
    - System wide electric utility infrastructure
    - New construction
    - Operation/maintenance activities
    - Mortality reporting and employee training
- 2013 | USFWS issued Land-Based Wind Energy Guidelines and Eagle Conservation Plan Guidance
  - Requires development of Bird and Bat Conservation Strategy (BBCS) and Eagle Conservation Plan (ECP) for individual wind projects
  - Resource Equivalency Analysis (REA)



# APLIC and USFWS Guidance



- 2014 | APLIC released Developing Power Pole Modification Agreements for Compensatory Eagle Mitigation for Wind Energy Projects
  - Practical considerations
  - Planning flowchart for Wind Energy Owner (WEO), Utility, and USFWS
  - Multi-phase Permittee Initiated Mitigation (PIM) approach for power pole retrofits
  - Utility should have an APP and be able to show additive benefits of efforts
- 2016 | USFWS Final Eagle Rule
  - Incidental Take Permit (ITP) regulations (50 CFR 22.26 (d))
  - “High risk” power pole retrofits for offsetting take



# Additional American Wind Wildlife Institute (AWWI) and USFWS Eagle Rule Mitigation Efforts



**AMERICAN WIND WILDLIFE INSTITUTE**

## Eagle Rule and Mitigation

- May provide increased flexibility – minimization versus offset
- Broader geographic flexibility
- Service willing to consider innovative mitigation techniques (i.e. AWWI mitigation modeling work)
- AWWI – USFWS Work of Western Golden Eagle Team (WGET) Interaction
  - Optimizing mitigation effectiveness
  - Quantifying effectiveness

**Bald Eagle Management Units**

**Golden Eagle Management Units**

Maps by AWWI

25

Other mitigation considerations being studied by AWWI are lead shot abatement, road kill removal, managing prey, deterrents and nest enhancement.

# How Electrocution Occurs

- Phase-to-phase contact
- Phase-to-ground contact
- Horizontal phase separation less than 60”
- Vertical separation less than 40”
- APLIC recommended minimization measures
  - Isolate: separation of phases
  - Insulate: covering materials



# Various Types of Power Pole Retrofit Programs



- Permittee Initiated Mitigation (PIM)
  - Agreement between WEO or ETP holder and electric utility
  - Focused on long-term fixes, 30-year credit
  - Requires significant commitment
- In-Lieu Fee Program (ILF) | Eagle Electrocutation Solutions, LLC
  - Focused only on equipment pole fixes using covering materials
  - Short-term fix, 10-year credit
  - Responsible for pole risk assessments, reporting, and program management
- Eagle Protection and Offset Program (EPOP)
  - Long-term fix, re-frame or rebuild, 30-year credits
  - Circuit-wide approach with priority criteria
  - Partnership with Utility to retrofit poles within one year

# Eagle Protection and Offset Program (EPOP)



- Program Sponsor: Burns & McDonnell
- Infrastructure Sponsor (IS): electric utility partner
  - Committed to perform work within 12 months
- ETP Permittee: purchaser of credits
- Risk Assessment
  - Identify and prioritize “high risk” circuits and pole retrofits
- Retrofit Action Plan
  - Developed with IS and USFWS
    - Identification of Program Credit Area (PCA)
    - Identify high risk circuits and number of poles/credits in Retrofit Pool
- Credit Tracking, Payments and Reporting
  - Retrofit verification
  - Issue credits/payments
  - Annual reporting



*Photo by Jerry Liguori*

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INTERACTION SYMPOSIUM



# EPOP Risk Assessment Method



- Circuit-wide (all poles on a circuit) approach
- Identifies High-Risk circuits with an average Relative Risk Index (RRI) of 0.40 or greater
- Located within high-quality eagle habitat
- Additional environmental indicators will be used to prioritize circuits
  - APLIC conformance
  - Mortality data from IS
  - Prey or food sources
- Retrofits will:
  - Be reframed or rebuilt
  - Provide 30-year credit
  - Completed in one year

Structure Design	RRI <sup>2</sup>
Single phase with high neutral	0.44
Flat top three phase with neutral on crossarm or pole and close to phases <sup>1</sup>	0.51
Flat top three phase on 6-8-foot crossarm <sup>1</sup>	0.38
Double circuit post mount 35 to 69-kV insulators with high neutral <sup>1</sup>	0.62
Post mount three phase 35 to 69-kV insulators with ground wire bonding and high neutral or running along side of pole <sup>1</sup>	0.51

<sup>1</sup>Less than 60" separation phase to phase or phase to second point of contact

<sup>2</sup>Dwyer et al. (2014) Predictive Model of Avian Electrocution Risk on Overhead Power Lines.

# Non-Equipment High Risk Poles



69-kV, 3-phase on crossarm with neutral along side of pole



3-phase on flat top design with no neutral



Short post-mounted insulators with ground wire bonding

# Non-Equipment High Risk Poles



3-phase on flat top design  
with neutral on crossarm



Single phase with ground wire  
at top of pole



Short standoff insulators on  
jumper wires of angle steel pole

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# 30-Year Fixes for High Risk Poles



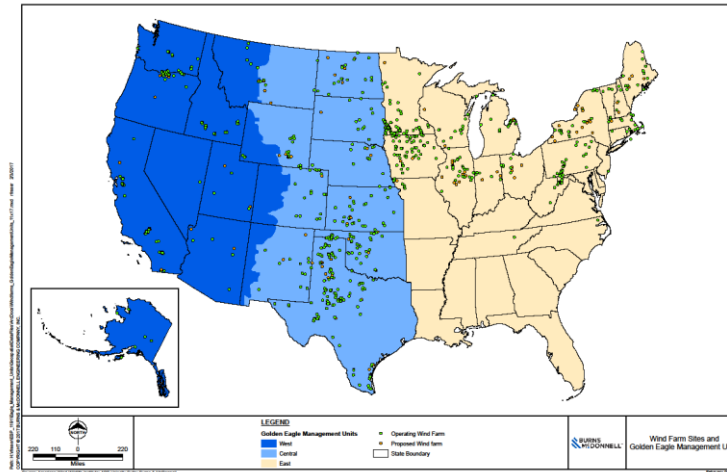
- Implement 60-inch horizontal and 40-inch vertical separation between phases
  - Lower crossarm or replace with longer 10-foot crossarm- wood or fiberglass
  - Rebuild and replace with taller pole and lowered crossarm design
  - Remove covers and rebuild with post-mount insulators using at least 115-kV or use suspension design



# Northwestern Energy Electrical Operations



- Electrical operations and customers in portions of MT, SD and WY
- Overlaps Central and Pacific USFWS GOEA Management Units
- Expressed interest in partnering as the first Infrastructure Sponsor



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# Remote Western Utility Circuits



Many western electric lines in golden eagle habitat have a lower density of equipment poles when compared to the Dwyer study area.

# Roundup Case Study



**1,000 square  
mile area in  
South Central  
Montana with  
4,100 poles  
serving widely  
scattered small  
oilfields**



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# Rabbit Populations Peaked Late 1990s to 2003



Attracting  
eagles to  
available  
perches

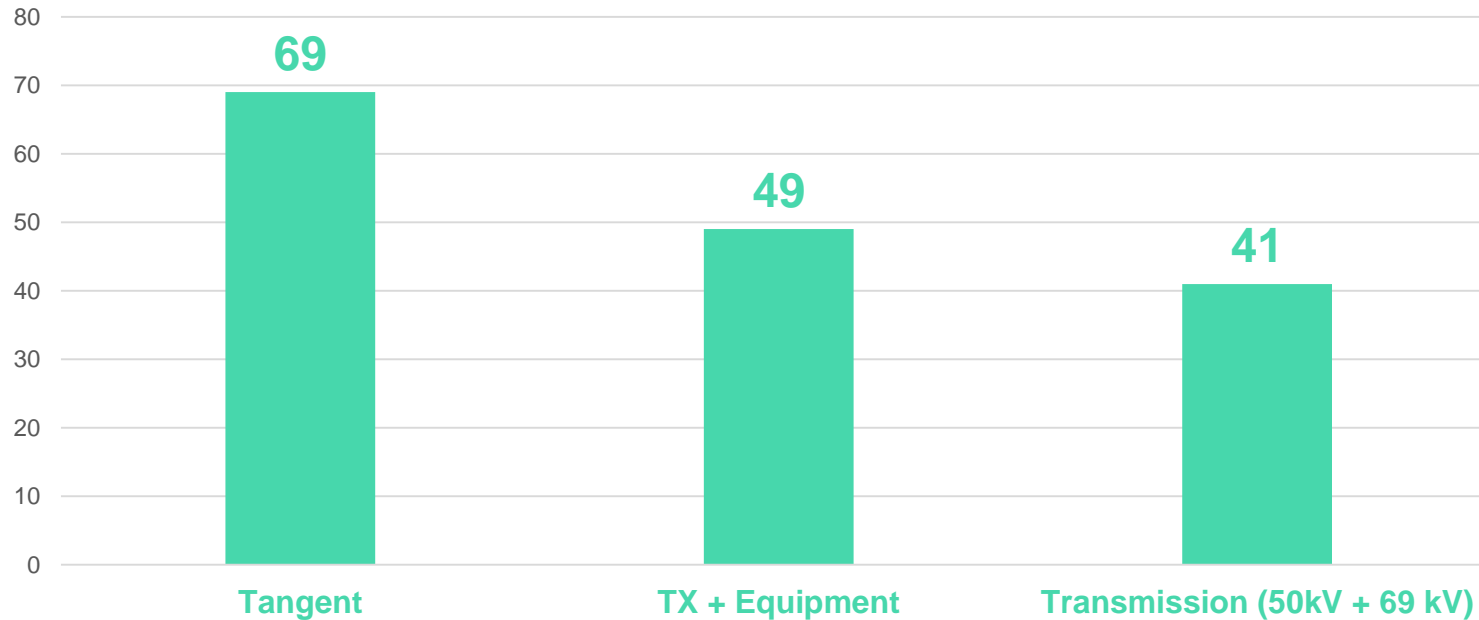


# Roundup Area Case Study

*Three categories of offending poles*



## Eagle Mortalities in the Roundup Area 1996-2003



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# Tangent Poles



Most common pole type has no jumper wires or equipment. Our older lines don't meet APLIC guidelines.

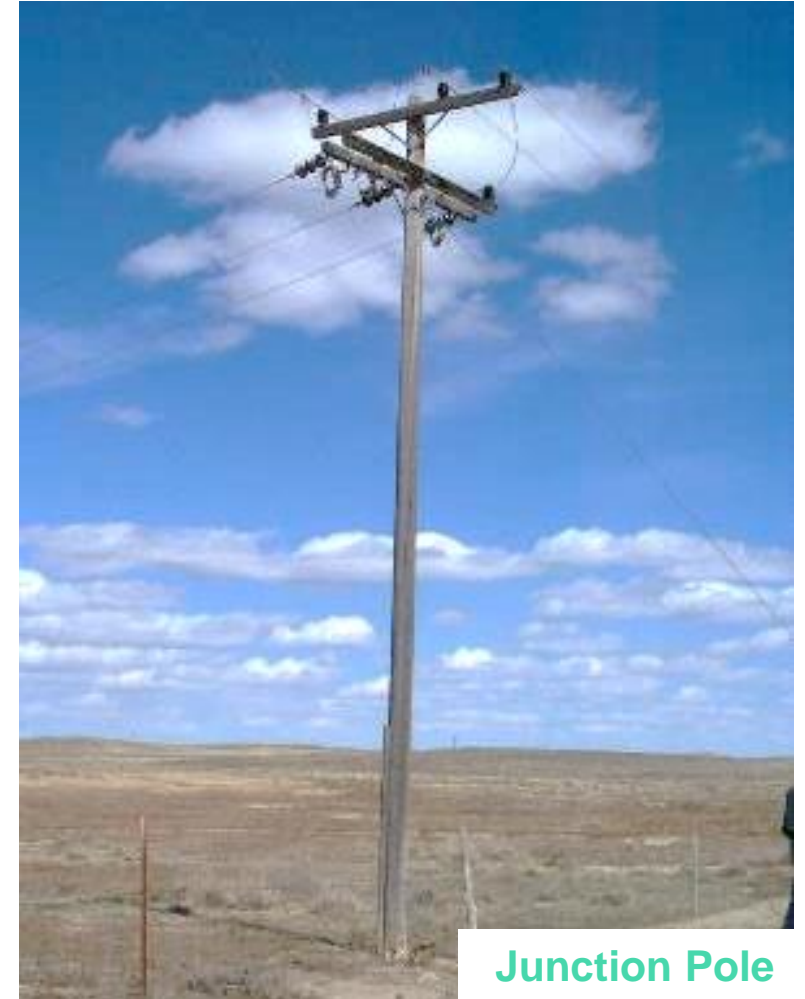


# Equipment Poles

Equipment poles include jumper wires and may also include, transformers, cutouts, lightning arrestors, or other equipment presenting increased risk to raptors.



Transformer Bank



Junction Pole

# Transmission Poles ( $\leq 69$ -kV)



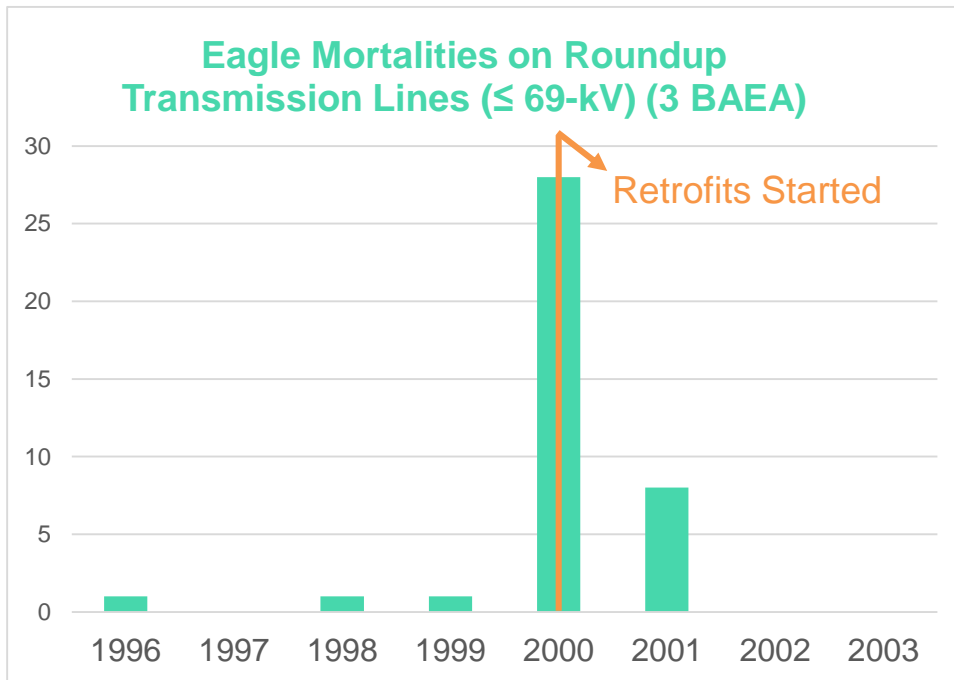
Higher  
voltage and  
less than 60  
inches of  
horizontal  
clearance



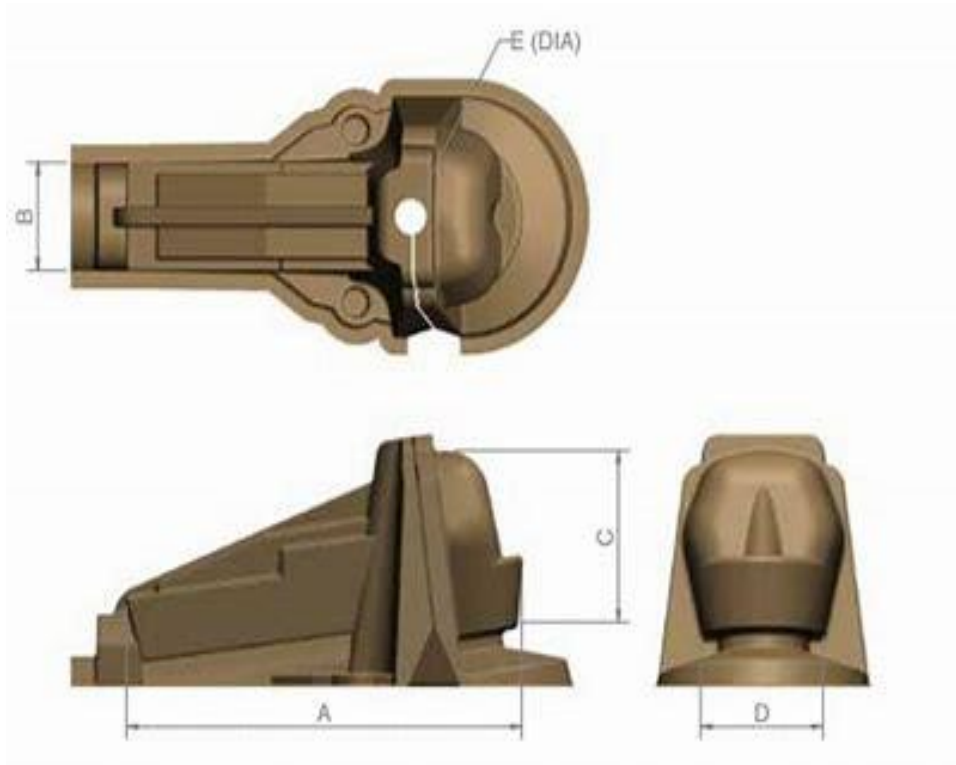


# Tangent and $\leq$ 69-kV Retrofits

Initial Montana Fish Wildlife and Parks aerial survey identified the 69-kV line as the deadliest and initial retrofitting focused on this line

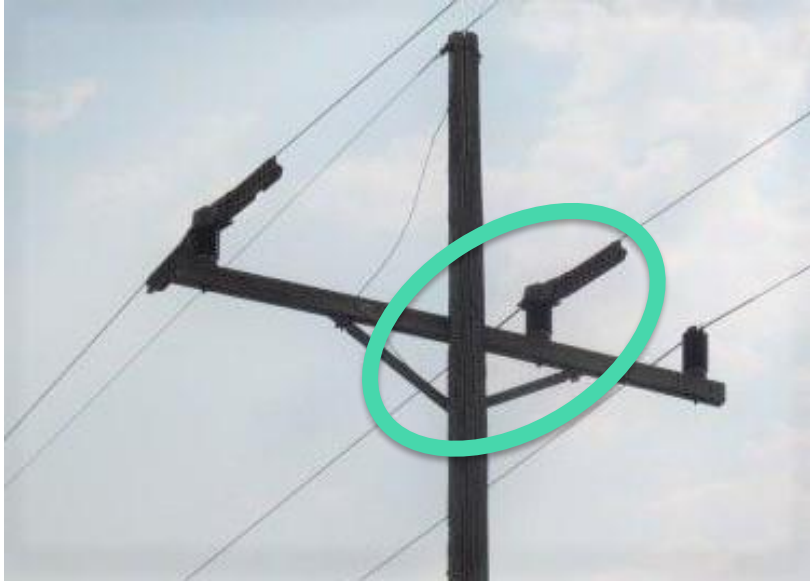


# Equipment Retrofits



Utilized any available products including many not evaluated and approved by Standards Committee.

# Products Used 20 Years Ago Are Failing



Anything was better  
than no covers



# Reasons for Participating in EPOP



NorthWestern is committed to sound environmental stewardship while delivering reliable service.

- Raptor electrocutions also may cause power outages, equipment damage and start fires.
- Installing covering materials is a short-term fix. Reframing is permanent and preferred.
- Complete circuit solutions in rural areas will protect a higher percentage of eagles.
- EPOP will provide opportunity to increase our proactive raptor protection efforts

