

Tolerances of Raptors to Blasting and Construction Activity during Hydroelectric Expansion on the Susquehanna River A Year of Success

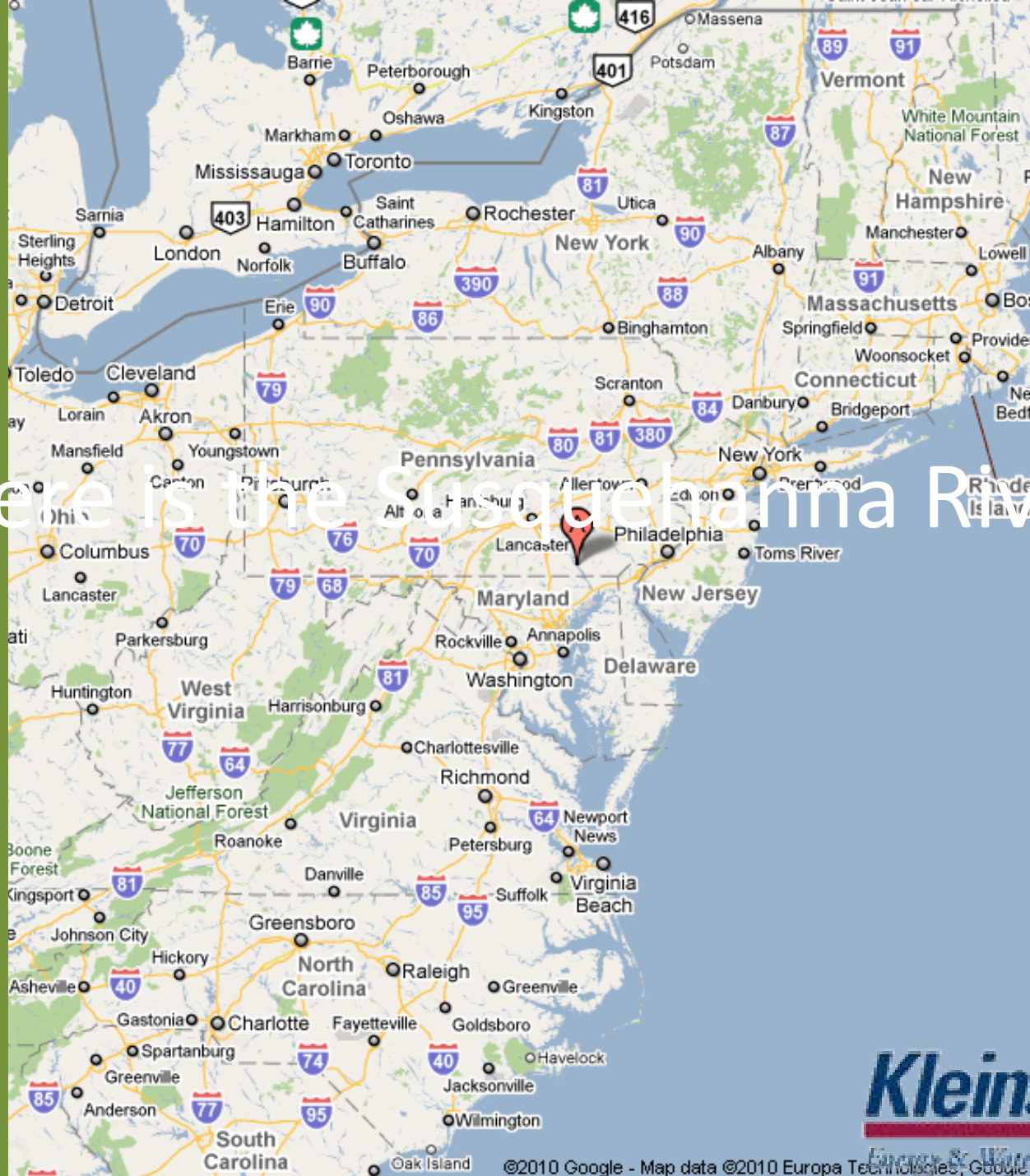


Nicholas Morgan

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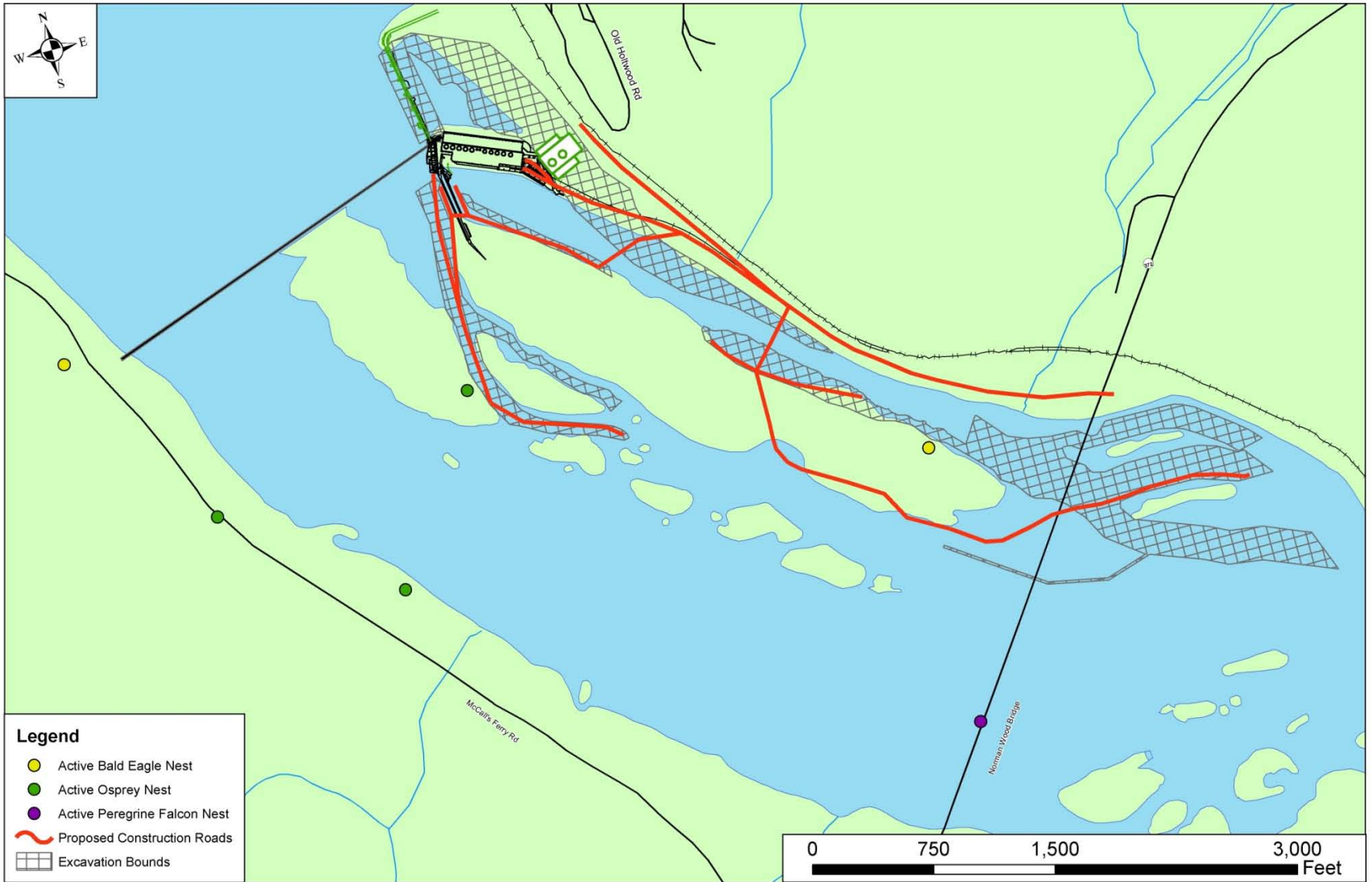
Where is the Susquehanna River?



Holtwood Expansion

- 3 Years of Construction
- Excavate over 1.6 million cubic yards
- Double the Powerhouse Capacity
- Improve Fish Passage





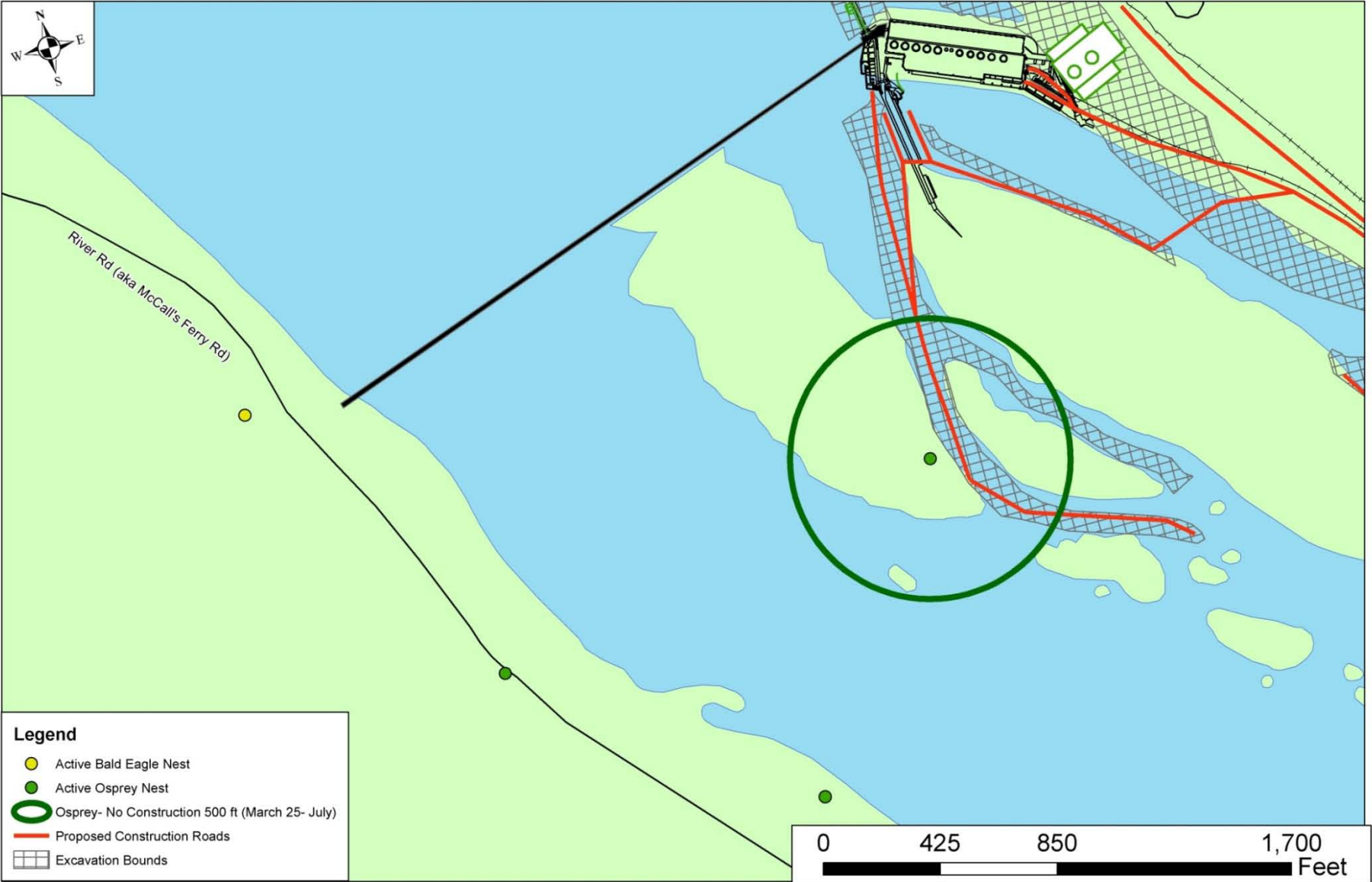
Raptor Management

- Osprey (*Pandion haliaetus*)
 - Pennsylvania Threatened
- Peregrine Falcon (*Falco peregrinus*)
 - Pennsylvania Endangered
- Bald Eagle (*Haliaeetus leucocephalus*)
 - Pennsylvania Threatened
 - Federally Protected

Osprey

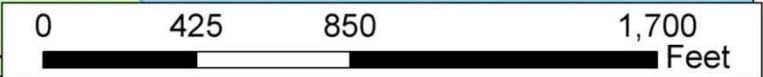
- Three Nests
- Recommended 500 ft buffer during the nesting season





Legend

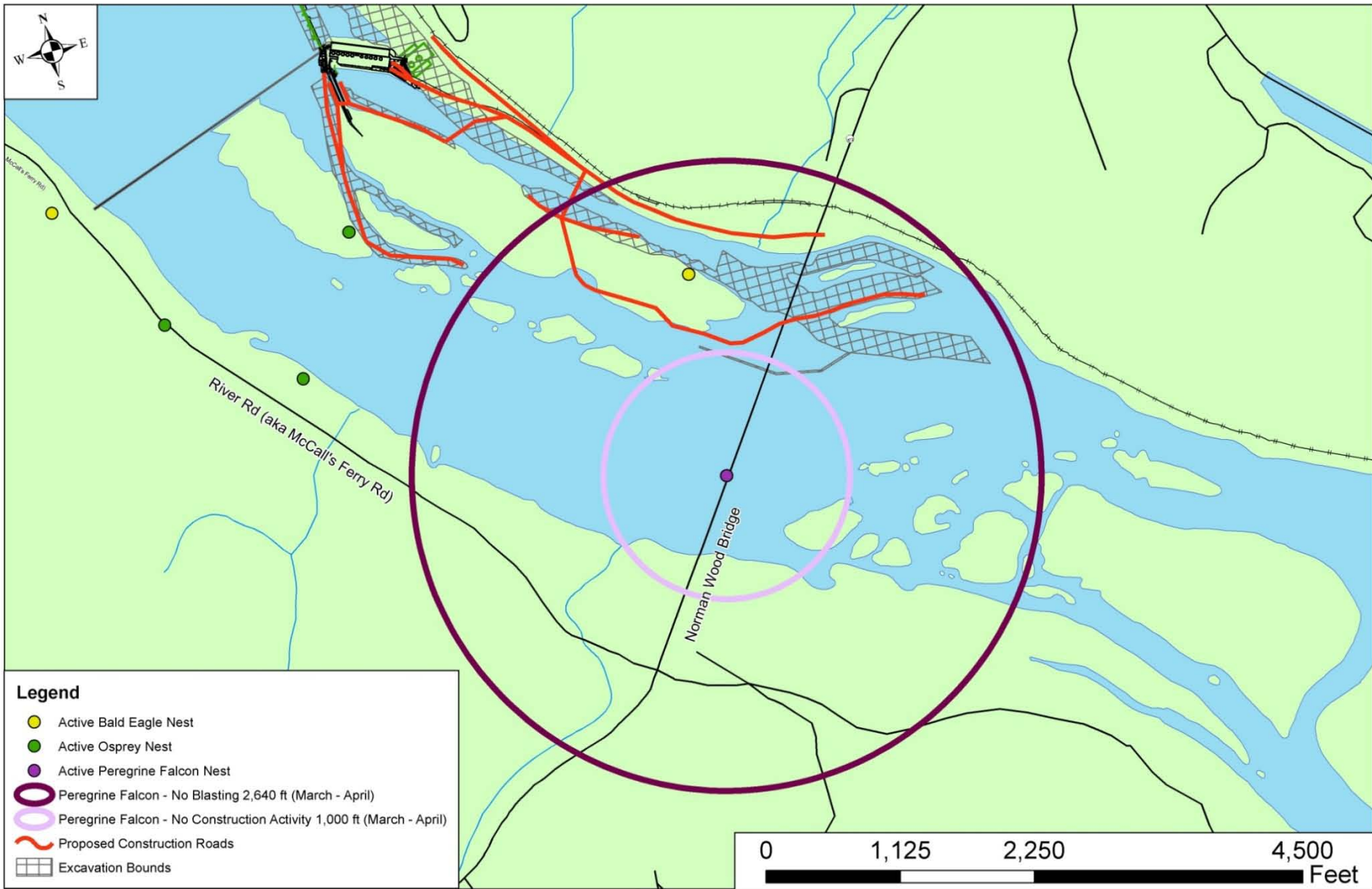
- Active Bald Eagle Nest
- Active Osprey Nest
- Osprey- No Construction 500 ft (March 25- July)
- Proposed Construction Roads
- ▧ Excavation Bounds



Peregrine

- One Stop Over Pair
- 0.5 Mile- No Blasting
- 1000 Feet- No Construction Activity





Bald Eagle

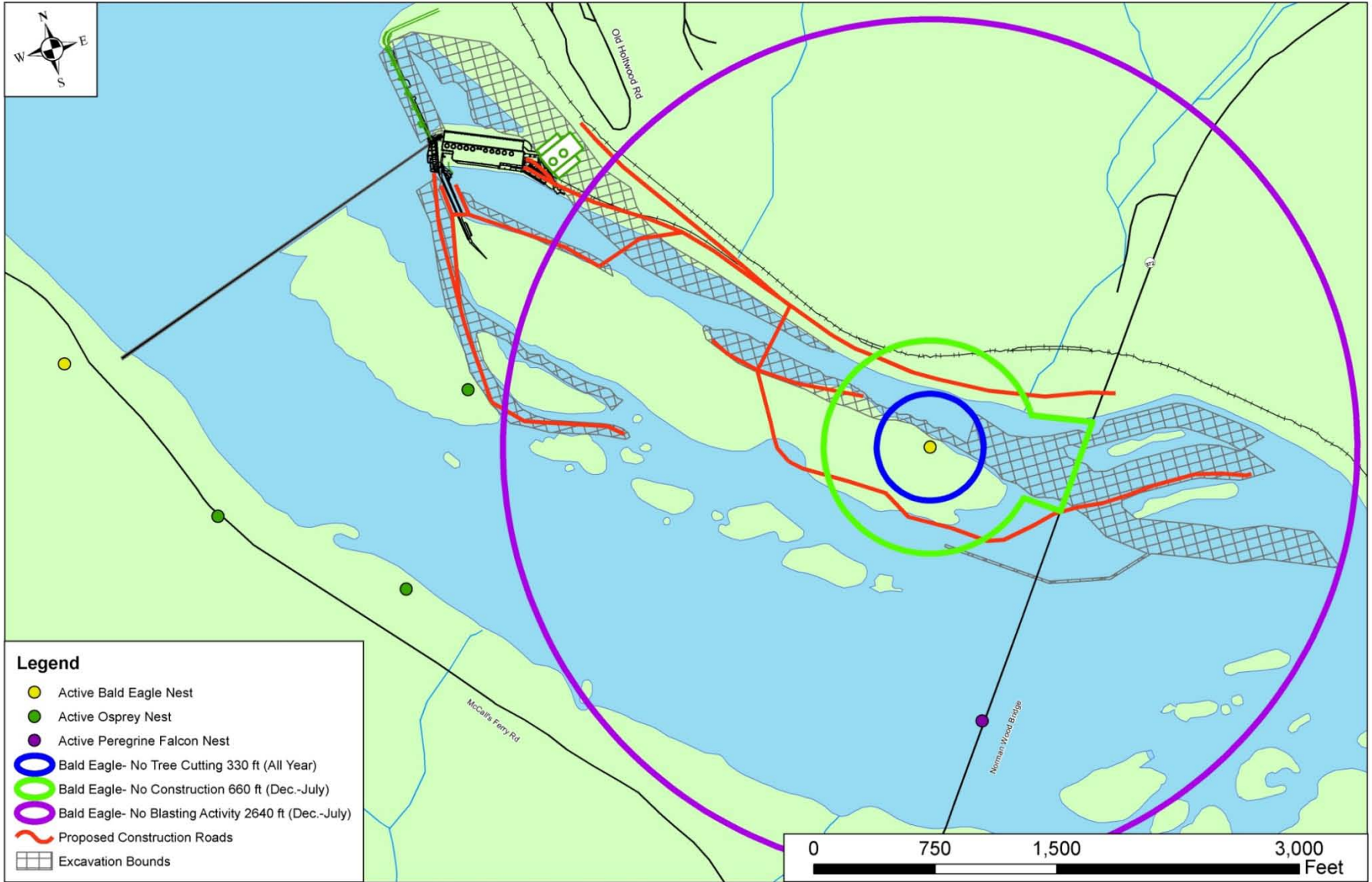
- No Longer Protected by Endangered Species Act
- Bald and Golden Eagle Protection Act
- Migratory Bird Treaty Act
- National Bald Eagle Management Guidelines
 - <330 Feet No Tree Clearing
 - <660 Feet No Visible Activities During the Nesting Season
 - <0.5 miles No Blasting

Category H- Activities

- Blasting and Other Loud, Intermittent Noises
- Avoid blasting within 1/2 mile
- ...unless greater tolerance to the activity (or similar activity) has been demonstrated...
- ...This recommendation applies to the use of fireworks classified by the Federal Department of Transportation as Class B explosives...

Bald Eagle Management

- <330 Feet No Tree Clearing
- <660 Feet No Visible Activities During the Nesting Season
- <0.5 miles No Blasting



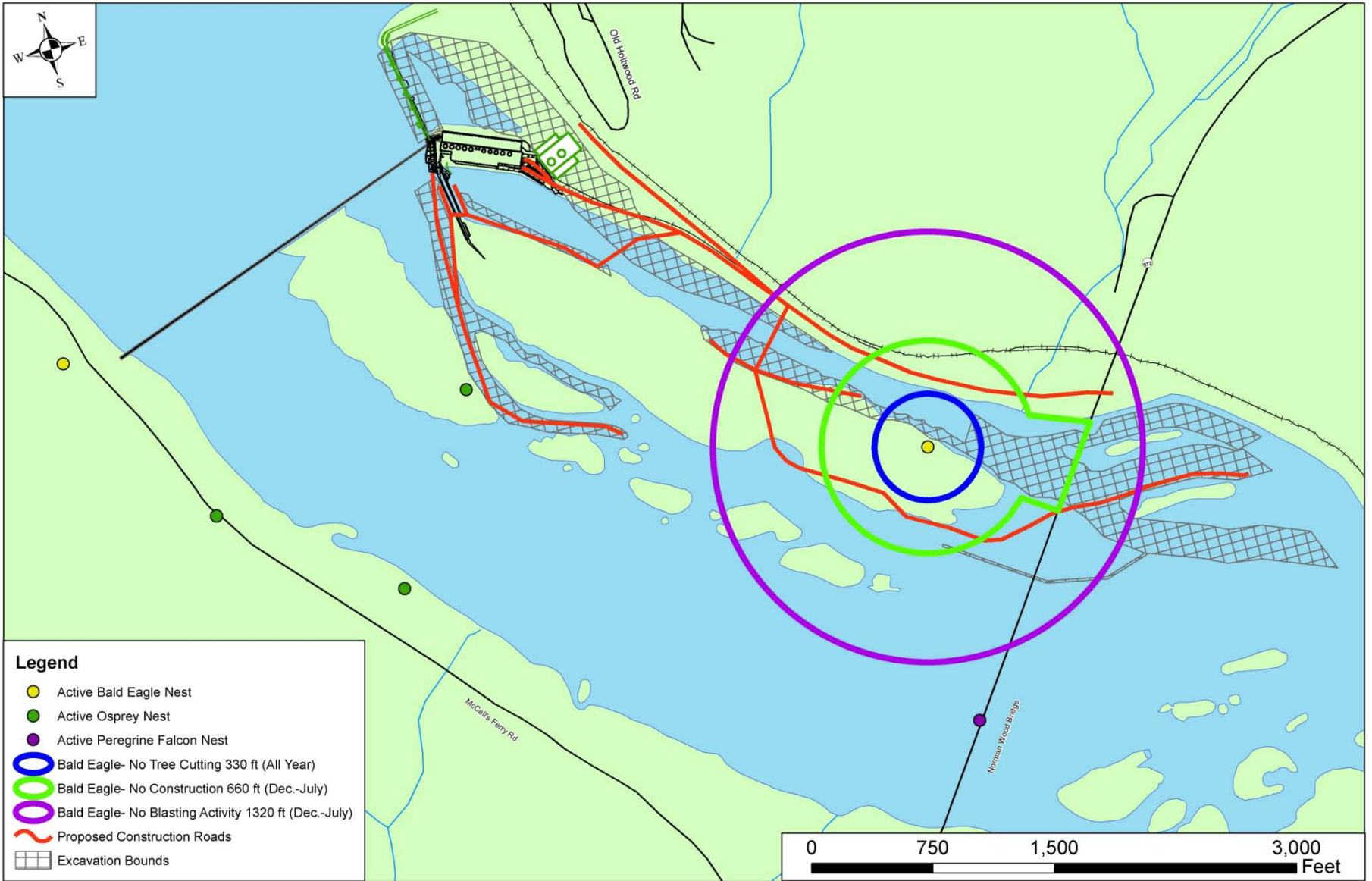
Blasting VS Aerial Explosives

- Blasting
 - Controlled
 - Underground



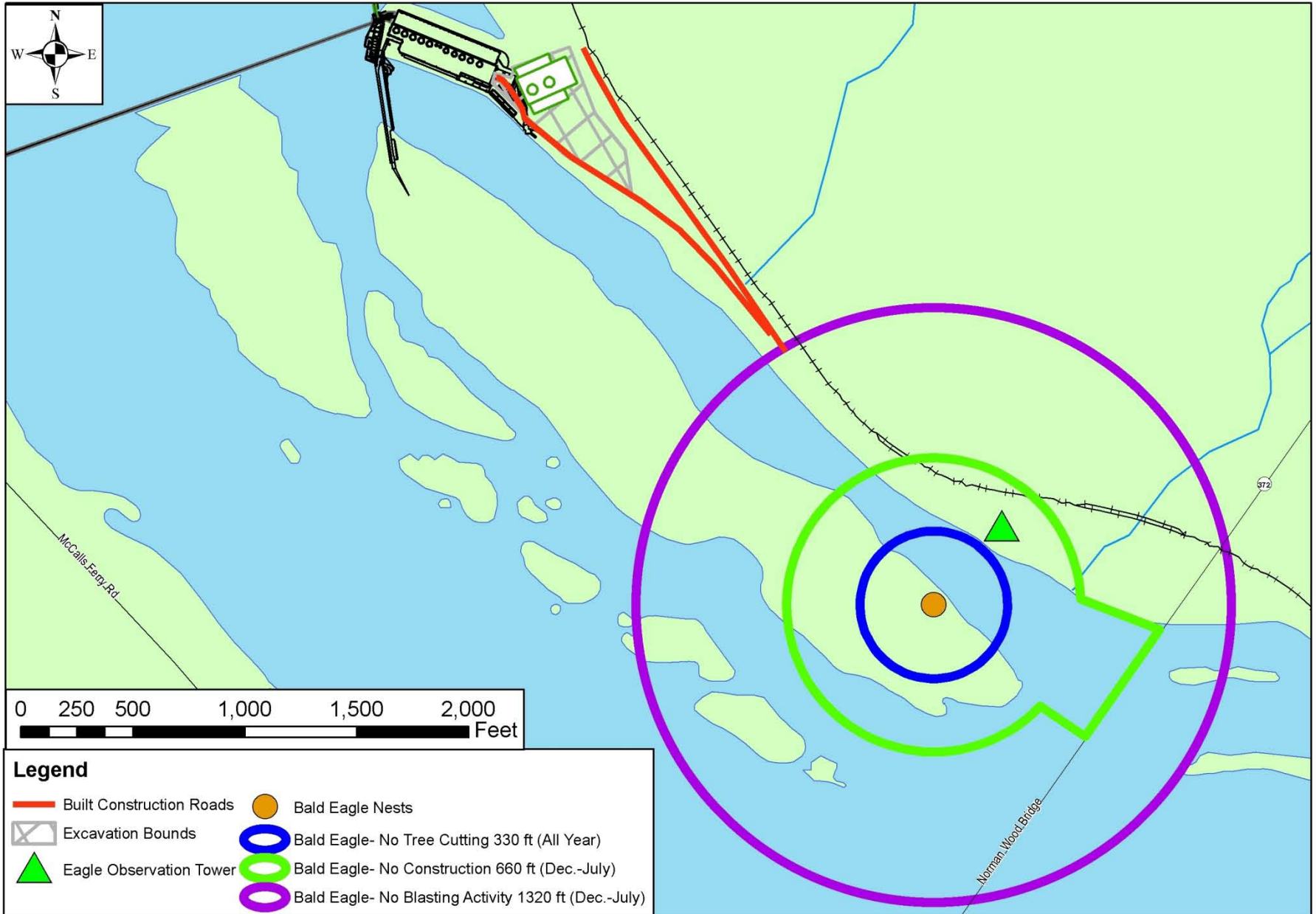
- Aerial Explosives
 - Visible
 - Above Ground





Holtwood Blasting

- <104 Decibels
- >0.25 Miles From Active Nests
 - Currently 0.5 miles from Active Nests
- Monitor Nearby Active Nests



- Legend**
- Built Construction Roads
 - Excavation Bounds
 - ▲ Eagle Observation Tower
 - Bald Eagle Nests
 - Bald Eagle- No Tree Cutting 330 ft (All Year)
 - Bald Eagle- No Construction 660 ft (Dec.-July)
 - Bald Eagle- No Blasting Activity 1320 ft (Dec.-July)

Antennae
Two Cameras
Sound Meter



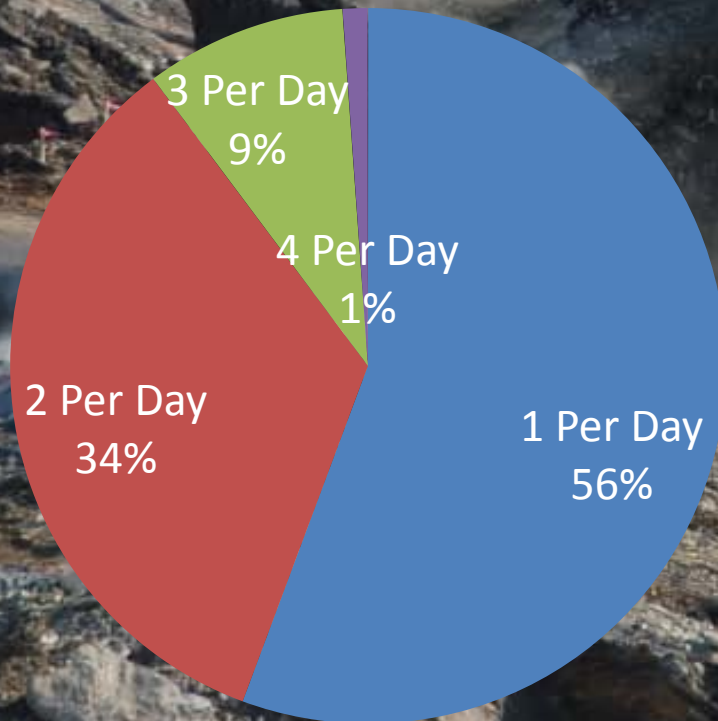
Monitoring

- Video- Behavioral Observations
- Audio- Decibel Recordings and Noise Analysis
 - A-weighted (Human Range)
 - Peak Decibels (Unfiltered)
- 30 minutes before and after each blast

1st Year Results

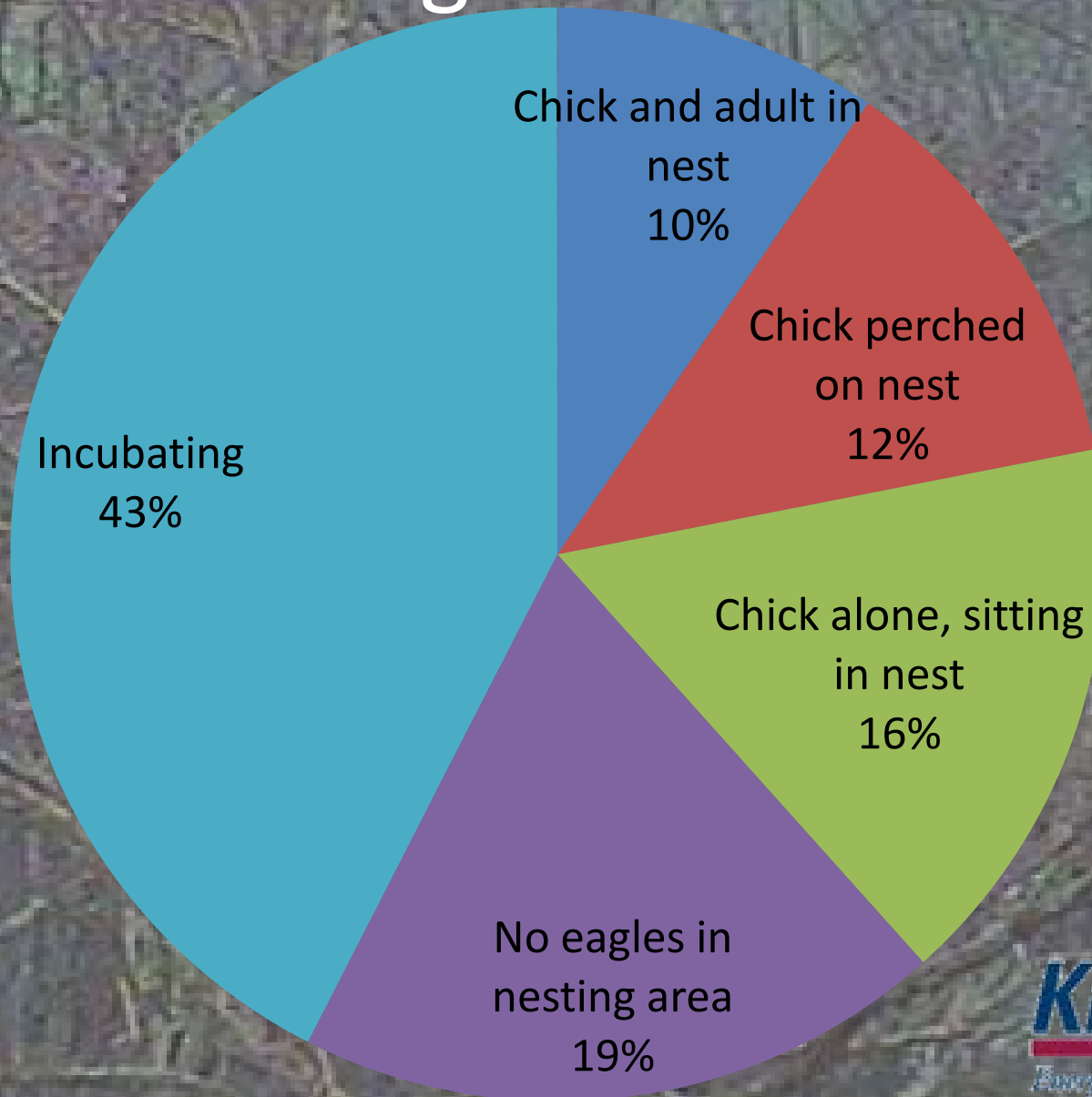
- Started Blasting in January
- Completed in June

Number of Blasts Per Day

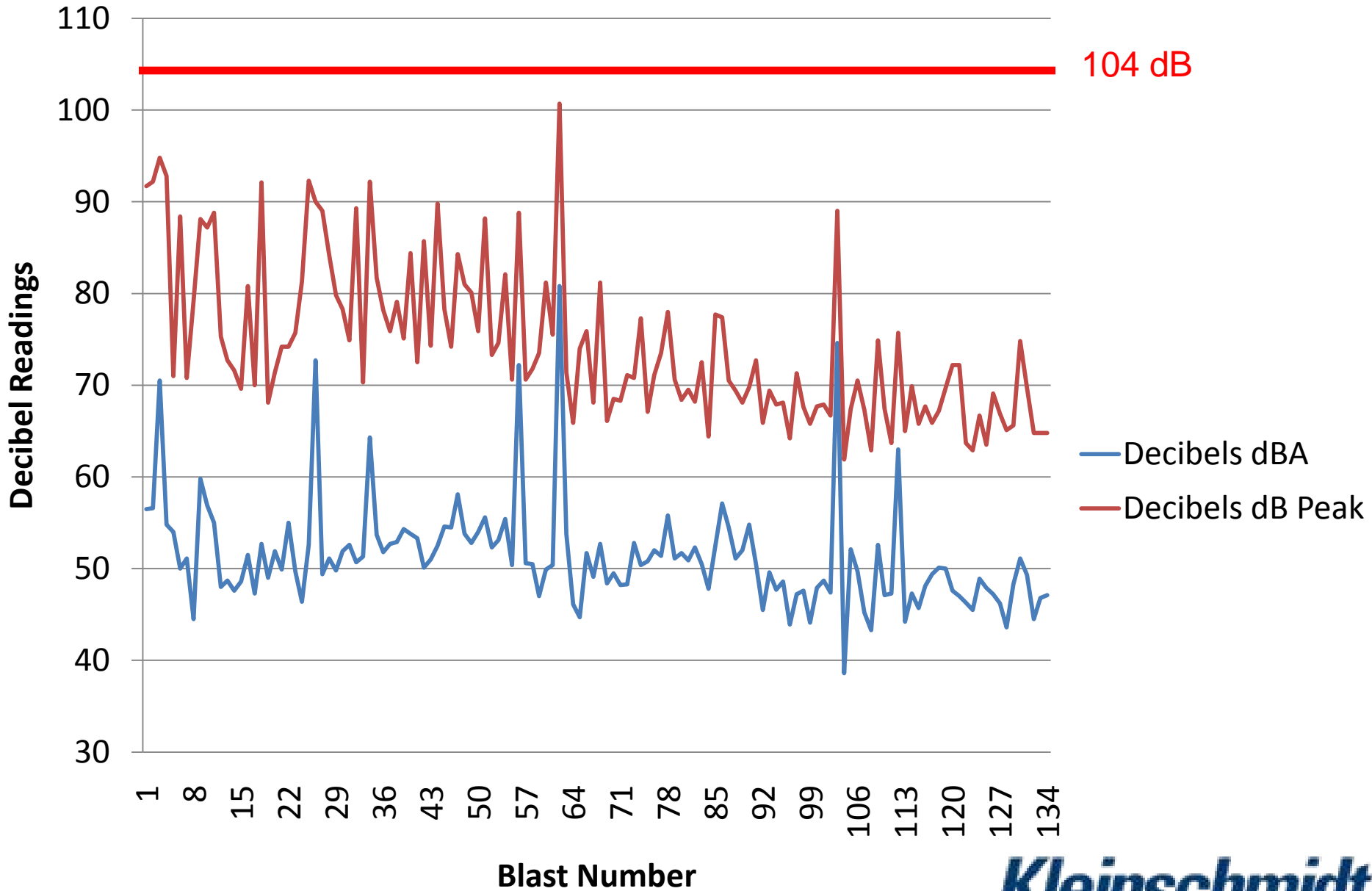


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Eagle Behavior



Decibel Readings at Blast Time



No Disturbance

- Construction Was Not Visible from the Nest
- Blasting Occurred at Approximately 0.5 miles
- Blasting was Slowly Increased
 - Number per day
 - Charge Size
- Peak Decibels were <104 dB

Implications for Eagle Management

- Future Blasting
 - Decreased Distance to the Active Nest
 - Continue Decibel Restrictions
- Recommendations
 - Maintain Visual Barriers
 - Continue Decibel Limitations
 - Time of Year
 - Habituation

Questions?

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