Bank Swallow colonies on Lake Erie

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Bank Swallows (*Riparia riparia*)

- Aerial insectivore
- Colonial
- Varied nesting habitat (lakes, rivers, streams, soil piles, sand/gravel quarries)
- Population declines

Photo: C. Artuso
Decline of Bank Swallows
Objectives

• Determine population size, distribution and density of breeding birds along a section of Lake Erie shoreline

• Determine habitat characteristics important in habitat selection, colony size and burrow occupancy levels
Study Area

- 120 km of shoreline (Rondeau to Turkey Point)
Field Methods

• Survey shoreline by boat
• Colony/Burrow counting
• Selected used (n=33) and unused banks (n=33)
• Measured bank characteristics
• Determined burrow occupancy
Habitat variables

• Reduced variables –
  • bank height
  • beach width
  • tree cover (above bank)
  • shrub cover (talus)
Results – burrow counts

• 127,533 burrows from 569 colonies
• Repeated counts varied by 1.6% on average

• 93% of burrows situated in upper bluff
• 7% of burrows situated in lower bluff
Upper bluff colonies
Lower bluff colonies – sand lenses
Burrow occupancy

- 51.1% (95% C.I., 44.4%, 57.8%)
- Error rate (Predicted false negatives) 14.4%
- 65.5% (127,355 burrows) = 83,417 active nests
Distribution and density
Surface Geology
Habitat selection

- Tree Cover (%) at bank edge
- 2.6% decrease in odds of a site being occupied given every 1% increase in tree cover
Colony size – burrow abundance

• Bank height

• For each 1 metre increase in bank height, colony size increased by 26%
Burrow occupancy

- Beach width
- For each 1 m increase in beach width, burrow occupancy levels increase by 6.7%
Population significance

- Lake Erie Bank Swallow population is likely the largest concentration of breeding Bank Swallows in the world.
- Important habitat – upper sand layer in bluffs – sand plain.
Limitations / Future work

- Unmeasured variables (e.g. Erosion, soil types)
  - e.g., interacting variables depending on site
- Lack knowledge of
  - temporal changes in abundance, density, distribution
  - large scale patterns in habitat selection
  - small scale population dynamics
- Sand and gravel pits – artificial habitats
- Roadkill mortality
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