Columbia River Estuary
Double-crested Cormorants:
Adaptive Research for
Adaptive Management?

USGS - Oregon Cooperative Fish & Wildlife Research Unit

Oregon State University

Real Time Research, Inc.
“The cormorant is a large black duck which feeds on fish... they increased in quantity as we decended, and formed much the greatest portion of the waterfowl which we saw on the Columbia until we reached tidewater where they also abound...”

Meriwether Lewis
March 7, 1806
Species Overview

- Historically abundant across much of its range
- 20th Century declines & recoveries
- Current population recovery since 1970’s
  - From DDT ban
  - Prohibition on take (MBTA listing in 1972)
- Piscivorous
- Pursuit-diver
- Relatively high reproductive potential
Double-crested Cormorant Colony Size on East Sand Island

Breeding Pairs


Average (2000-2008)
Columbia River Estuary
Double-crested Cormorant Smolt Consumption

Smolts consumed (millions)

Average (2001-2009)
Double-crested Cormorant Smolt Consumption by Species on East Sand Island

Smolts Consumed (millions)

- Steelhead
- Coho
- Yearling Chinook
- Sub-yearling Chinook

Smolt Mortality Rates Due to Double-crested Cormorant Predation in the Columbia River Estuary
Current Western Population ≈ 29,300 breeding pairs

Current Eastern Population > 300,000 breeding pairs
# Number of Breeding Pairs at Marine and Estuarine Colony Sites

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</thead>
<tbody>
<tr>
<td><strong>British Columbia</strong></td>
<td>1,981</td>
<td>-</td>
<td>403</td>
<td>-80%</td>
</tr>
<tr>
<td><strong>Washington</strong></td>
<td>-</td>
<td>1,618</td>
<td>788</td>
<td>-51%</td>
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<tr>
<td><strong>Oregon</strong></td>
<td>-</td>
<td>5,087</td>
<td>14,730</td>
<td>+190%</td>
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<tr>
<td><strong>California</strong></td>
<td>-</td>
<td>5,092</td>
<td>4,994</td>
<td>-2%</td>
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Note: The data for 1987 is from Moul & Gebauer (2002), and the data for 1989-1992 is from Carter et al. (1995). The data for 2008-2009 is from a recent study.
Tagging of Double-crested Cormorants on East Sand Island
Connections to the Pacific Region

- Roosted at locations near northern and southern extremes of breeding range of Western Population
- Remained largely coastal
- Almost no movement east of the Cascades
- No movement to interior states
- Little movement to southern California
Connections to other Colony Sites

Current & Historic Breeding Colonies

Colonies used by Tagged DCCOs
Potential Management Approach: Attraction to Desired Sites

Setup:

Result:
Potential Management Approach: Attraction to Desired Sites

Setup:

Result:
Potential Management Approach: Dissuasion from Undesired Sites
Conclusions

• Cormorants consume millions of juvenile salmonids annually

• Impacts of cormorants on some salmonids now exceeds that of terns

• Columbia River estuary cormorant population is stronghold for species on west coast

• Connections between Columbia River estuary and other cormorant colonies on west coast
Conclusions

• Cormorants are potentially amenable to adaptive management techniques used for terns
  • Attraction to alternative sites may be more difficult because habitat not as limiting
  • Passive habitat modification to dissuade nesting may be more expensive than for terns
• NEPA process to evaluate potential management beginning
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