

Introduced mink and inclement weather negatively affect ground-nesting songbird nesting in sub-Antarctic *Nothofagus* forests, Chile

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Introduction

- The American mink (*Mustela vison*) was introduced to Tierra del Fuego Island to begin a fur trade in the 1940's.
- Native birds in some parts of the archipelago, including Navarino Island, evolved without terrestrial predators.
- Consequently, many songbird species nest on the ground that on the continent use trees.
- Island ecosystems are extremely vulnerable to introduced species.
- A conservation concern, therefore, is understanding whether the mink could render the birds defenseless against a new predator, thus affecting their populations.
- Here we investigate whether the mink has an effect on several two species of ground-nesting song birds: the austral thrush (*Turdus falcklandii*) and rufous-collared sparrow (*Zonotrichia capensis*).

Study Site

- Study sites were located on the north coast of Navarino Island (55°S) in the Cape Horn Biosphere Reserve, Chile (Figure 1).

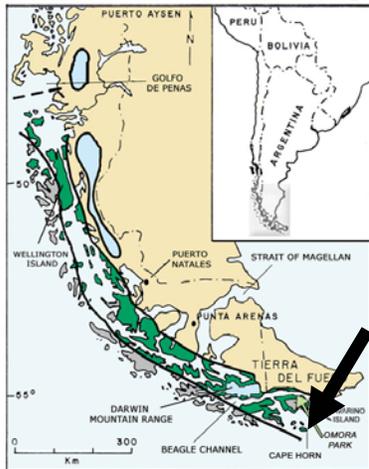


Figure 1: Map of southern South America with sub-Antarctic forests in green and the study area indicated by the arrow.

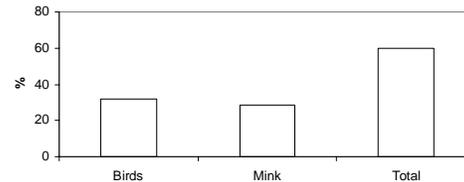
- The area is part of the sub-Antarctic *Nothofagus* forest biome.
- Four habitats were used: anthropogenic shrublands, beaver meadows, secondary forests, and virgin forests.

Methods

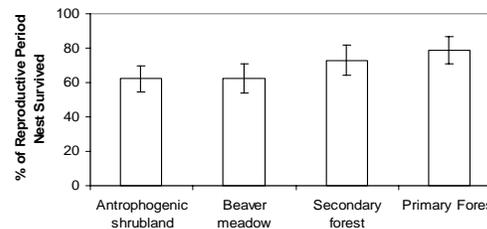
- 60 artificial nests were used with 15 nests per habitat type.
- Three blue plasticine eggs were used per nest to standardize clutch size and mimic natural egg color.
- Nests were checked every three days for 30 days.
- Nests were deemed depredated if the eggs were missing, bitten, pecked, or scratched.
- A total of 7 natural nests of three species of ground-nesting songbirds were almost monitored in the same manner.

Results

Nest Failures by Type of Predator



1. Thirty-six out of fifty artificial nests were depredated, and seventeen of those were by the mink. Nest failure was highest in human and beaver-disturbed habitats and lowest in primary forests.

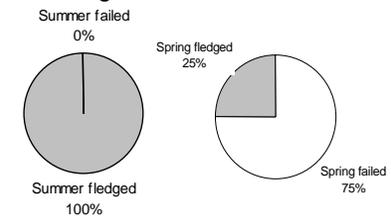


2. The primary forest had the greatest survival time (portion of reproductive period nest remained alive) of all habitats at 79%, while nests in secondary forest on average survived for 73% of the reproductive period, and anthropogenic shrubland and beaver meadows were 63%.



Figure 2: An artificial nest used in the study, mimicking color and location of natural nests and eggs.

3. Of the natural nests, three failed in the spring due to inclement weather. No nests failed in the summer due to inclement weather. One nest fledged in the spring, and three nests fledged in the summer.



Conclusions

- Biodiversity is threatened globally by introduced species.
- We have shown that the mink has the capability to negatively impact bird populations on Navarino Island.
- Human-disturbed habitat and introduced species, like the beaver, enhanced mink depredation of nests on Navarino Island.
- Not only are the mink a predator but birds, possibly a wren type bird are also significant potential nest predators.
- At least in spring, the threat of inclement weather, such as late snows or heavy rains, also appear to be significant natural factors affecting nest success in ground-nesting songbirds.

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