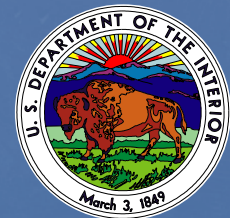


South Farallon Islands Invasive House Mouse Eradication Project

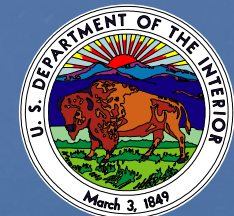
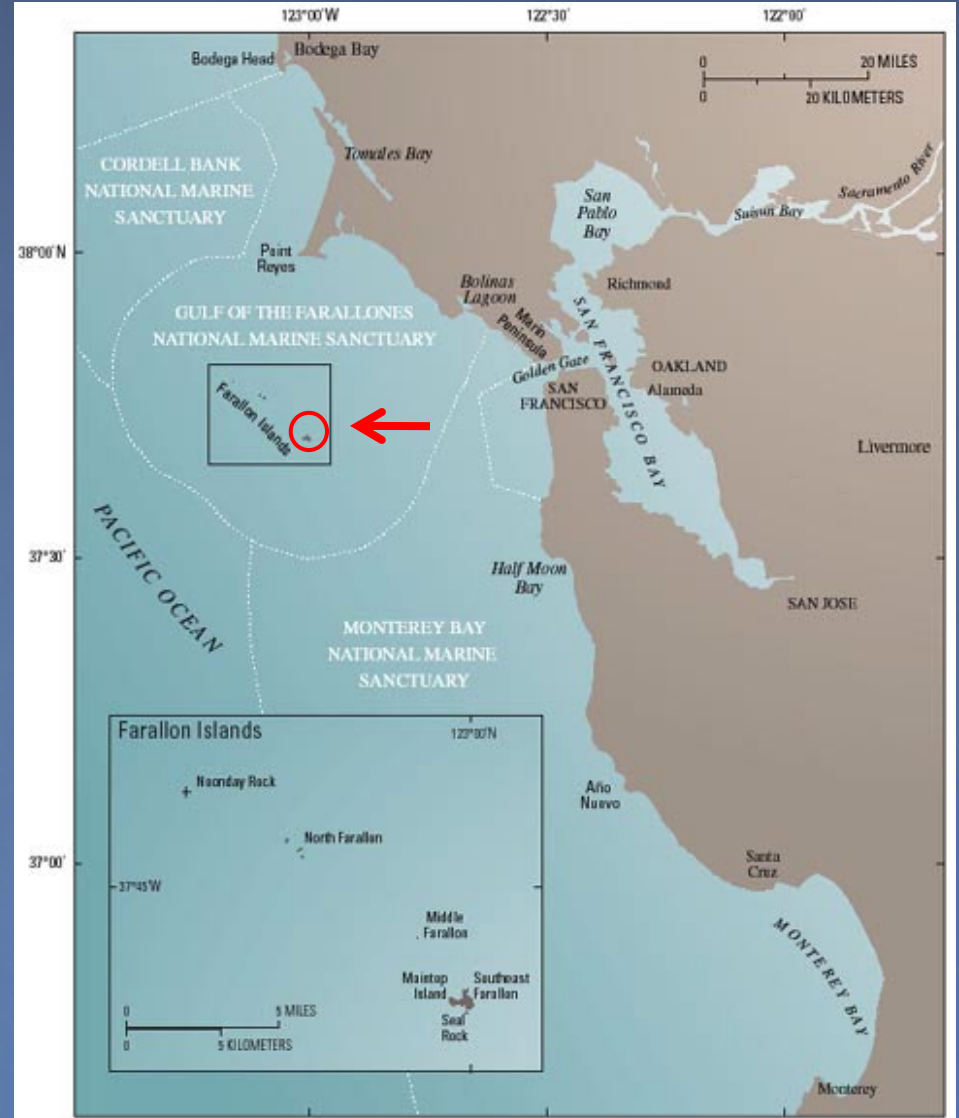
Gerry McChesney
Farallon Islands National Wildlife Refuge

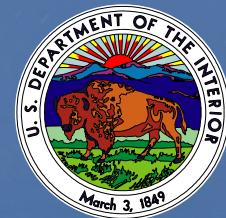
October 21, 2019

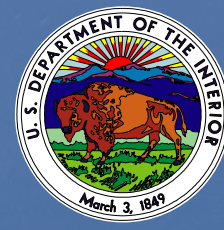


Location of the South Farallon Islands, California

Approx. 30 miles west of San Francisco







South Farallon Islands

Brandt's Cormorant



Ashy Storm-Petrel



Western Gull



Tufted Puffin



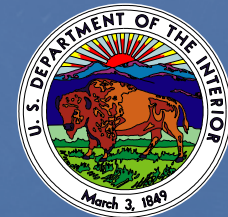
Common Murre



Northern Elephant Seal

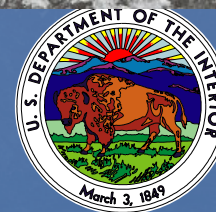


Steller Sea Lion





House Mouse Introduction



House Mouse Ecosystem Impacts

Ashy Storm-Petrel



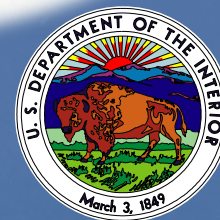
Maritime
goldfield



Farallon arboreal
salamander

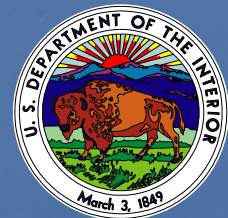


Farallon camel
cricket



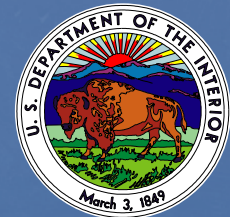
Project Purpose and Need

Eradicate invasive house mice (*Mus musculus*) from the South Farallon Islands in order to *eliminate* their negative impacts on the native ecosystem of the Farallon Islands National Wildlife Refuge while minimizing impacts to non-target resources.



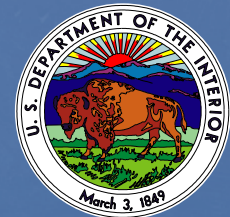
Project History

- Feasibility Study: 2004
- EA Public Scoping: 2006
- Comprehensive Conservation Plan: 2009
- EIS Pubic Scoping: 2011
- Draft EIS and public comments: 2013
 - 553 public and agency correspondences received
- Final EIS published: March 2019
- Section 7 ESA (black abalone) and Essential Fish Habitat concurrences obtained: April 2019



Environmental Impact Statement

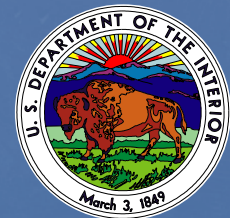
- ❑ 49 potential methods initially examined, including:
 - Rodenticide, mechanical, and theoretical
- ❑ 3 alternatives analyzed:
 - No action (status quo)
 - Aerial broadcast of Brodifacoum-25D Conservation
 - Aerial broadcast of Diphacinone-50 Conservation



Rationale for the Preferred Alternative

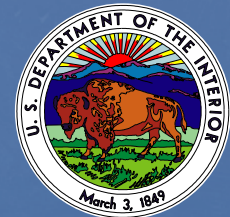
Alternative B: Aerial broadcast of Brodifacoum-25D Conservation

- Mouse impacts need to be eliminated
- Brodifacoum-25D Conservation has the highest likelihood of eradication success
- Eradication can be completed in a ~5-week operation
- Protective measures will reduce impacts to non-target resources



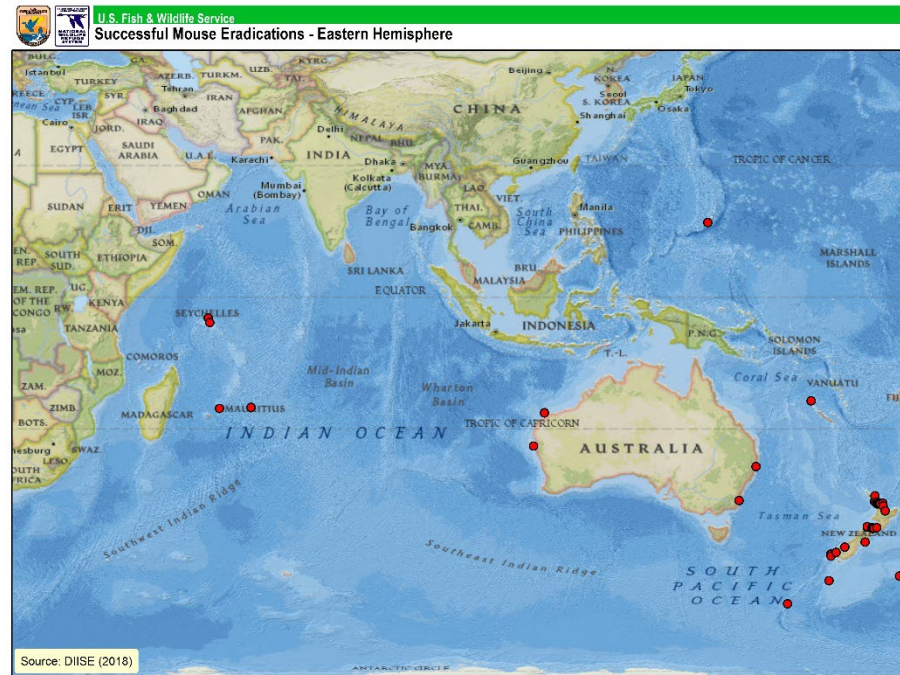
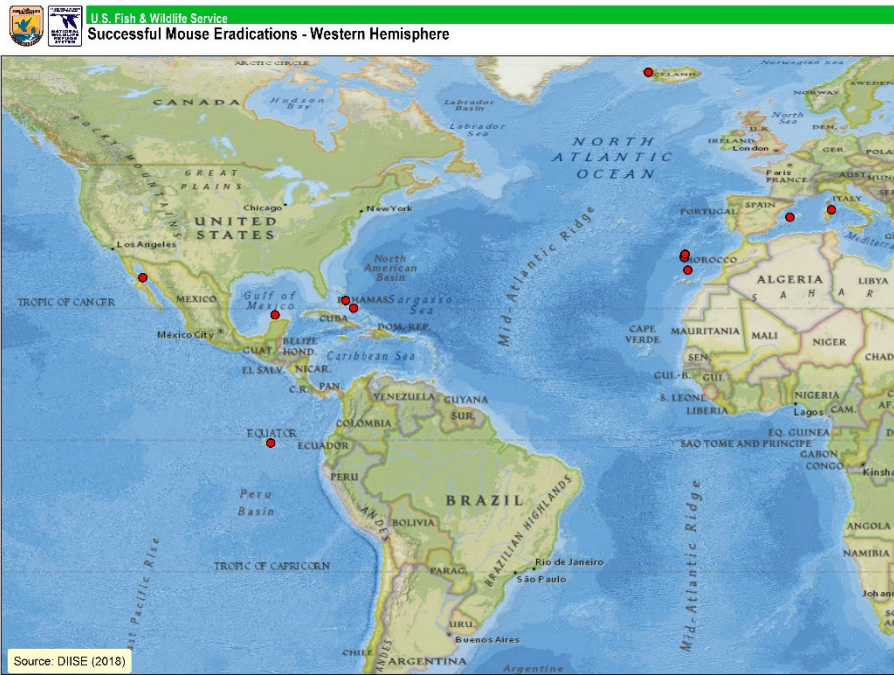
Successful Rodent Eradications

- ❑ >600 successful rodent eradications worldwide
- ❑ 5 eradications in U.S. (all rats):
 - Anacapa Island (Channel Islands NP)
 - Midway Atoll NWR
 - Rat Island (Alaska Maritime NWR)
 - Palmyra Atoll NWR
 - Desecheo NWR

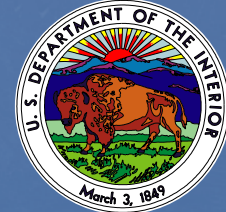


House Mouse Eradications

- ❑ 57 successful mouse eradications worldwide since 1971.
- ❑ Near 100% successful since 2007 (at least 28 of 32 attempts)

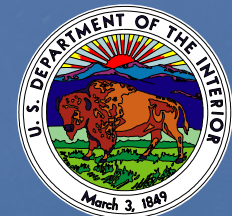


Source: Database of Island Invasive Species Eradications (2018)



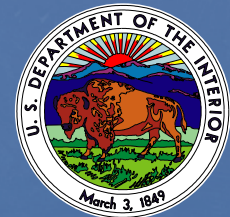
Environmental Impacts

- ❑ Long-term, significant positive ecosystem impacts, including:
 - Ashy and Leach's storm-petrels
 - Endemic Farallon arboreal salamander
 - Endemic Farallon camel cricket
 - Native plants such as the maritime goldfield
 - Wilderness quality



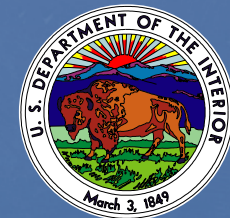
Environmental Impacts (con't)

- Short-term (weeks), non-significant adverse impacts to non-target species such as the western gull from exposure to brodifacoum.
- Short-term closure (few days; not significant) of recreational shark diving ventures during aerial applications.



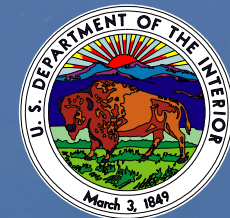
Minimizing Impacts to Non-Target Resources

- Seasonal timing



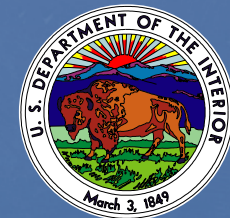
Minimizing Impacts to Non-Target Resources

- Seasonal timing
- Gull hazing



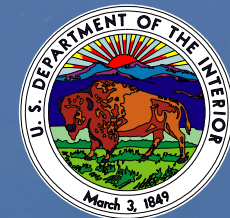
Minimizing Impacts to Non-Target Resources

- Seasonal timing
- Gull hazing
- Capture birds of prey



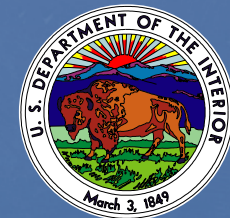
Minimizing Impacts to Non-Target Resources

- Seasonal timing
- Gull hazing
- Capture birds of prey
- Capture salamanders



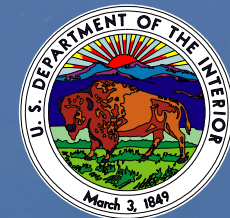
Minimizing Impacts to Non-Target Resources

- Seasonal timing
- Gull hazing
- Capture birds of prey
- Capture salamanders
- **Precision bait delivery**



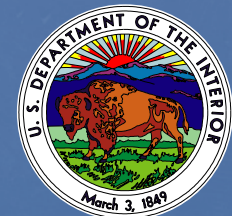
Minimizing Impacts to Non-Target Resources

- Seasonal timing
- Gull hazing
- Capture birds of prey
- Capture salamanders
- Precision bait delivery
- **Carcass removal**



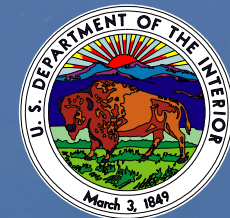
Minimizing Impacts to Non-Target Resources

- Seasonal timing
- Gull hazing
- Capture birds of prey
- Capture salamanders
- Precision bait delivery
- Carcass removal
- **Monitoring**



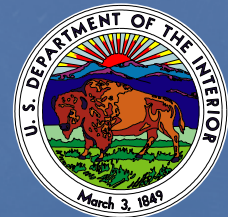
Minimizing Impacts to Non-Target Resources

- Seasonal timing
- Gull hazing
- Capture birds of prey
- Capture salamanders
- Precision bait delivery
- Carcass removal
- Monitoring
- Contingency plans



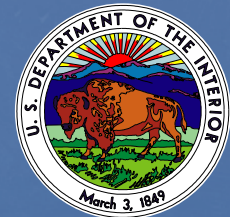
Timeline

- Submit revised Coastal Consistency Determination (CCD):
Winter 2019-20



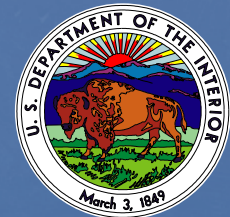
Timeline

- ❑ Submit revised Coastal Consistency Determination (CCD):
Winter 2019-20
- ❑ Coastal Commission hearing: Spring 2020



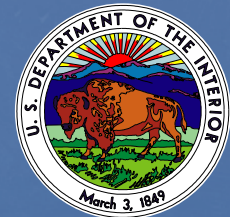
Timeline

- ❑ Submit revised Coastal Consistency Determination (CCD): Winter 2019-20
- ❑ Coastal Commission hearing: Spring 2020
- ❑ Record of Decision: Immediately following CCD obtained



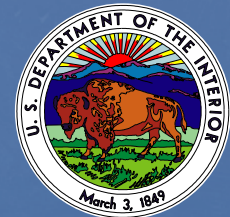
Timeline

- ❑ Submit revised Coastal Consistency Determination (CCD): Winter 2019-20
- ❑ Coastal Commission hearing: Spring 2020
- ❑ Record of Decision: Immediately following CCD obtained
- ❑ Obtain remaining permits : Winter 2019-20 – Spring 2022



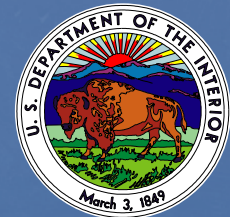
Timeline

- ❑ Submit revised Coastal Consistency Determination (CCD): Winter 2019-20
- ❑ Coastal Commission hearing: Spring 2020
- ❑ Record of Decision: Immediately following CCD obtained
- ❑ Obtain remaining permits : Winter 2019-20 – Spring 2022
- ❑ Fundraising for implementation: Winter 2019-20 – Spring 2022



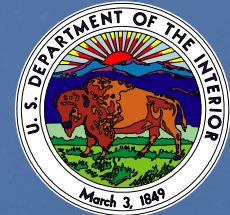
Timeline

- ❑ Submit revised Coastal Consistency Determination (CCD): Winter 2019-20
- ❑ Coastal Commission hearing: Spring 2020
- ❑ Record of Decision: Immediately following CCD obtained
- ❑ Obtain remaining permits : Winter 2019-20 – Spring 2022
- ❑ Fundraising for implementation: Winter 2019-20 – Spring 2022
- ❑ Project implementation: Fall 2022



Permits/Authorizations Needed

- ✓ Wilderness Act (WA) – Minimum Requirements Analysis
- ✓ Endangered Species Act (ESA) – Section 7 black abalone
- ✓ Essential Fish Habitat (EFH)
- Coastal Zone Management Act (CZMA) - Consistency
- Marine Mammal Protection Act (MMPA) - IHA
- Clean Water Act (CWA) - NPDES for Aerial Applications
- Migratory Bird Treaty Act (MBTA) – Translocation, housing
- National Historic Preservation Act (NHPA) – Section 106
- Federal Insecticide Fungicide and Rodenticide Act (FIFRA)
- National Marine Sanctuary – Manager's Permit



Thank you!

