

Adaptive management of Western Snowy Plovers at Coal Oil Point Reserve



Kevin Lafferty, USGS

**Coal Oil Point Reserve
University of California
Natural Reserve System**



RESEARCH

A study of disturbance

- Why study disturbance?
- Project goals
 - Sources of disturbance
 - Rates of disturbance
 - Management model

Lafferty, K. D. 2001. Birds at a Southern California beach: seasonality, habitat use and disturbance by human activity. *Biodiversity and Conservation* **10**:1949-1962.

Lafferty, K. D. 2001. Disturbance to wintering western snowy plovers. *Biological Conservation* **101**:315-325.

Lafferty, K. D., D. Goodman, and C. P. Sandoval. 2006. Restoration of breeding by snowy plovers following

QuickTime™ and a
decompressor
are needed to see this picture.

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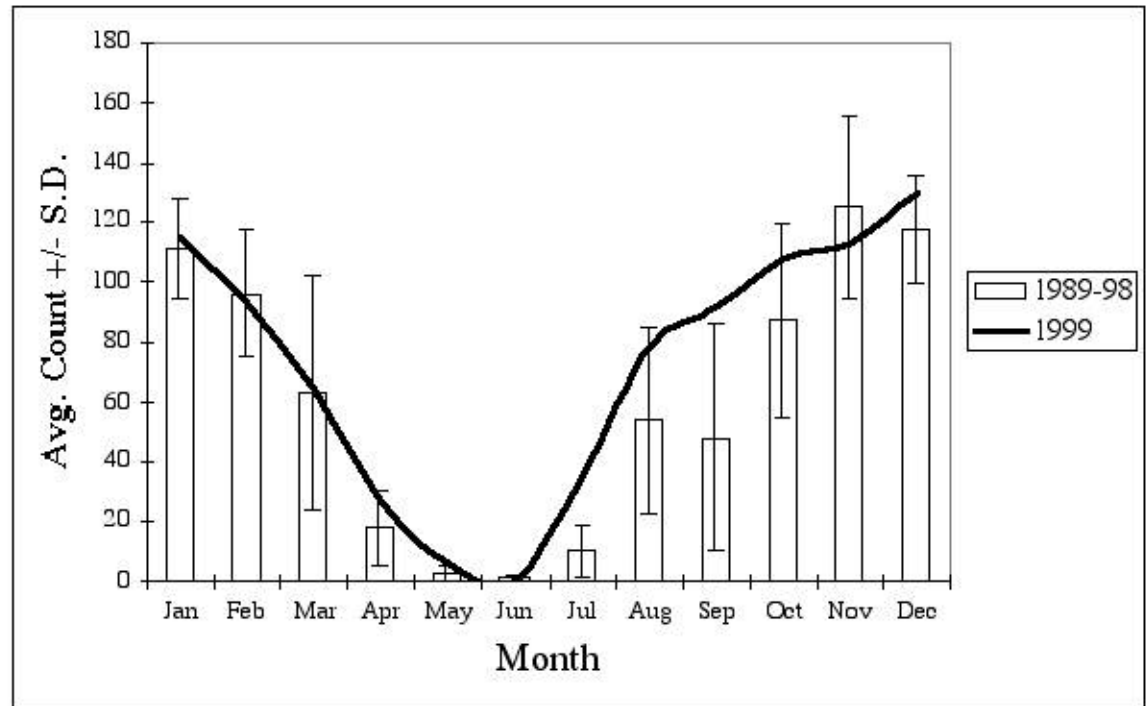
QuickTime™ and a
decompressor
are needed to see this picture.

COAL OIL POINT POPULATION

- Up to 150 wintering birds
- No successful breeding for 30 years
- Public access
- No previous plover management
- Research initiated in 1999
- Management actions implemented in 2001



Devereux Slough Plover counts



Wintering roost





- **Who uses the beach?**

- 72% are students
- 7 visits / mo. for 2 yrs

- **Awareness**

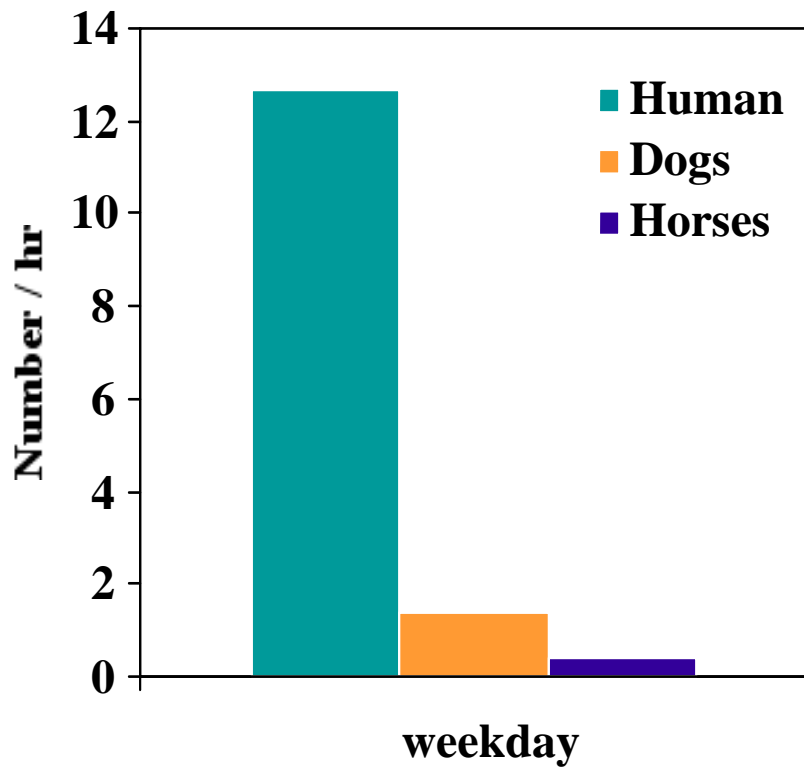
- 98% could not identify a snowy plover
- 67% did not know the area was a reserve

- **What do they do?**

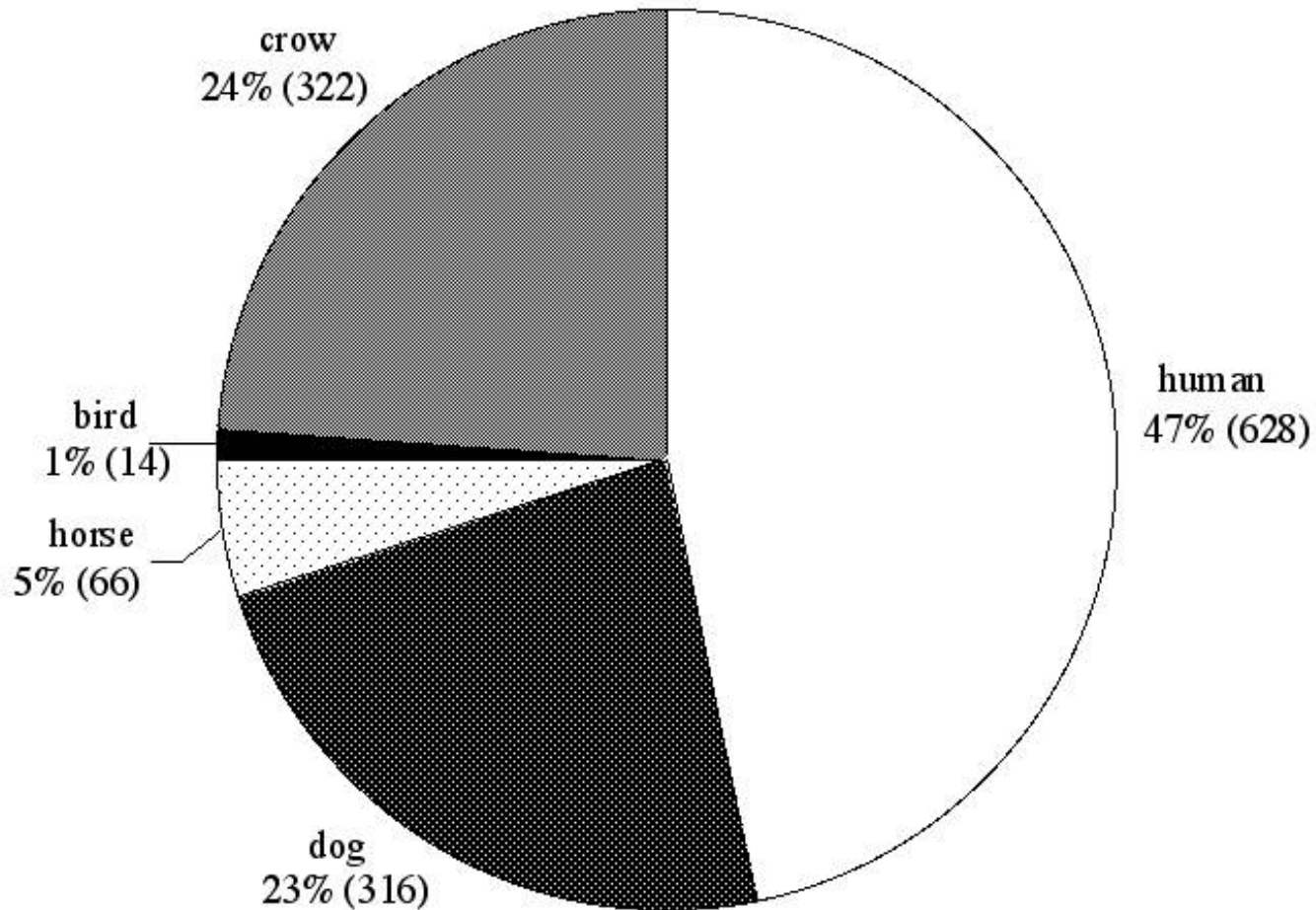
- 85% walk
- 68% jog
- 46% sunbathe
- 38% surf
- 21% watch sunset
- 20% party
- 15% beach cleanup
- 14% dog walk
- 13% bird watch
- 12% painting
- 12% ride horses

Disturbance

- Who enters the roost area?



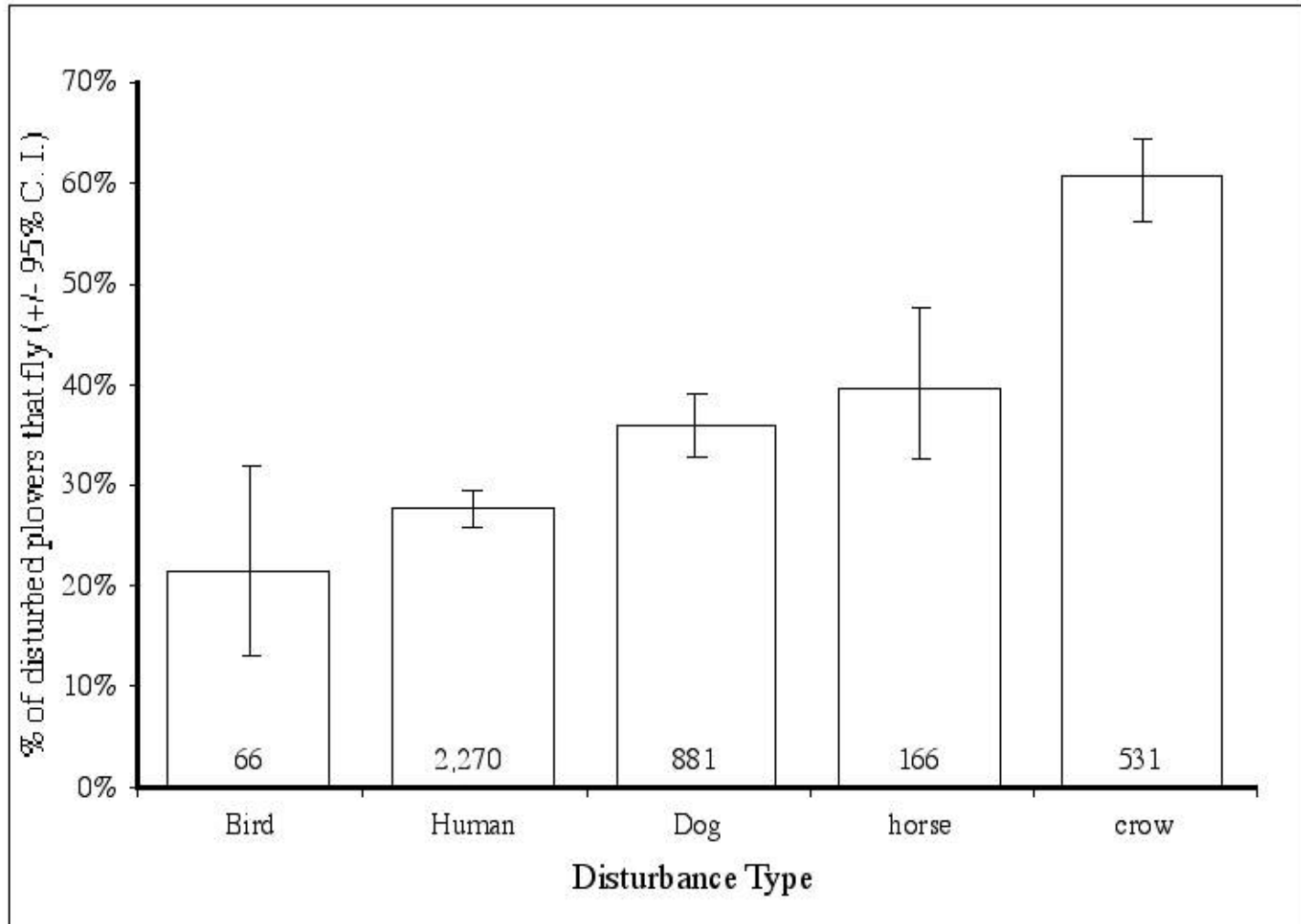
Who disturbs plovers?



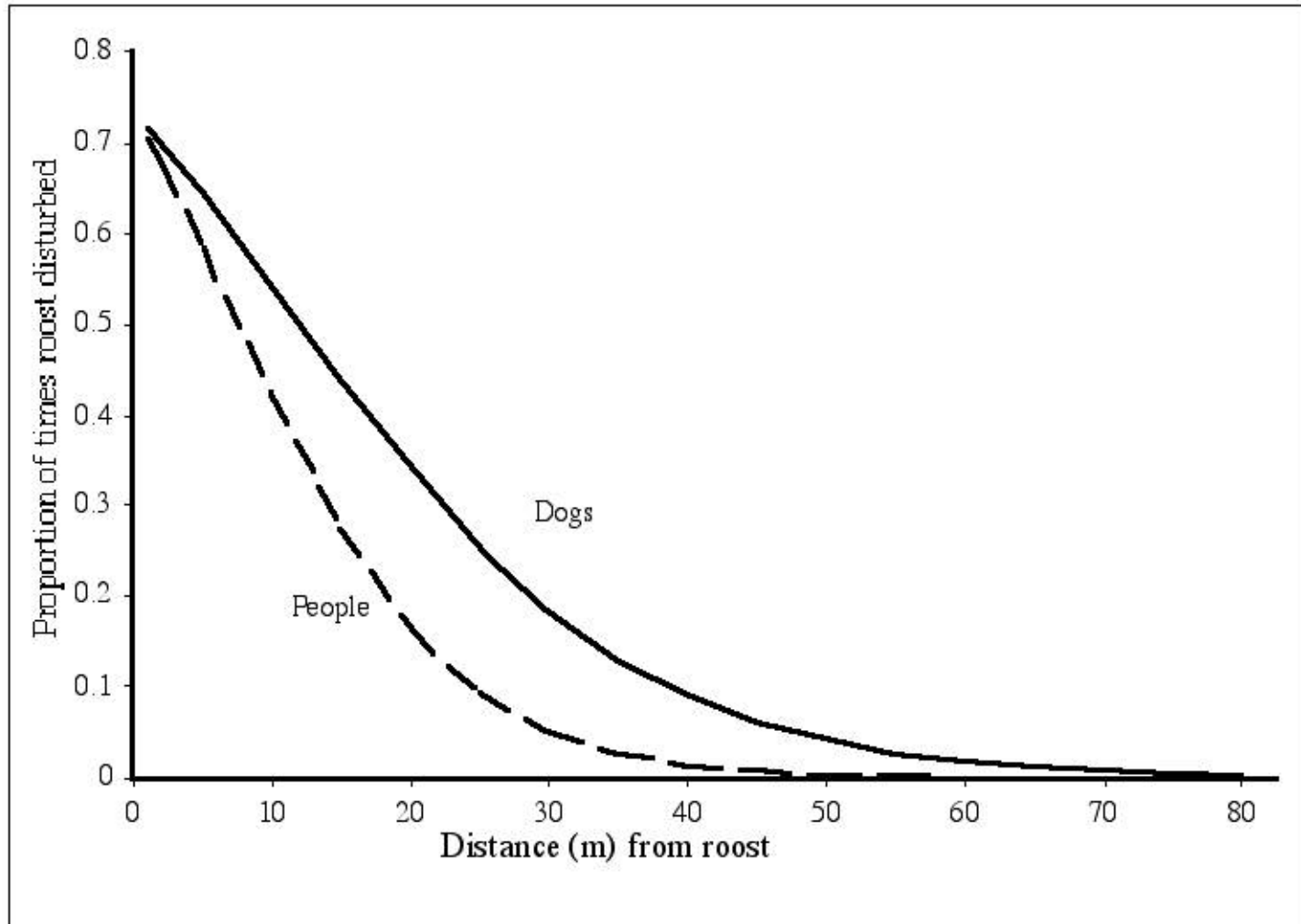
Before management

- How much disturbance does each plover experience?
 - Weekday: every 43 min.
 - Weekend: every 27 min.
 - 16 times higher than at protected beaches

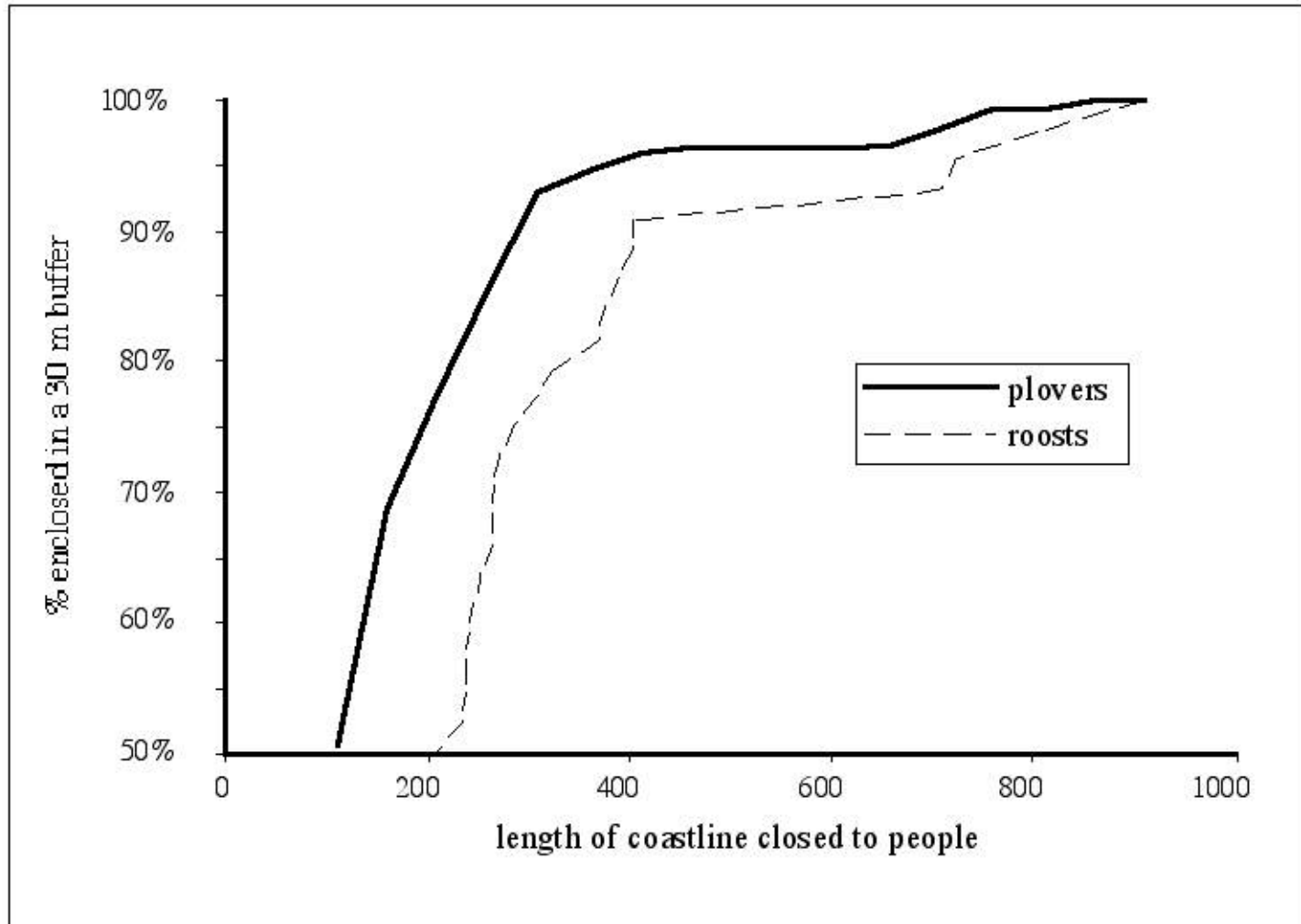
- What are plovers sensitive to?



- How does sensitivity decrease with distance?



- What length of upper beach needs to be closed?



MANAGEMENT

Management actions



- Restoration of dunes
- Close delta trail
- Rope roost area

- Place signs
- Initiate a docent program

Signs



Closure of delta trail



Rope fence: Summer



Rope fence: Winter



Docent Program

- Education
- Compliance (leash law, trespassing)
- Scare crows from nests



Training:

Classroom



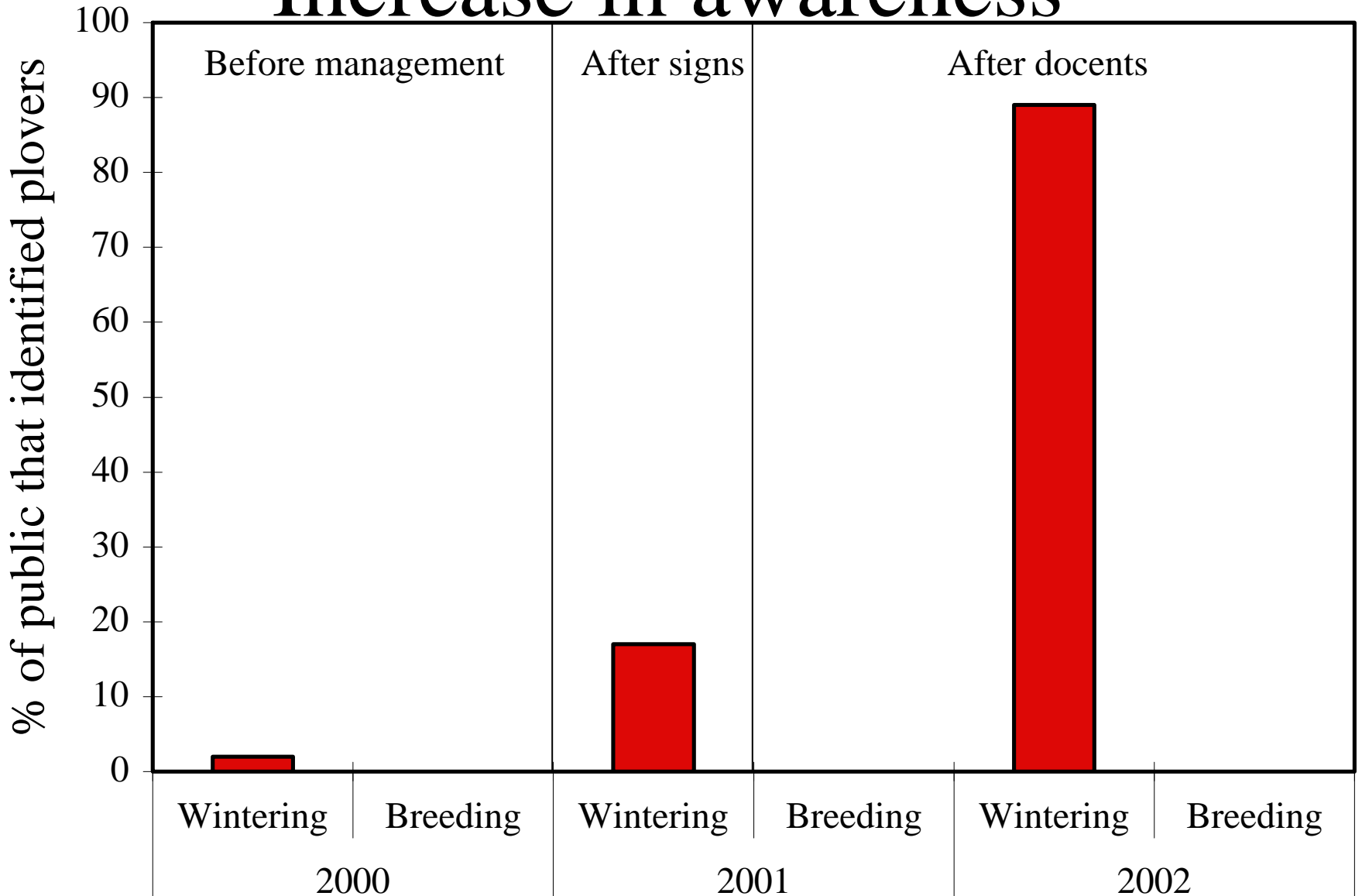
On site/individual



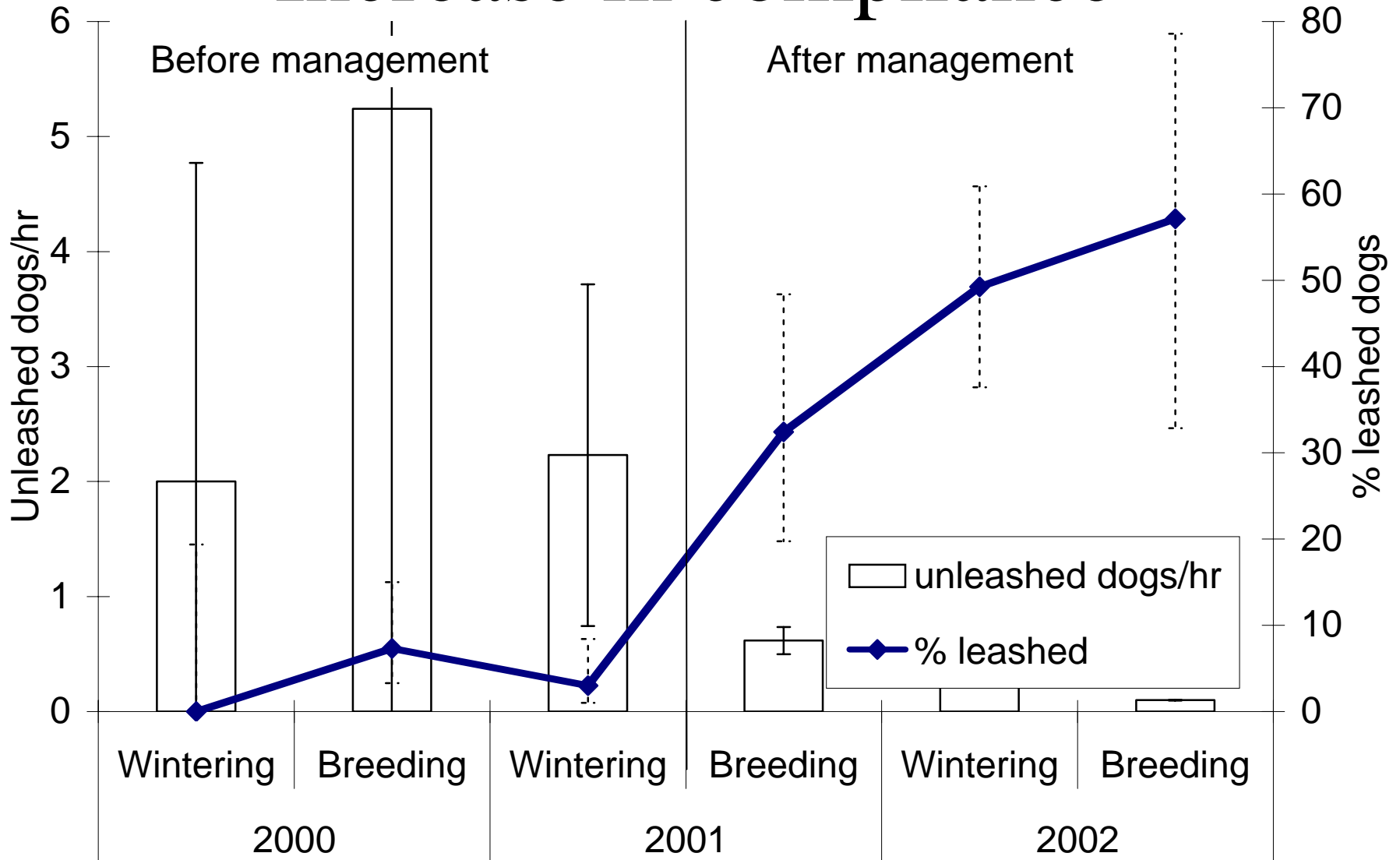
Sunrise to sunset during breeding
1/2 time during wintering

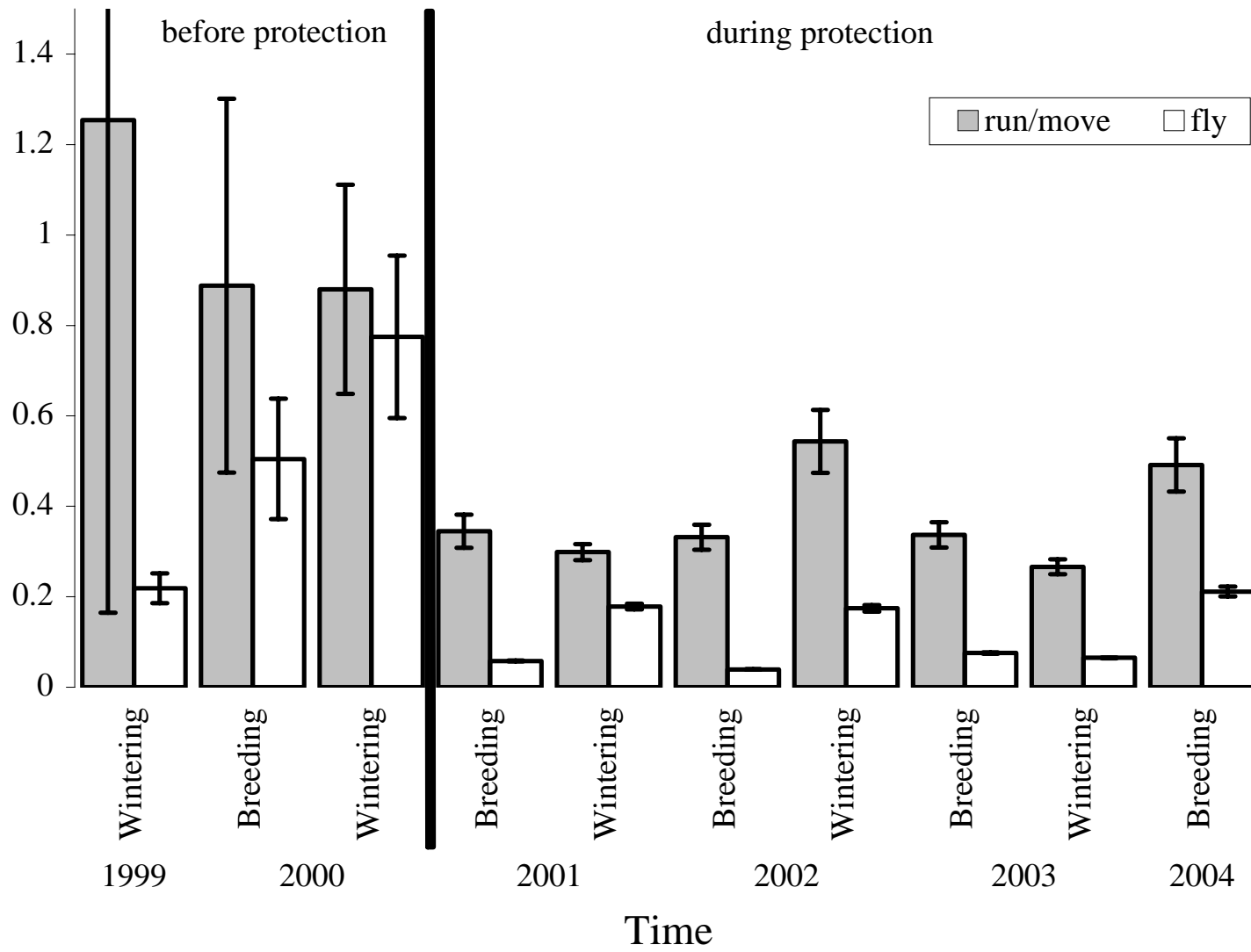
RESULTS

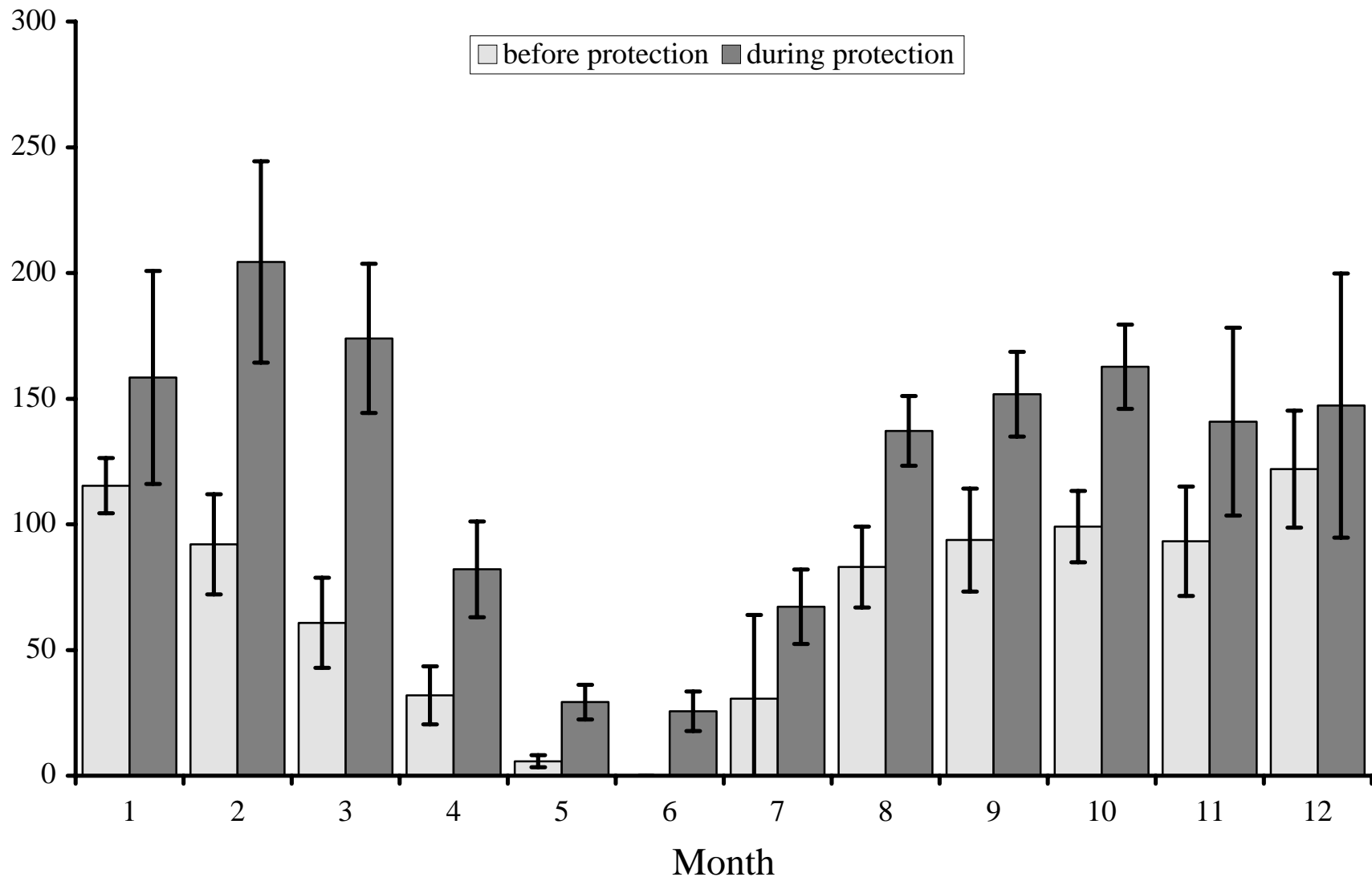
Increase in awareness



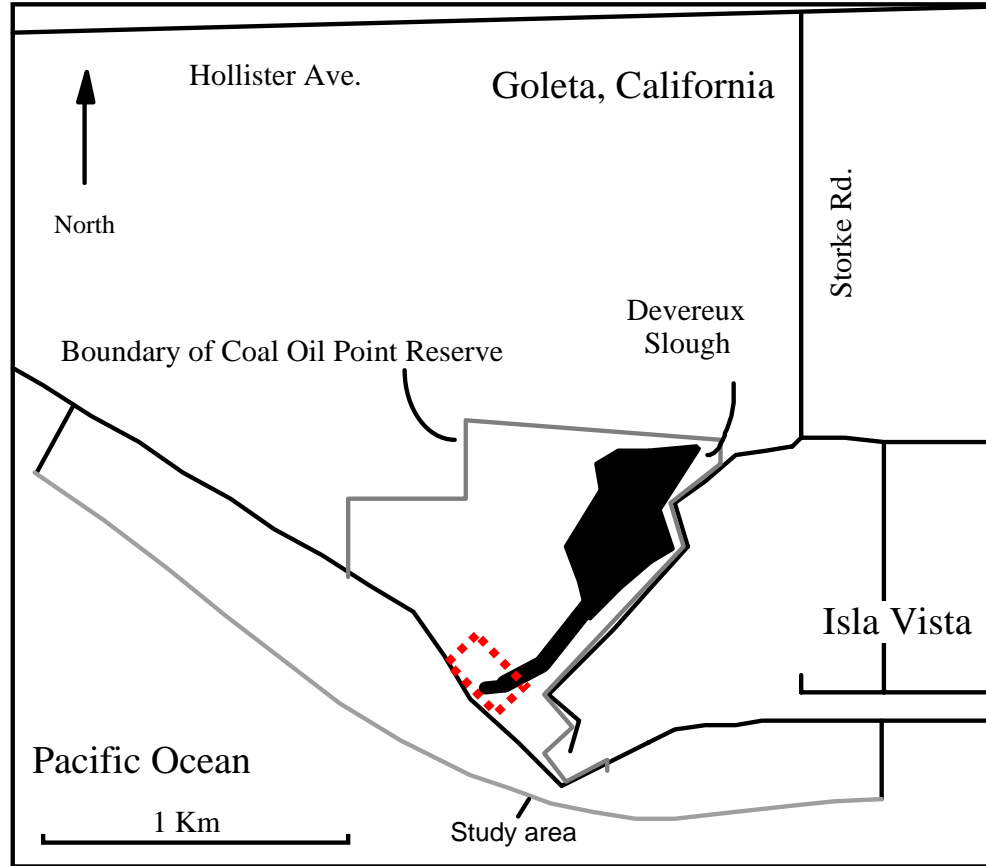
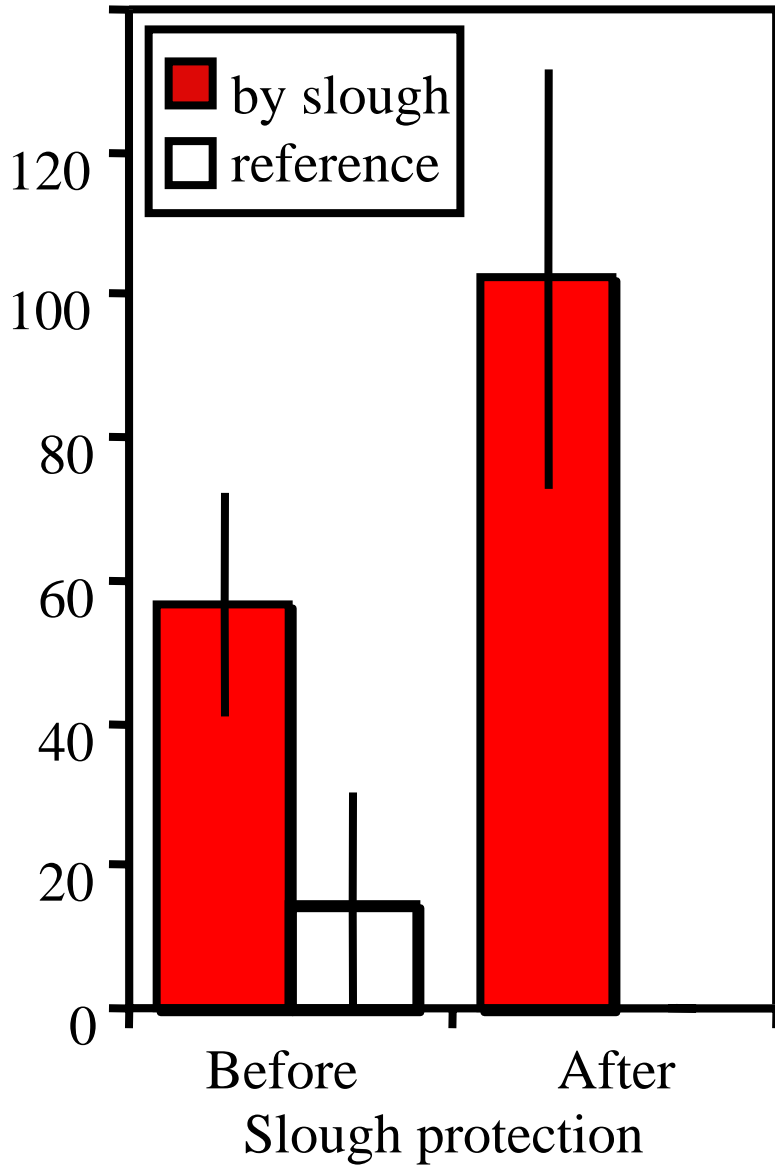
Increase in compliance



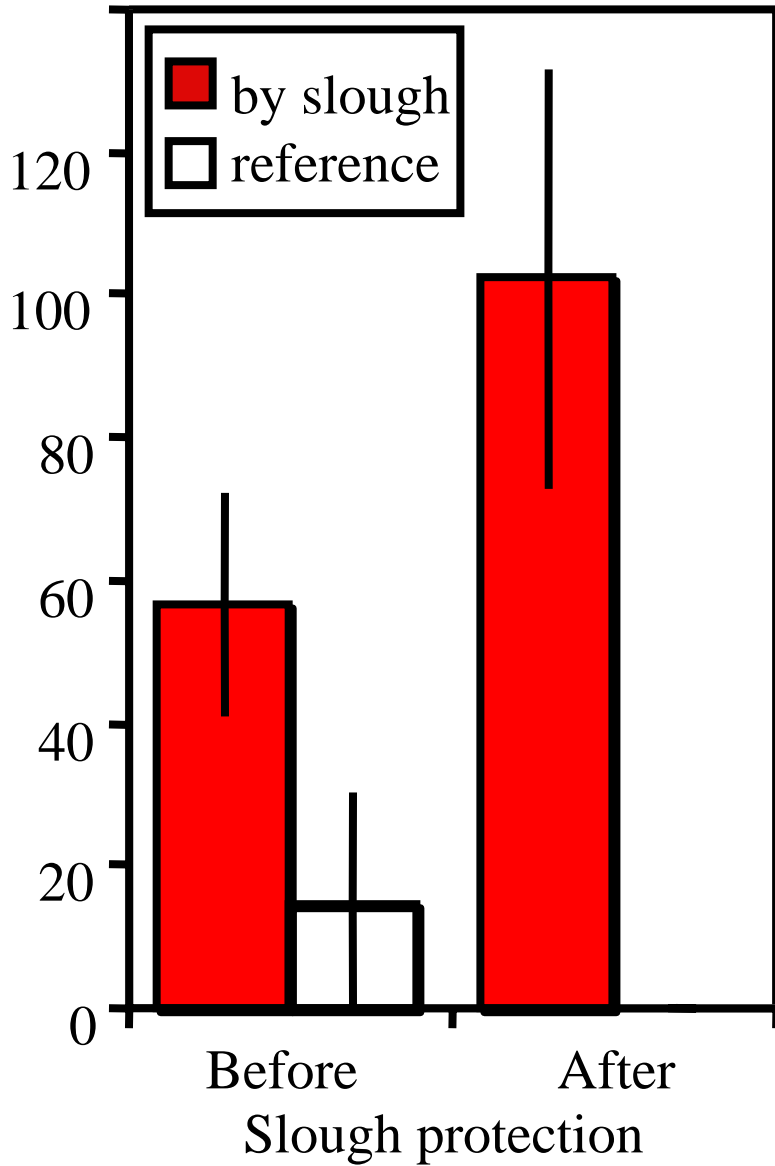




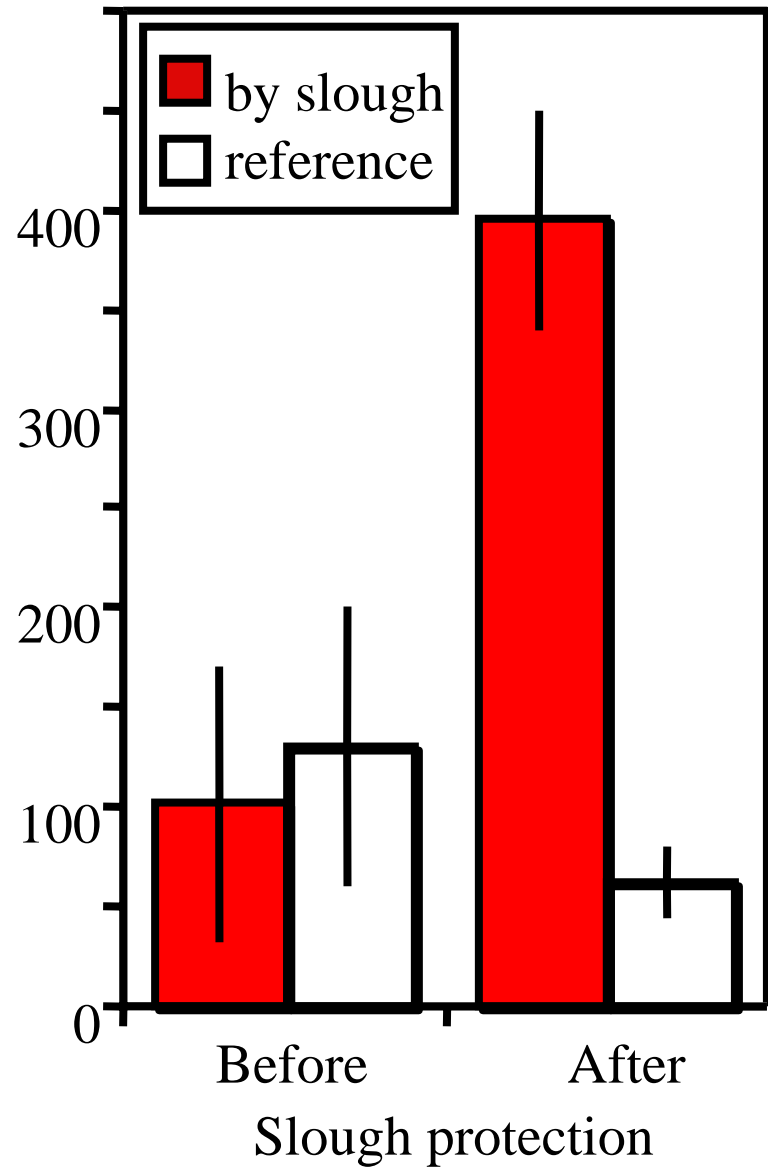
Plovers



Plovers



All birds



Recovery in breeding

Year	Pairs	Nests	Chicks Fledged
1970-2000	few	0-2	0
2001	1	1	1
2002	5	9	14
2003	12	24	40
2004	14	51	29
2005	30	64	30
2006	34	43	48

Research findings

- With high disturbance, no breeding
- Management
 - Increased awareness
 - Increased compliance
 - Decreased disturbance
 - Increased breeding population
 - Increased egg survivorship
- Plovers bred successfully after protection

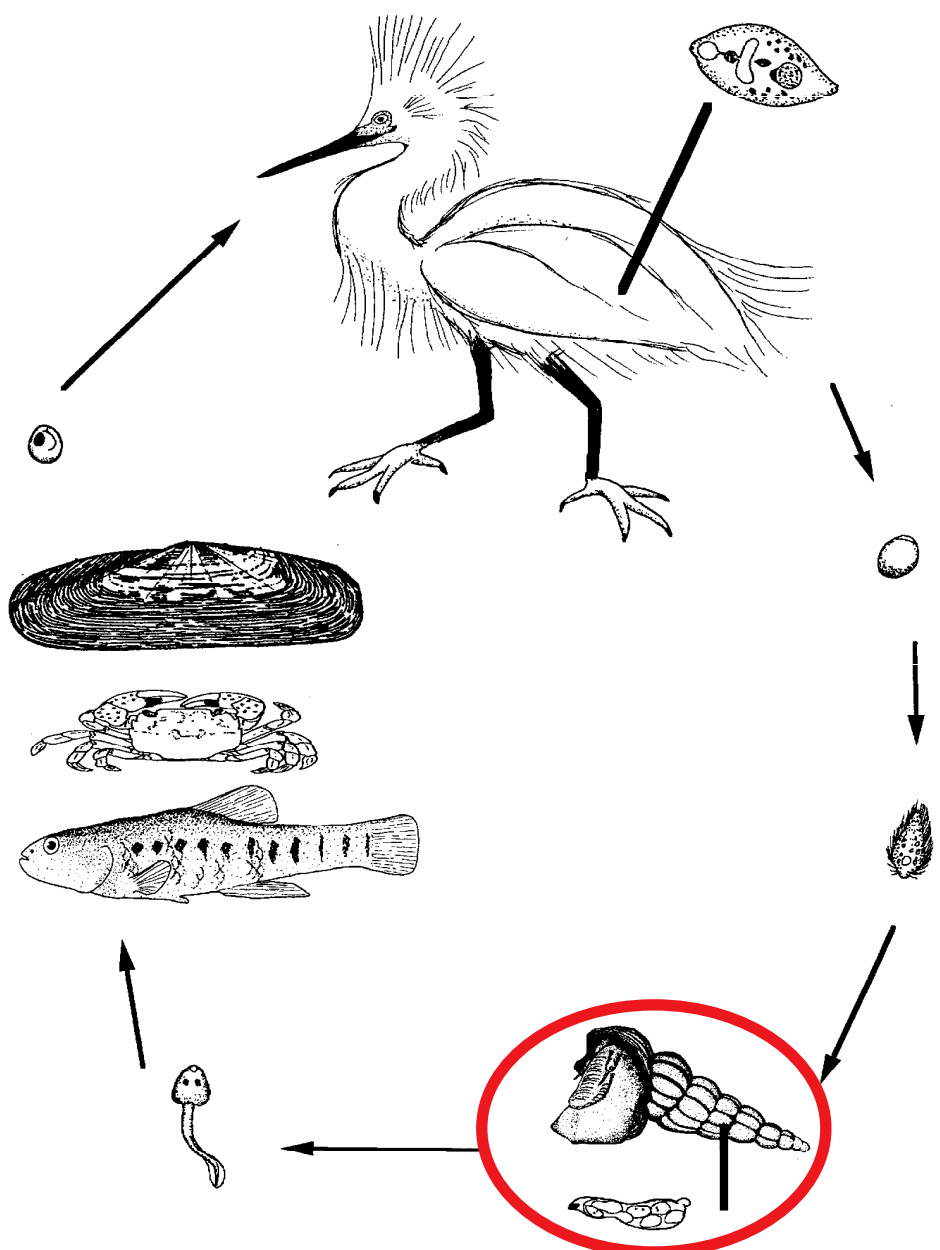
CONCLUSIONS

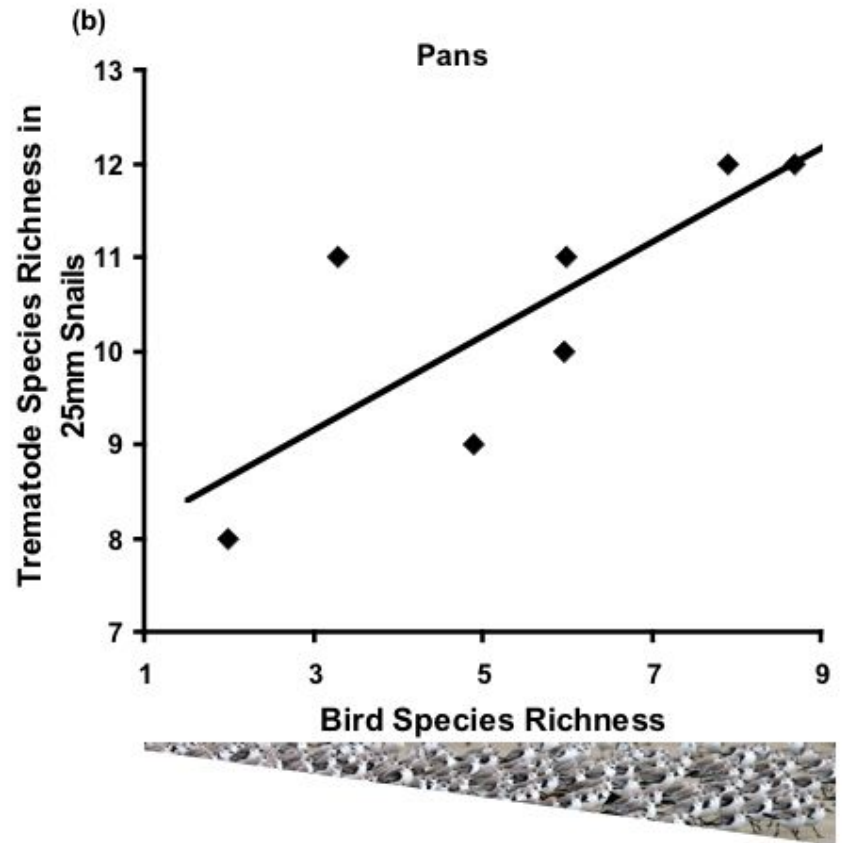
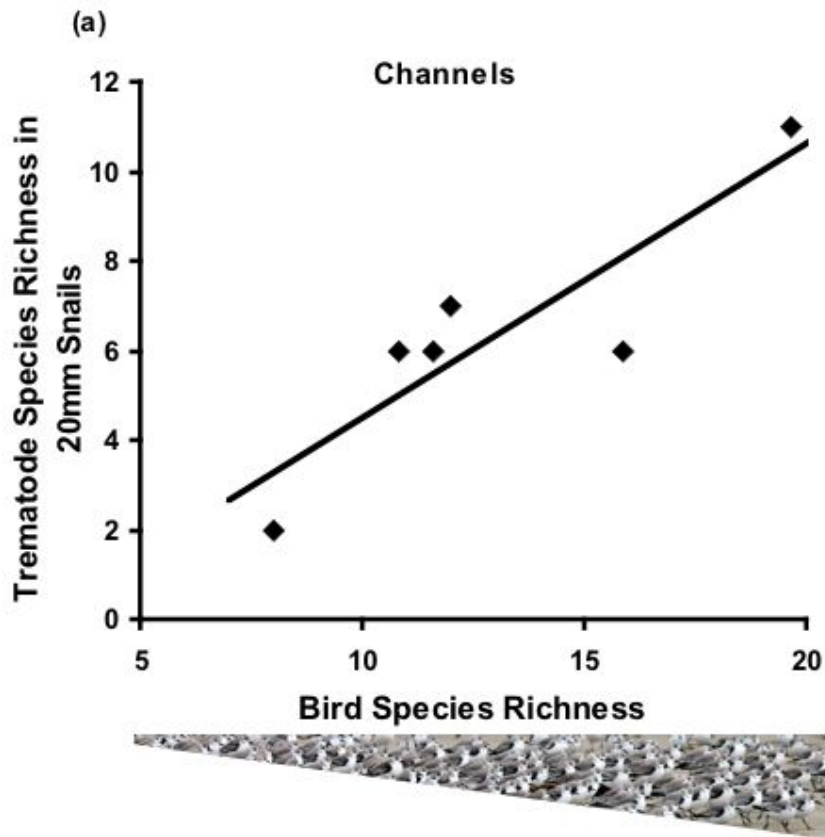


Time-lapse videography

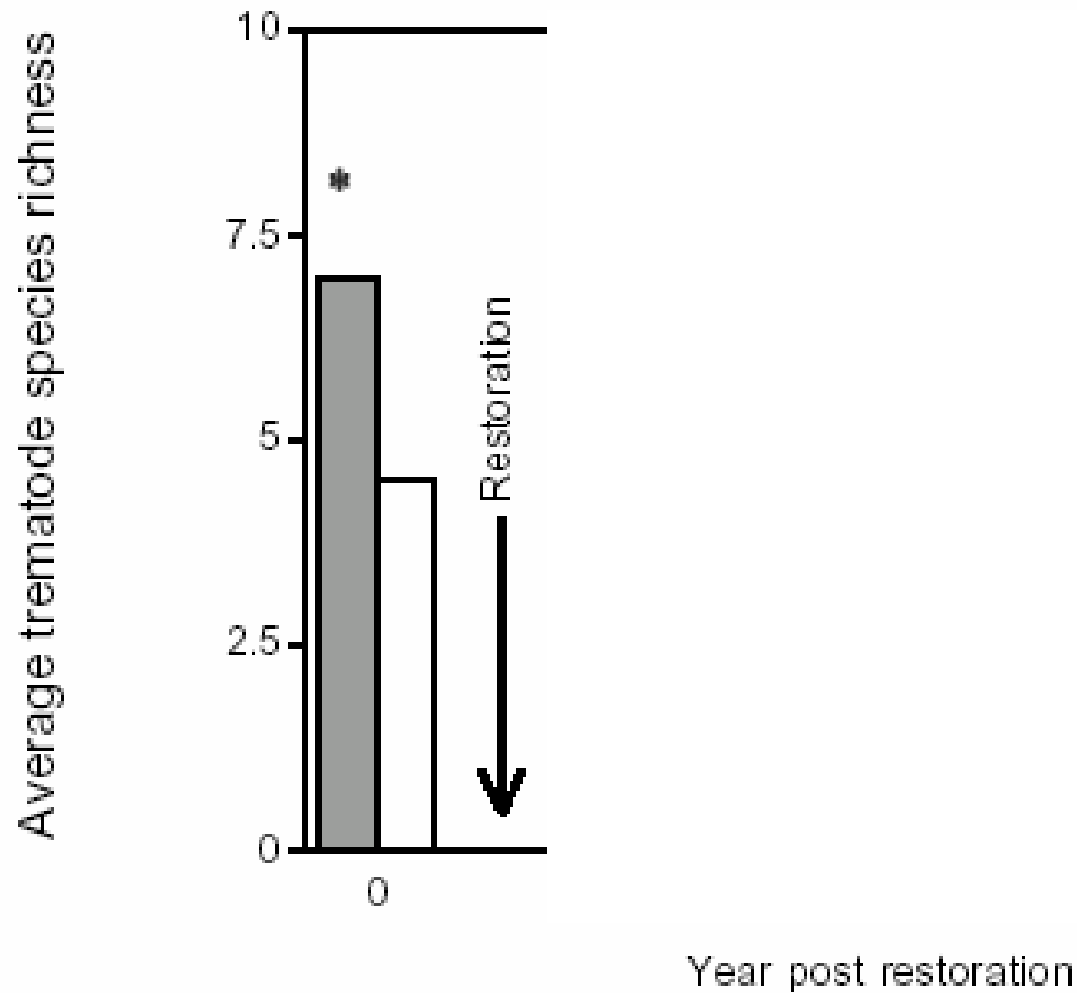
• 5 sec/min, 12 hrs/day, 14 days = 2000 clips

QuickTime™ and a
YUV420 codec decompressor
are needed to see this picture.





- Average species richness at control sites
- Average species richness at restored sites



Egg survivorship experiment

- 9 pairs of quail egg nests
- half inside fence, half outside
- no crow control



**10% daily chance of trampling
outside**



Crow predation inside and out



Increase in egg survivorship in fence

