

# PROTECTING LEAST TERNS DURING AN OIL SPILL

## **A Test of the Attraction of Artificial Fish Ponds**

*by*

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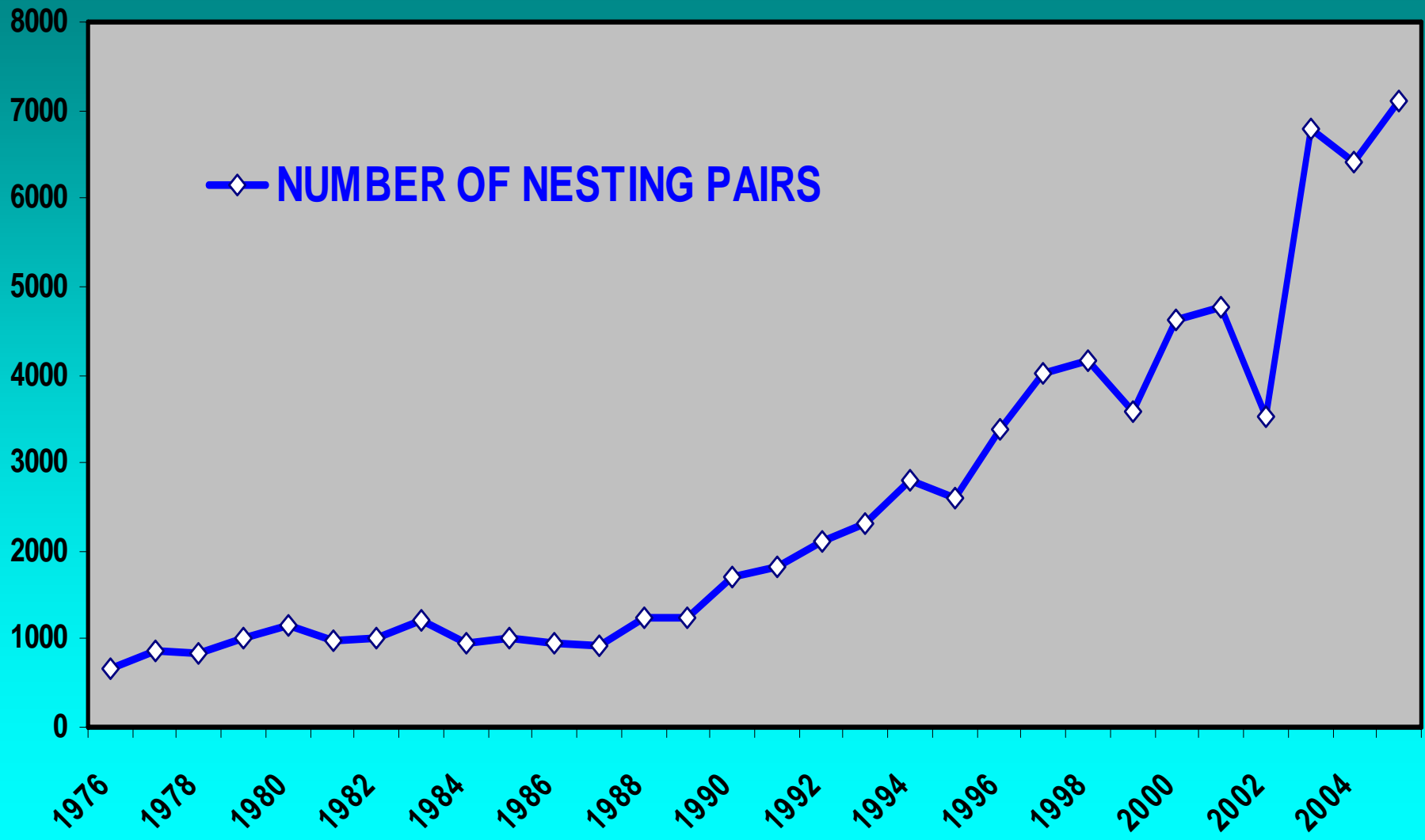
# California Least Tern Nesting



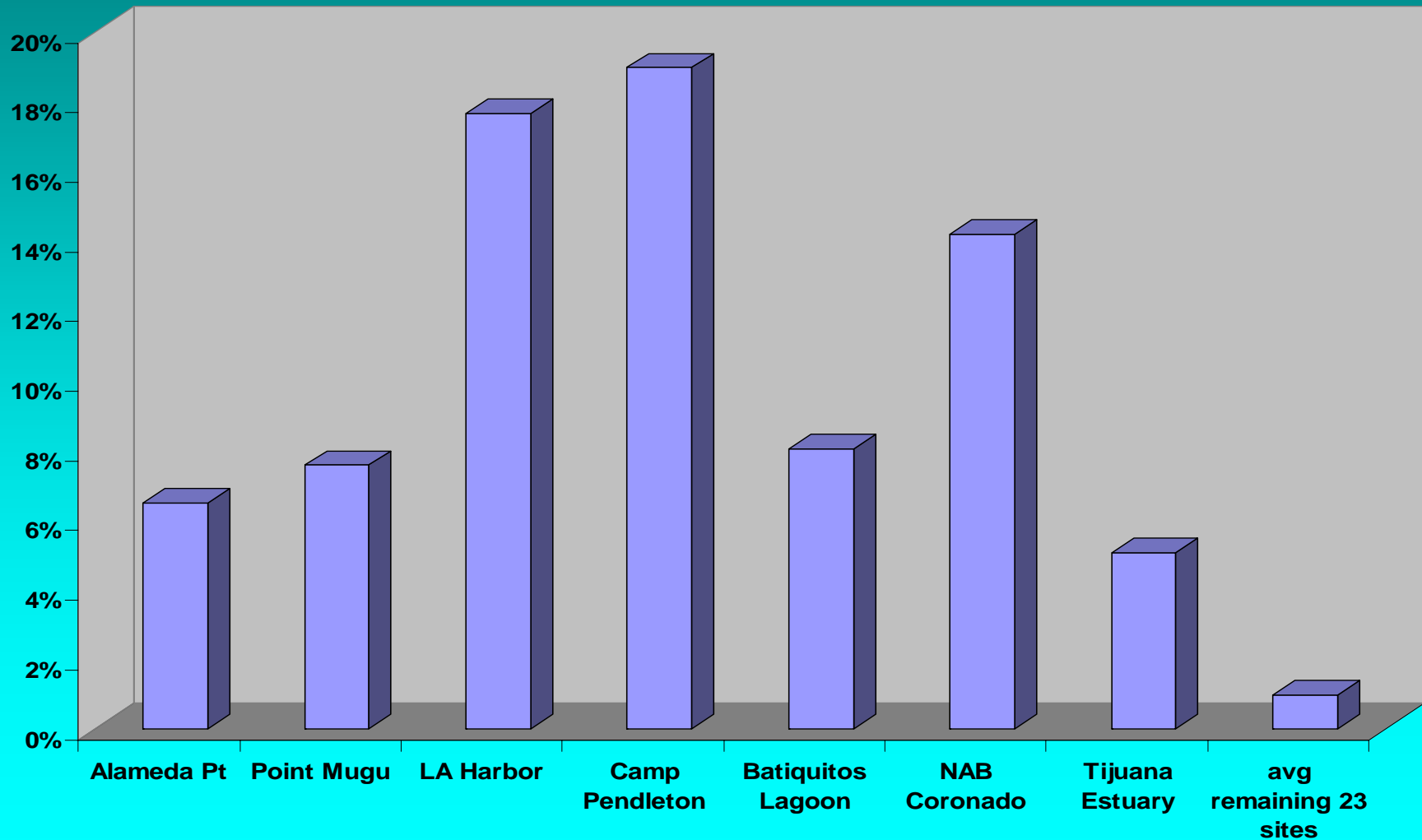
# California Least Tern Foraging



# California Least Tern Statewide Population



# Major Concentrations of California Least Tern Nesting



# Experimental Questions

- Does the creation of an artificial food source attract California Least Terns (CLT) to the extent that their foraging is reduced at known, preferred foraging areas (PFAs)?
- How much is CLT foraging reduced at PFAs?
- Can CLT be lured away from PFAs for three consecutive days?
- Will the experiment work with a simple backyard pool that can be easily purchased at a local department store?
- Will the experiment work using readily available fish (e.g. mosquito fish or anchovies from bait barges)?
- How many pools and how many fish are needed to feed a specified number of CLT?



# California Least Tern

## Foraging is Opportunistic

- In the 1970s, Orange County Vector Control placed a cattle trough filled with water and fish near a CLT nesting area.
- Several CLT discovered the food source immediately and began diving into the trough for fish. Many CLT fed at the trough for the next two days.
- This concept was modified and used again in 1979:

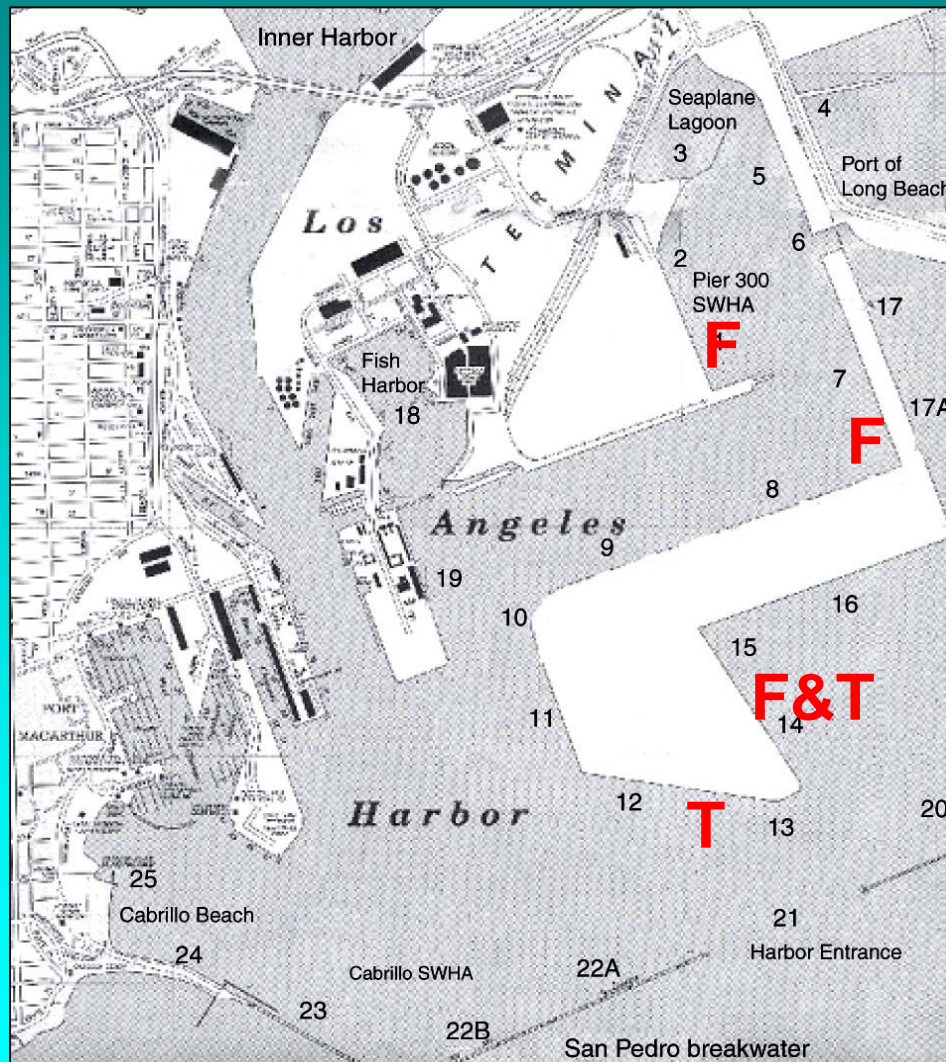


This aerial map of the Port of Los Angeles and San Pedro includes the following labels:

- Dominguez Channel
- Los Angeles River
- Cerritos Channel
- downtown Long Beach
- Desmond Bridge
- Long Beach Middle Harbor
- Long Beach Outer Harbor
- West Basin
- Slip 5
- Slip 1
- East Basin
- Terminal Island
- Long Beach Queen Mary
- Turning Basin
- Vincent Thomas Bridge
- Fish Harbor
- Pier 300
- Pier 400
- San Pedro
- Ports O'Call Village
- Main Channel
- East Channel
- Reservation Pt.
- San Pedro Bay
- West Channel
- Los Angeles Outer Harbor
- Cabrillo Marine Museum
- Cabrillo Fishing Pier
- San Pedro Breakwater
- Angels Gate
- tern colony
- Point A, B, C, D, E, F, G, H, J



# Known, Preferred Foraging Areas (comparison foraging stations)



**F = foraging dives**

**T = transit flights**

# Experiment Setup





# Mosquito Fish Delivery



(we used mosquito fish instead of anchovies due to assured availability)







# Large Pool with light background





# Floating Pool #1



# Floating Pool #2





**Finally, 3 days later, some interest!**



# Foraging at Large Pool





# Why the delay for foraging in pools?



**1) Algae growth**

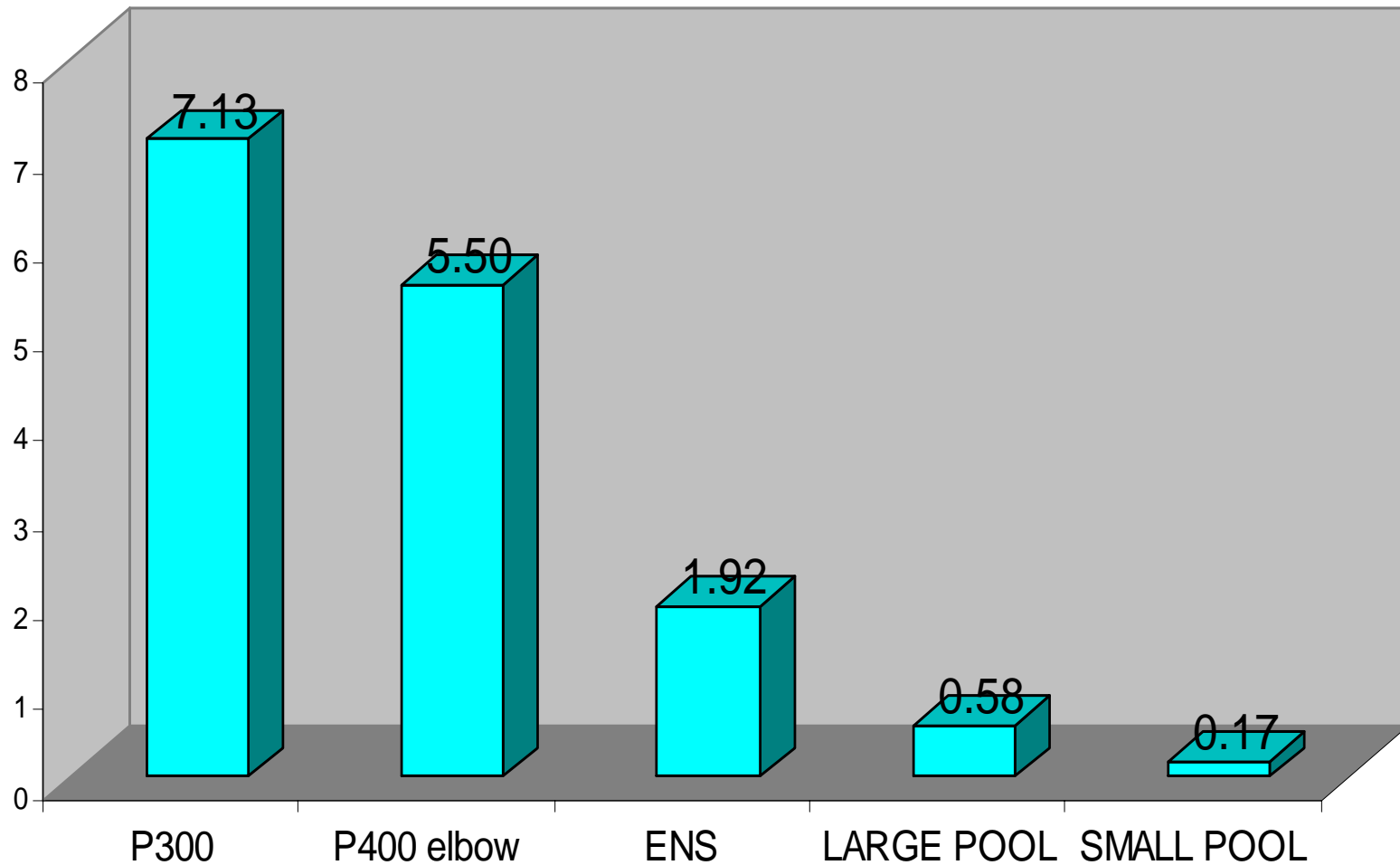


## **2) Chick Hatching:**

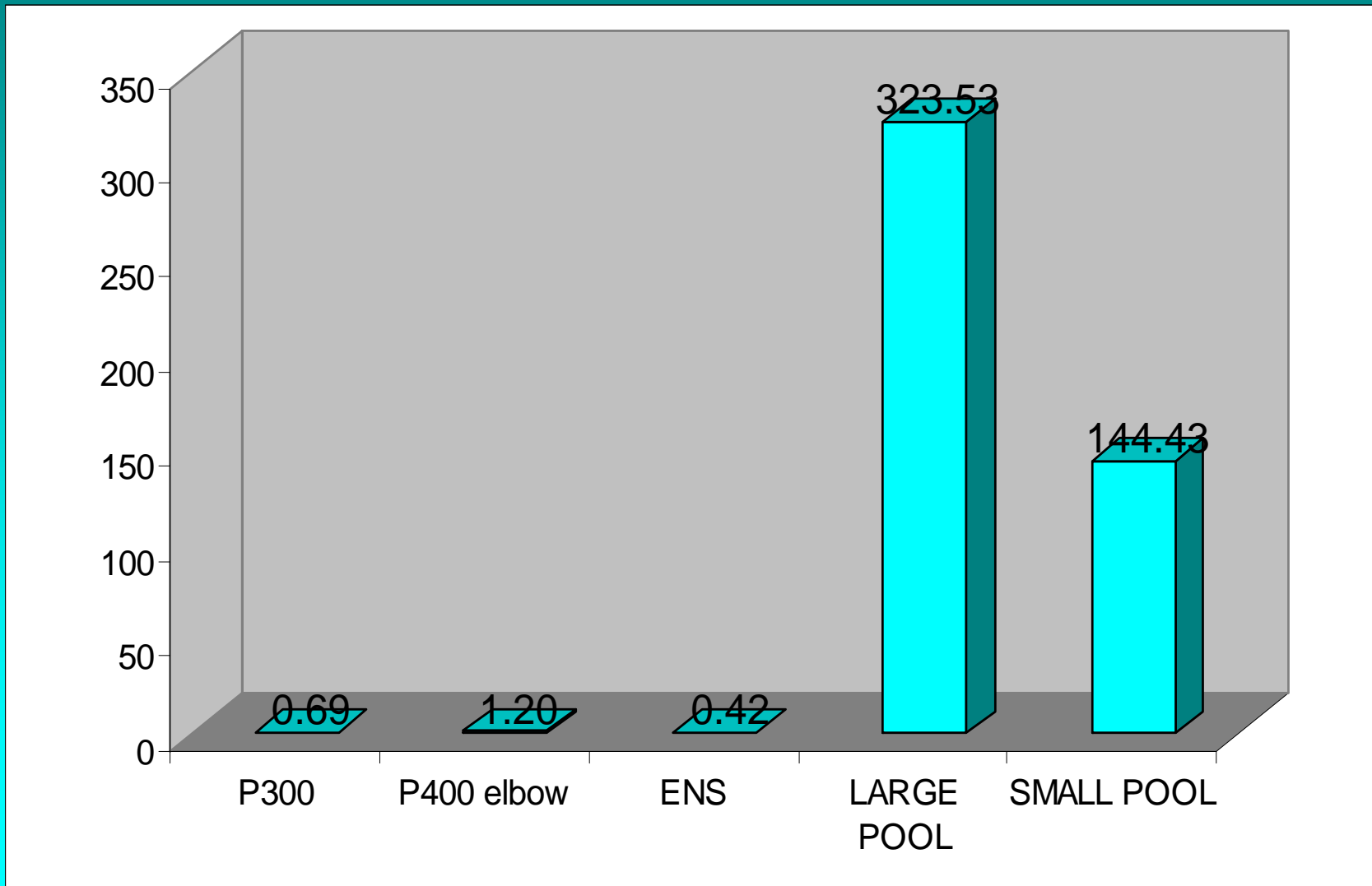
Foraging dives at pools began June 9; first chick June 9;  
30 chicks by June 11;  
238 more by June 15.



# Mean CLT Dives per Survey



# Mean CLT Dives per Survey per Acre



# Conclusions

- **Some CLT will use and successfully obtain fish from the pools.**
- **Some CLT may exhibit territorial behavior over the pool(s).**
- **The pools with clear water were not as attractive to CLT as pools with a heavy growth of green algae.**
- **Size matters. There were more CLT dives into the large (10-ft diameter) murky pool than the smaller (8-ft diameter) murky pool, and very few dives into the small clear-water pool.**
- **The intensity of foraging never exceeded more than 4 dives per 10-minute survey period. Thus, in the event of an oil spill, the pools would not be successful in diverting large numbers of least terns from oil spill areas. However, if the oil spill is in a PFA and it affects the availability of CLT prey, it's possible the pools would become more heavily used.**

# Answers to Questions

- Does the creation of an artificial food source attract California Least Terns (CLT) to the extent that their foraging is reduced at known, preferred foraging areas (PFAs)? **NO**
- How much is CLT foraging at reduced at PFAs? **NOT NOTICEABLY**
- Can CLT be lured away from PFAs for three consecutive days? **NO**
- Will the experiment work with a simple backyard pool that can be easily and quickly purchased at a local department store? **YES**
- Will the experiment work using readily available fish (e.g. mosquito fish) **YES** (or anchovies from bait barges)? **UNKNOWN**
- How many pools and how many fish are needed to feed a specified number of CLT? **UNKNOWN (20 x 1800=36000 fish)**

# Recommendations





# Acknowledgements

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