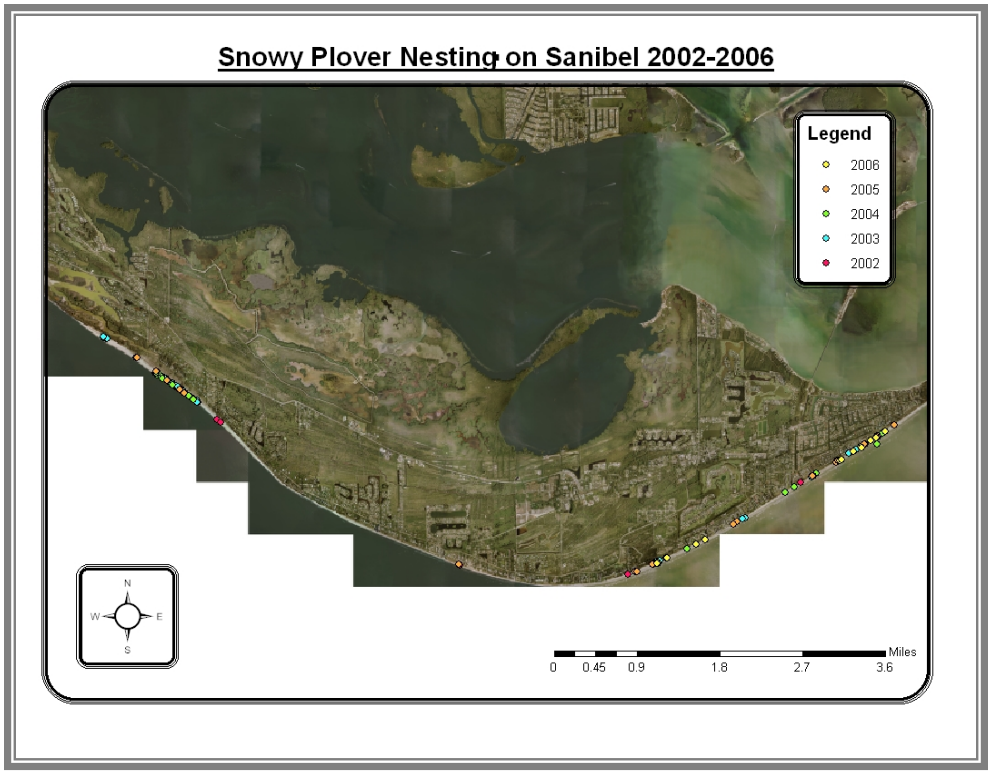
Snowy Plover Nesting on High Traffic Beaches

Sanibel-Captiva
Conservation Foundation

Sanibel Island

- **approx. ten miles of Gulf Beach**
- **heavily visited for its pristine/natural beaches**
- **City maintains strict ordinances aimed at protecting the beach community**



Conservation Efforts

- in 2002 we started actively searching for nests
- nests were staked and monitored to hatch
- broods were monitored to determine fledging
- began educating the public

Estimates of the minimum number of nesting pairs by year	
	min. # pairs
2002	13
2003	15
2004	11
2005	13
2006	6
2007	6

Number of chicks fledged per nesting attempt and per female by year. Overall the #fledged/female fell short of the estimated replacement ratio of .889

	# fledged/nest	#fledged/female
2003	0.1316	0.3333
2004	0.4516	1.2727
2005	0.1282	0.3846
2006	0.3125	0.8333
2007	0.5715	1.3333
Overall	0.2096	0.83144

Initial Observations

- **nesting was occurring along some of the most heavily trafficked sections of beach**

Number of nests on Sanibel showing increase in the east and decrease in the west		
	West	East
2002	16	8
2003	17	14
2004	12	15
2005	5	24
2006	0	15
2007	0	13

Initial Observations (cont.)

- **fledging success was significantly higher in high traffic areas**

Increased success in East End nesting areas as measured by daily survival rate of a nest (DSR), hatch success (HS), brood success (BS), success from laying to fledging (LFS), and chick survival rates (CSR).

	# nests found	est. # nest	DSR[a]	limits[b] +/-	SE[b]	**HS[c]**	BS[d]	LFS[e]	#chicks hatched	**CSR[d]**	**# fledged/ nest**
East End[f]	53	64	0.9683	0.0112	0.0056	**0.3432**	0.3208	0.1101	54	**0.3333**	**0.3438**
West End[f]	33	51	0.9659	0.0163	0.0082	**0.3156**	0.1212	0.0383	42	**0.1429**	**0.098**

[a] per Mayfield (1961, 1975)

[b] per Johnson (1979)

[c] per (Mayfield 1961) assuming 33.4days from incubation to hatching

[d] per apparent method

[e] product of HS x BS

[f] '03-'05 data only

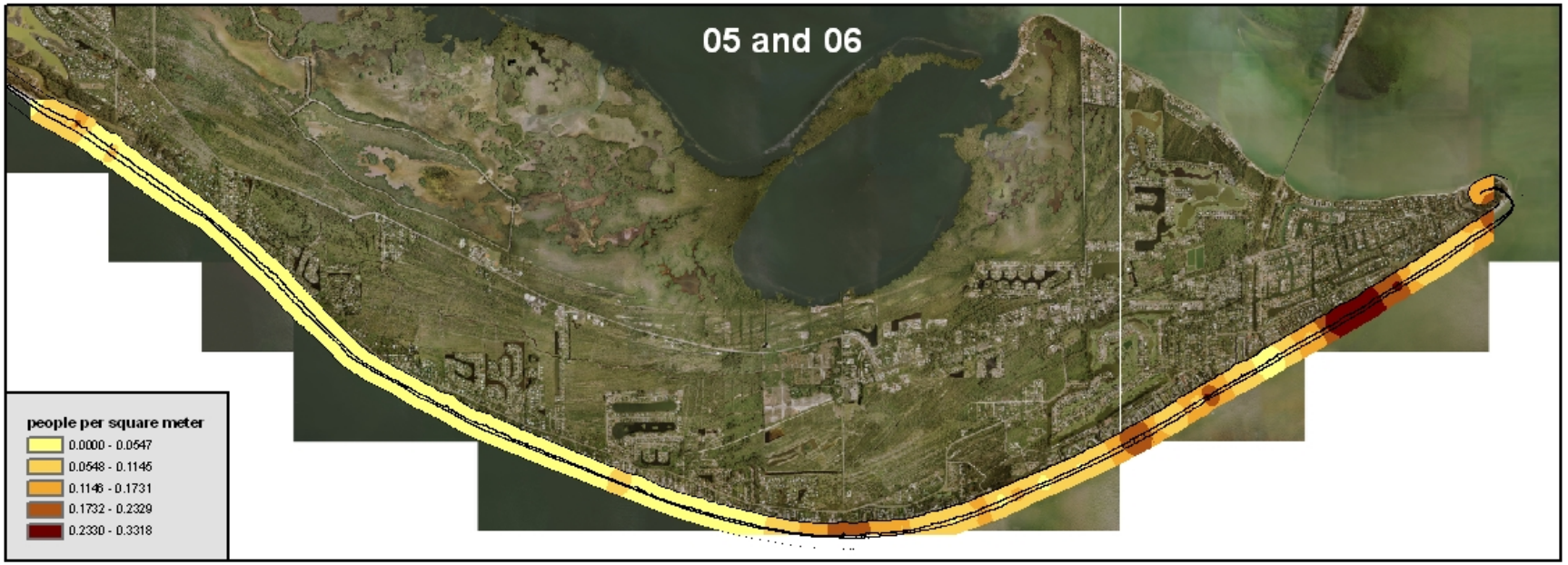
We set out to:

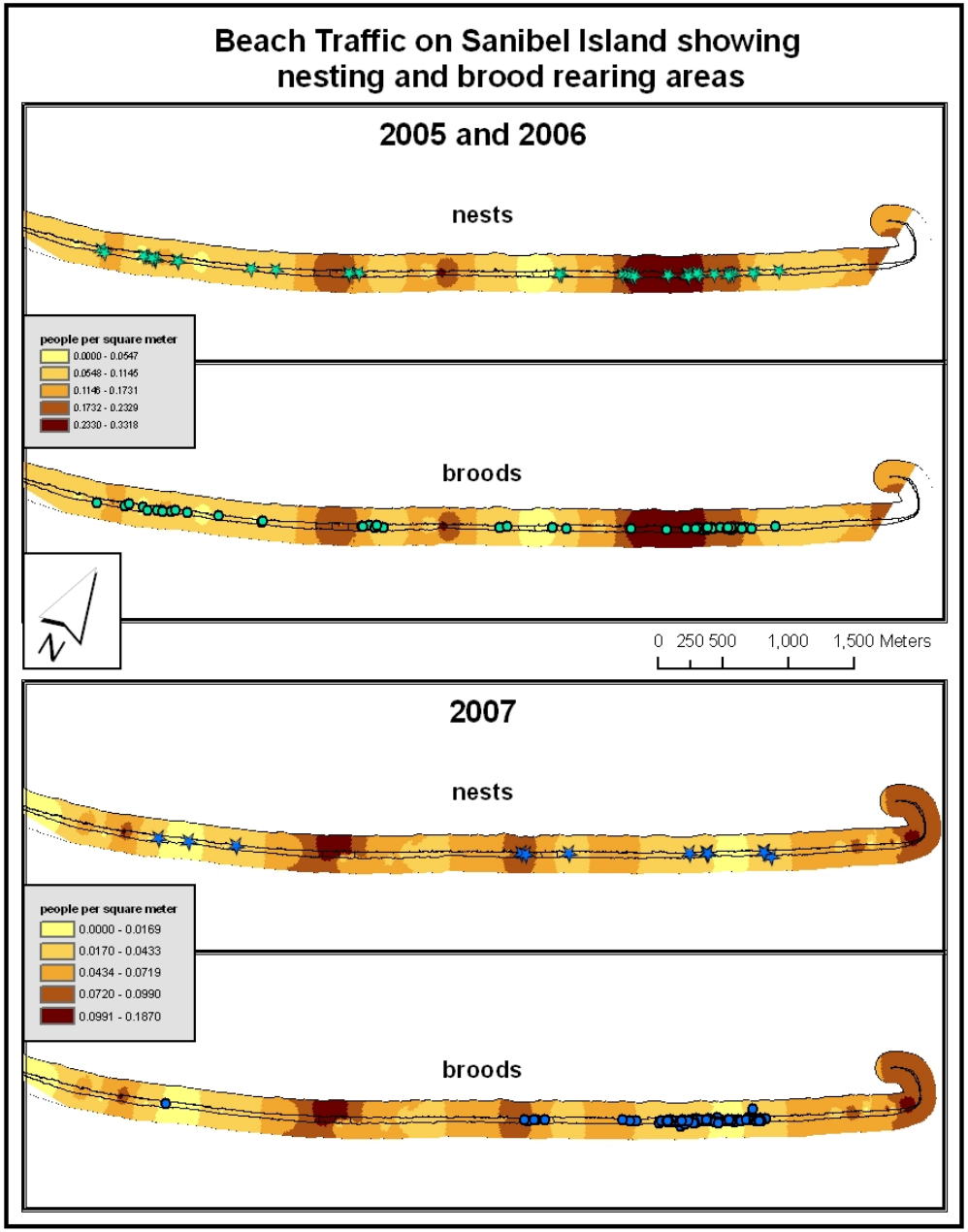
- determine nesting habitat
  - What qualities of nest habitat are being selected for?
- map beach traffic
  - What are the patterns of beach traffic on Sanibel?
  - How are SNPL responding to traffic?
- map invertebrate abundance
  - What are the patterns of prey abundance on Sanibel?
  - How are SNPL responding to these patterns?

Nesting Habitat

- SNPL are selecting nest sites with greater amounts of dead organic, and large shell particles
- they tend to place their nests within a meter or two of the vegetation line
- year over year site fidelity appears to be prominent
- many areas of what appear to be good nesting habitat are not being used

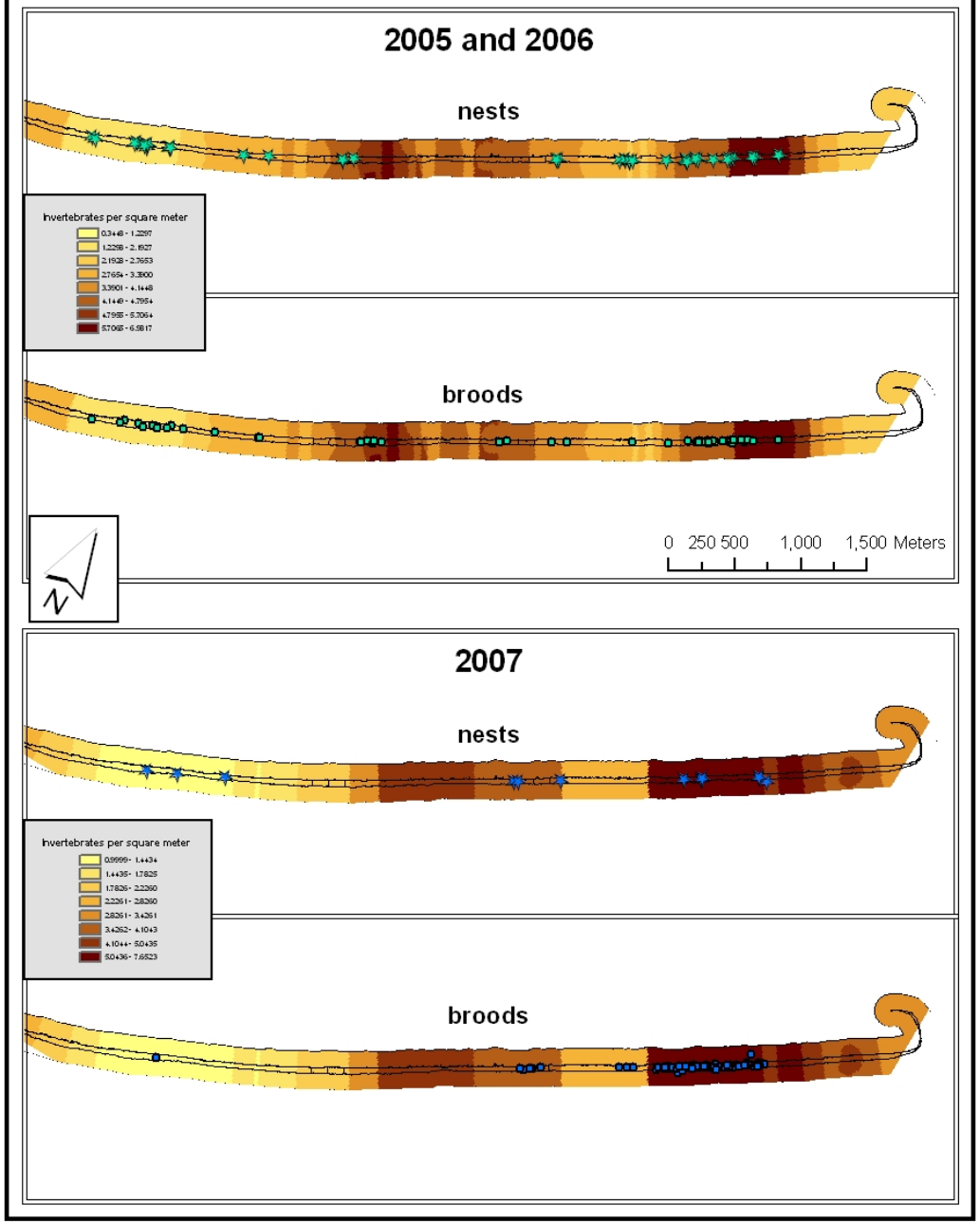
Beach Traffic on Sanibel Island




Beach Traffic on Sanibel Island showing
nesting and brood rearing areas
2005 and 2006
nests
people per square meter
0.0000 - 0.0547
0.0548 - 0.1145
0.1146 - 0.1731
0.1732 - 0.2329
0.2330 - 0.3318
broods
N
0 250 500 1,000 1,500 Meters
2007
nests
people per square meter
0.0000 - 0.0169
0.0170 - 0.0433
0.0434 - 0.0719
0.0720 - 0.0990
0.0991 - 0.1870
broods

Invertebrate density on Sanibel Island beaches

Invertebrate density, nest locations, and brood rearing areas on Sanibel Island beaches



Other observations

- invert densities are greatest on the low beach and decrease as you approach the dune
- likewise beach traffic is greatest by far on the low beach and decreases as you approach the dune
- foraging efforts of chicks are concentrated equally at mid and low levels
- foraging of adults is concentrated mostly low on the beach

Final Thoughts

- SNPL's on Sanibel offer hope that successful nesting is not incompatible with recreational beach use
- high traffic beaches can support positive population growth
- invert abundance appears to be an important influence on successful fledging
- protection of dune habitat, lack of raking, and staking of nests may be keys
- we hope to be able to expand this research to nearby islands to have a local basis for comparison with Sanibel