



Marine Birds and Mammals Evaluation for the MLPA North Central Coast

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Presented to the

MLPA Master Plan Science Advisory Team

23 January 2008

(revised 1/28/08)



Marine birds evaluation methods

- **Breeding Colonies**
- **Abundance and % of subregional populations:**
 - **Brandt's Cormorant**
 - **Pelagic Cormorant**
 - **Double-crested Cormorant**
 - **Common Murre**
 - **Pigeon Guillemot**
 - **All Species**
 - **Species diversity**



Birds evaluation methods (con't)

- **Foraging Areas**
- **Focus on species with limited foraging ranges**
- **Buffered colonies 3 miles alongshore x 1 mile offshore**
- **Weighted area of abundance based on colony size and foraging area of overlap within proposed MPAs.**



Evaluation methods (con't)

- **Seabird Roosts**
- **Broad-scale data available only for major roosts of Brown Pelican**
- **Identified numbers of major roosts included in MPA proposals.**



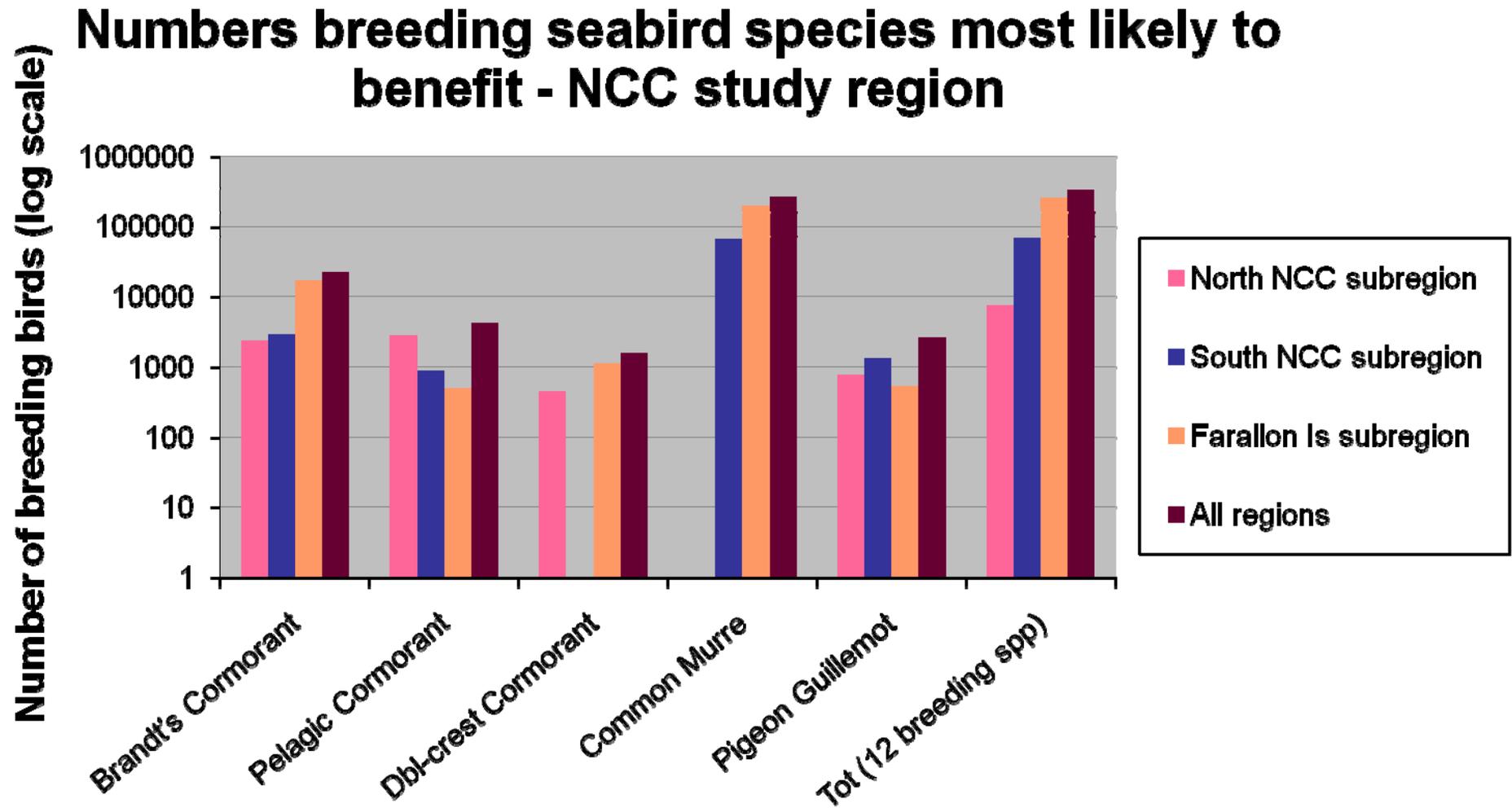
Numbers of breeding seabirds NCC

Numbers of breeding seabirds by bioregion

Species most likely to benefit	NCC Subregion			NCC Study Region
	North NCC subregion	South NCC subregion	Farallon Is subregion	All regions
Brandt's Cormorant	2344	2963	17116	22423
Pelagic Cormorant	2823	887	504	4214
Dbl-crest Cormorant	450	0	1122	1572
Common Murre	0	65609	199328	264937
Pigeon Guillemot	768	1316	541	2625
Total (12 species)	7588	71321	256645	335554



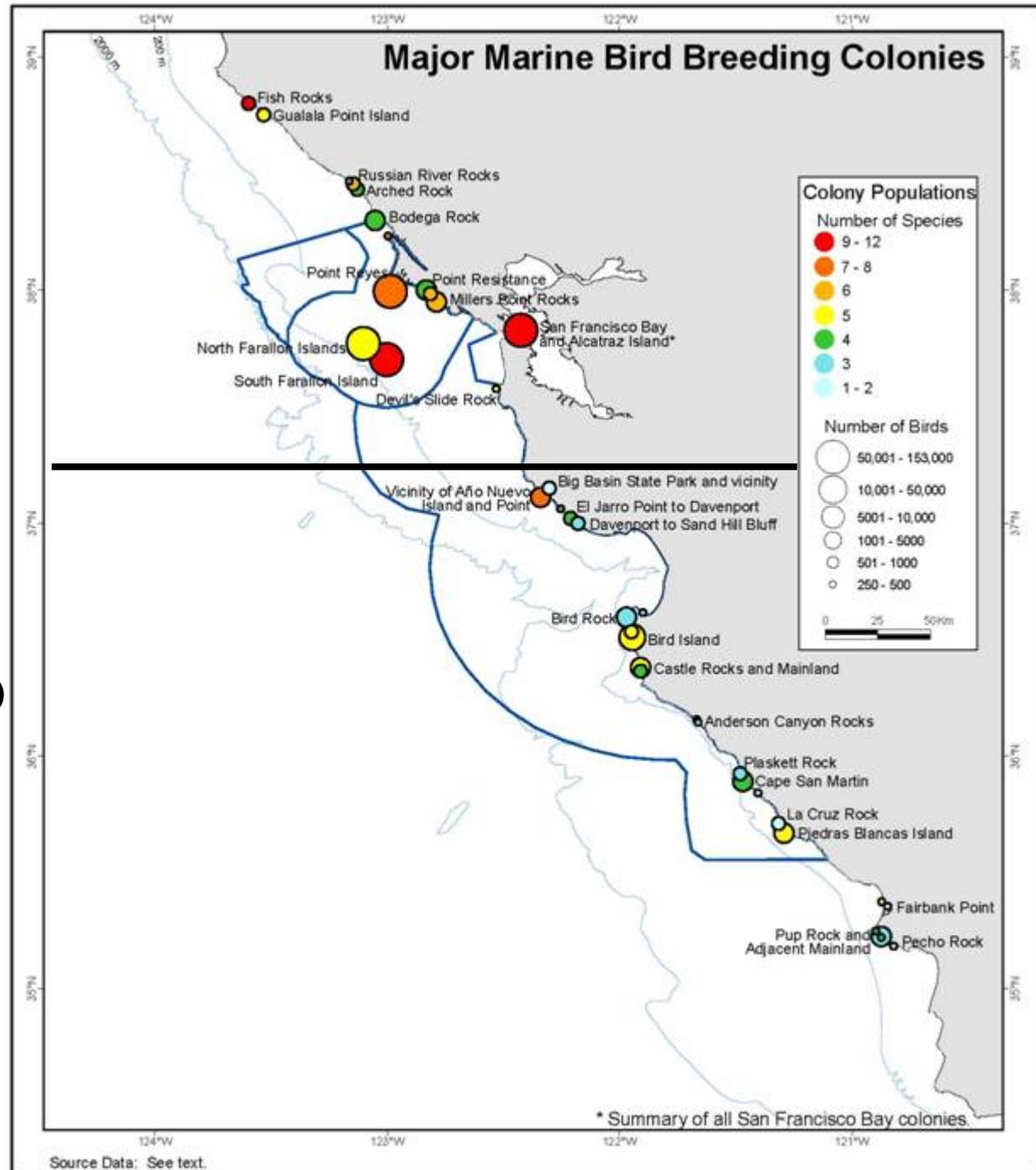
Numbers breeding seabirds NCC study region





Seabird Hot spots

- Farallon Islands
- Devil's Slide
- Point Reyes
- "Drakes Bay" area
- Bird Rock (Tomales Pt.)
- Bodega Rock
- Russian River area
- Gualala Point
- Fish Rocks





Seabirds breeding colonies

Comparison between proposals of numbers and percentages of seabirds breeding w/in MPAs in each bioregion, NCC Study Region.

North Subregion

	Proposal 1 (EC)		Proposal 2 (JD)		Proposal 3 (TC)		Proposal 4 (JC)		Proposal ExA	
	Number seabirds	Percent seabirds w/in subregion								
Brandt's Cormorant	0	0.0%	2	0.1%	438	18.7%	2	0.1%	2	0.1%
Pelagic Cormorant	606	21.5%	528	18.7%	753	26.7%	995	35.2%	515	18.2%
Dbl-crest Cormorant	0	0.0%	238	52.9%	386	85.8%	238	52.9%	238	52.9%
Common Murre	0	0	0	0	0	0	0	0	0	0
Pigeon Guillemot	138	18.0%	114	14.8%	75	13.3%	105	13.7%	113	14.7%
Total birds	813	10.7%	980	12.9%	1872	24.7%	1326	17.5%	976	12.9%
Number species	4		6		7		6		6	



Seabirds breeding colonies (con't)

Comparison between proposals of numbers and percentages of seabirds breeding w/in MPAs in each bioregion, NCC Study Region.

South Subregion

	Proposal 1 (EC)		Proposal 2 (JD)		Proposal 3 (TC)		Proposal 4 (JC)		Proposal ExA	
	Number seabirds	Percent seabirds w/in subregion								
Brandt's Cormorant	2180	73.6%	1160	39.2%	1488	50.2%	2180	73.6%	1160	39.1%
Pelagic Cormorant	389	43.9%	266	30.0%	282	31.8%	389	43.9%	266	30.0%
Dbl-crest Cormorant	0	-	0	-	0	-	0	-	0	-
Common Murre	57008	86.9%	40810	62.2%	56628	86.3%	57008	86.9%	40810	62.2%
Pigeon Guillemot	926	70.4%	616	46.8%	640	48.6%	926	70.4%	616	46.8%
Total birds	60792	85.2%	43061	60.4%	59303	83.2%	60792	85.2%	43061	60.4%
Number species	9									



Seabirds breeding colonies (con't)

Comparison between proposals of numbers and percentages of seabirds breeding w/in MPAs in each bioregion, NCC Study Region.

Farallon Islands Subregion

	Proposal 1 (EC)		Proposal 2 (JD)		Proposal 3 (TC)		Proposal 4 (JC)		Proposal ExA	
	Number seabirds	Percent seabirds w/in subregion								
Brandt's Cormorant	17116	100%	17014	72%	17116	100%	17116	100%	17014	72%
Pelagic Cormorant	504	100%	442	88%	504	100%	504	100%	442	88%
Dbl-crest Cormorant	1122	100%	1122	100%	1122	100%	1122	100%	1122	100%
Common Murre	199328	100%	199328	100%	199328	100%	199328	100%	199328	100%
Pigeon Guillemot	541	100%	499	92%	541	100%	541	100%	499	92%
Total birds	256645	100%	184442	72%	256645	100%	256645	100%	184442	72%
Number species	12	100%	12	100%	12	100%	12	100%	12	100%



Seabird foraging areas

Weighted contributions to seabird foraging areas near colonies.

North Subregion

	Proposal 1 (EC)	Proposal 2 (JD)	Proposal 3 (TC)	Proposal 4 (JC)	Proposal ExA
Brandt's Cormorant	0.94	1.24	1.99	1.28	1.53
Pelagic Cormorant	1.58	1.14	2.13	1.82	1.12
Dbl-crest Cormorant	0.61	1.08	5.3	1.15	1.15
Pigeon Guillemot	1.12	0.96	1.25	1.12	1.08



Seabird foraging areas (con't)

Weighted contributions to seabird foraging areas near colonies.

South Subregion

	Proposal 1 (EC)	Proposal 2 (JD)	Proposal 3 (TC)	Proposal 4 (JC)	Proposal ExA
Brandt's Cormorant	4.41	3.47	4.81	4.30	2.68
Pelagic Cormorant	2.83	2.63	3.31	3.05	2.03
Dbl-crest Cormorant	+	+	+	+	+
Pigeon Guillemot	4.20	4.04	4.82	4.15	3.11



Seabird foraging areas (con't)

Weighted contributions to seabird foraging areas near colonies.

Farallon Islands Subregion

	Proposal 1 (EC)	Proposal 2 (JD)	Proposal 3 (TC)	Proposal 4 (JC)	Proposal ExA
Brandt's Cormorant	10.19	6.92	28.12	12.43	9.44
Pelagic Cormorant	8.99	6.11	28.14	12.10	8.32
Dbl-crest Cormorant	-	-	-	-	-
Pigeon Guillemot	9.46	6.43	28.13	12.23	8.75



Seabird roost areas

Numbers of major Brown Pelican roosts included in draft MPA proposals.

	Proposal 1 (EC)	Proposal 2 (JD)	Proposal 3 (TC)	Proposal 4 (JC)	Proposal ExA
North subregion	0	1	3	1	1
South subregion	5	1	3	4	2
Farallon Islands subregion	1	0	1	1	1



Summary for marine birds

- **Breeding colonies**
 - North subregion: Varied by species
 - South subregion: Proposals 1 (ED) and 4 (JC) highest
 - Farallon Is subregion: Proposals 1 (ED), 3 (TC), 4 (JC) highest
- **Seabird foraging areas**
 - Farallon Is subregion highest of all subregions
- **Seabird roosts**
 - North subregion : Proposal 3 (TC) highest
 - South subregion: Proposal 1 (EC) highest
 - Farallon Is subregion: Proposals 1(EC), 3 (TC), 4 (JC), Ext A highest



Marine mammals in NCC region

Results

- Species diversity
- Size of colonies
- Size of haul out sites
- Foraging areas of harbor seals – analyses pending

Sources of information

- NOAA biogeographical assessment of Marine Sanctuaries
- NOAA Fisheries – Mark Lowry
- FWS Farallon data
- Bonnell et al. 1982 aerial survey data of state for MMS



Number of breeding mammals by subregion

Numbers of breeding pinnipeds of 4 species within each of the three subregions of the NCC Study Region.

Bioregion	No. Species	Total	Hot spots	Steller sea lion	Northern fur seal	Northern elephant seal	Harbor seal
North	2	3300	7	72	0	0	3228
South	2	4089	6	0	0	1000	3089
Farallons	4	534	2	244	100	100	90
Total	4	7923	15	316	100	1100	6407



Number of mammals at haul out sites

Number of pinnipeds occurring at haul out sites within each of the three subregions of the NCC Study Region.

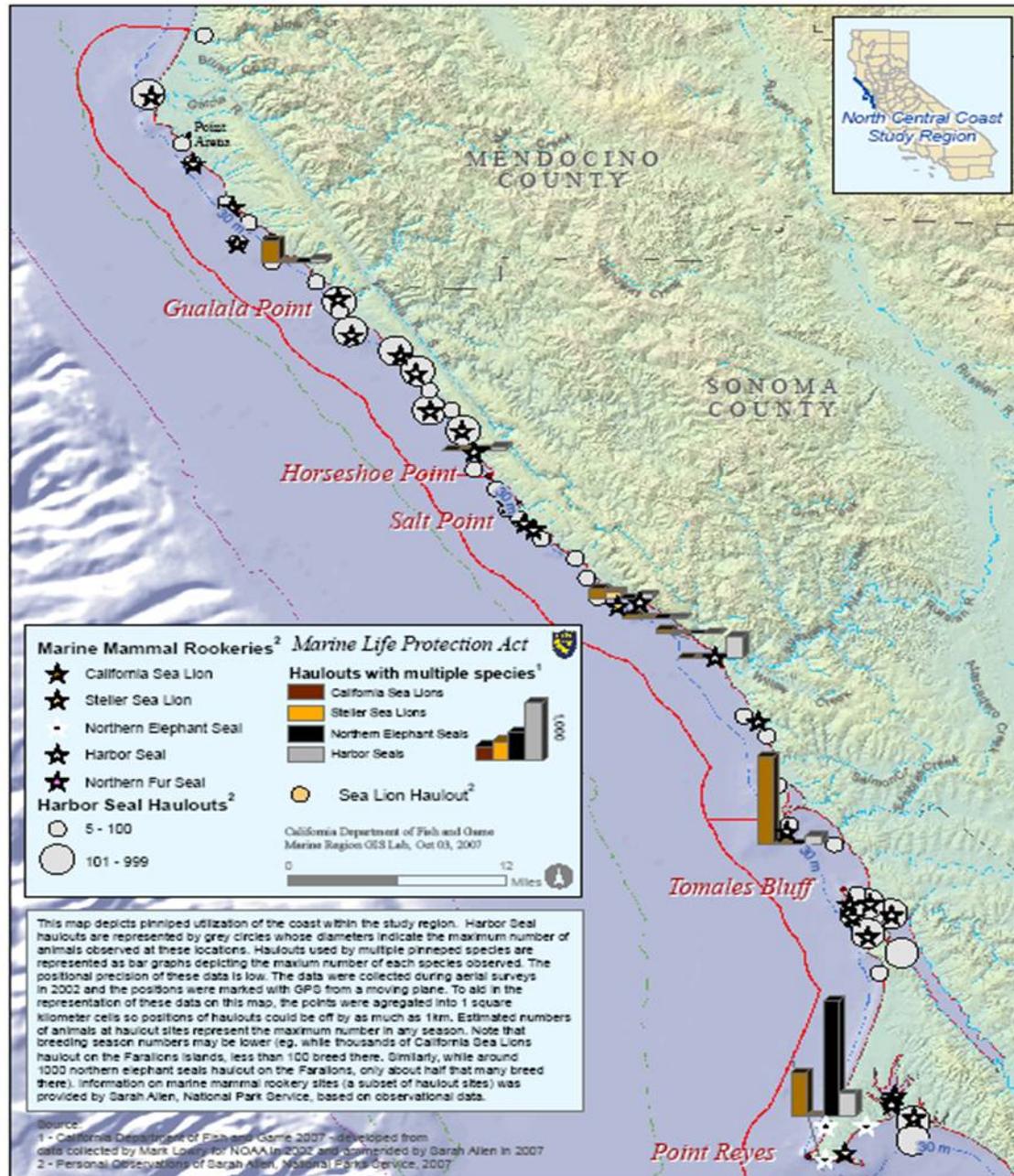
Sub region	No. Species	Total	Steller Sea lion	California Sea lion	Northern fur seal	Northern elephant seal	Harbor seal
North	3	7157	125	2191	0	0	4841
South	4	7440	36	1075	0	2000	4329
Farallon Islands	5	3490	200	2000	100	1000	90
Total	5	18087	361	5266	100	3000	9260



Marine mammal hot spots in NCC study region

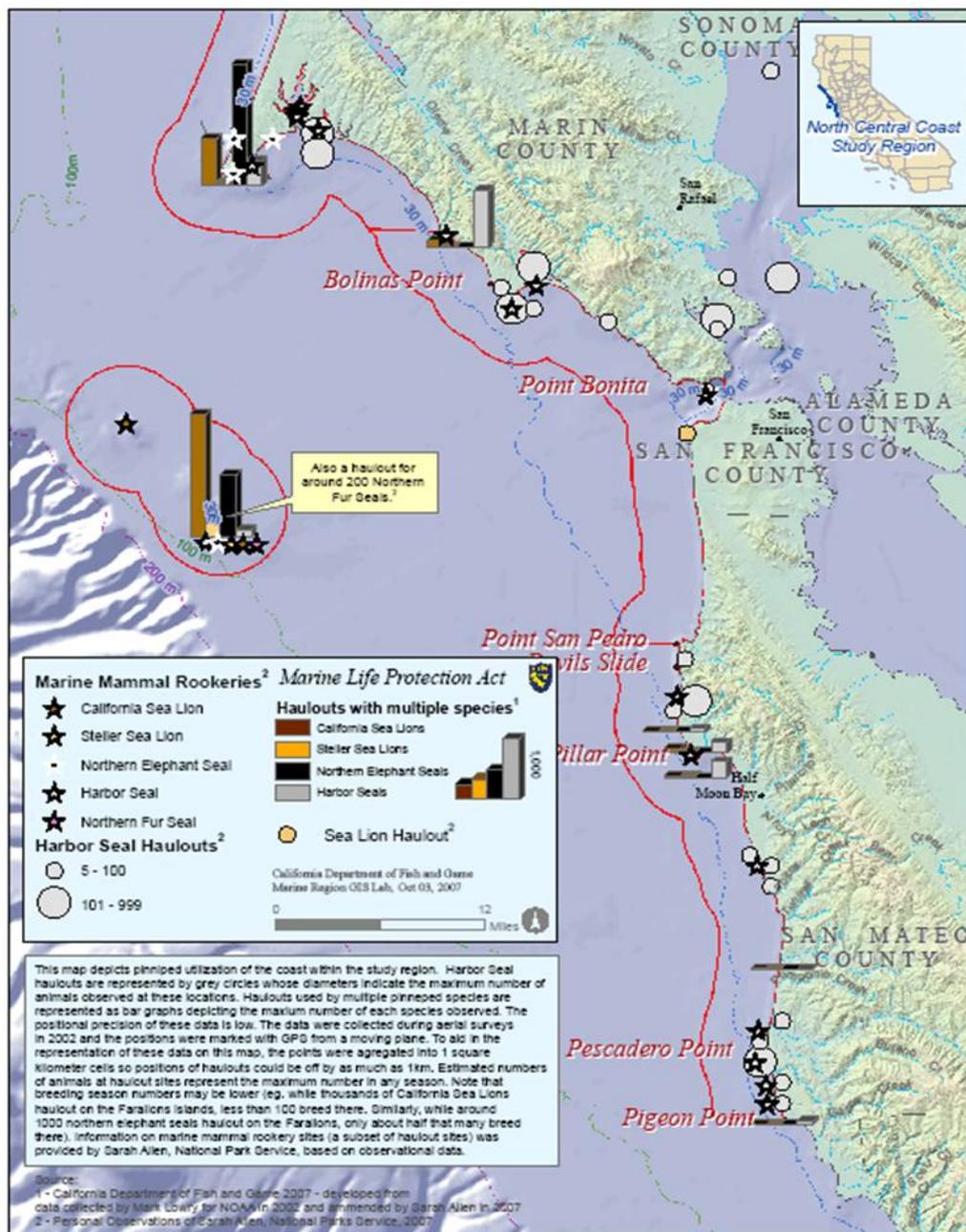
Hot spots are areas of high abundance and/or high diversity

Hot Spot	SubRegion
North Farallon	Farallon Islands
South Farallon	Farallon Islands
Cowell Ranch	South
Fitzgerald Marine Reserve	South
Bolinas Lagoon	South
Double Point	South
Drakes Bay	South
Point Reyes Headland	South
Tomales Point/Bird Rock	North
Bodega Rock	North
Tomales Bay-Clam/Seal Islands	North
Russian River	North
Russian Gulch	North
Fort Ross Reef	North
Fort Ross Rocks	North
Black Point Area	North
Fish Rocks	North



Map 5d Marine Mammal Haulouts and Rookeries

Northern

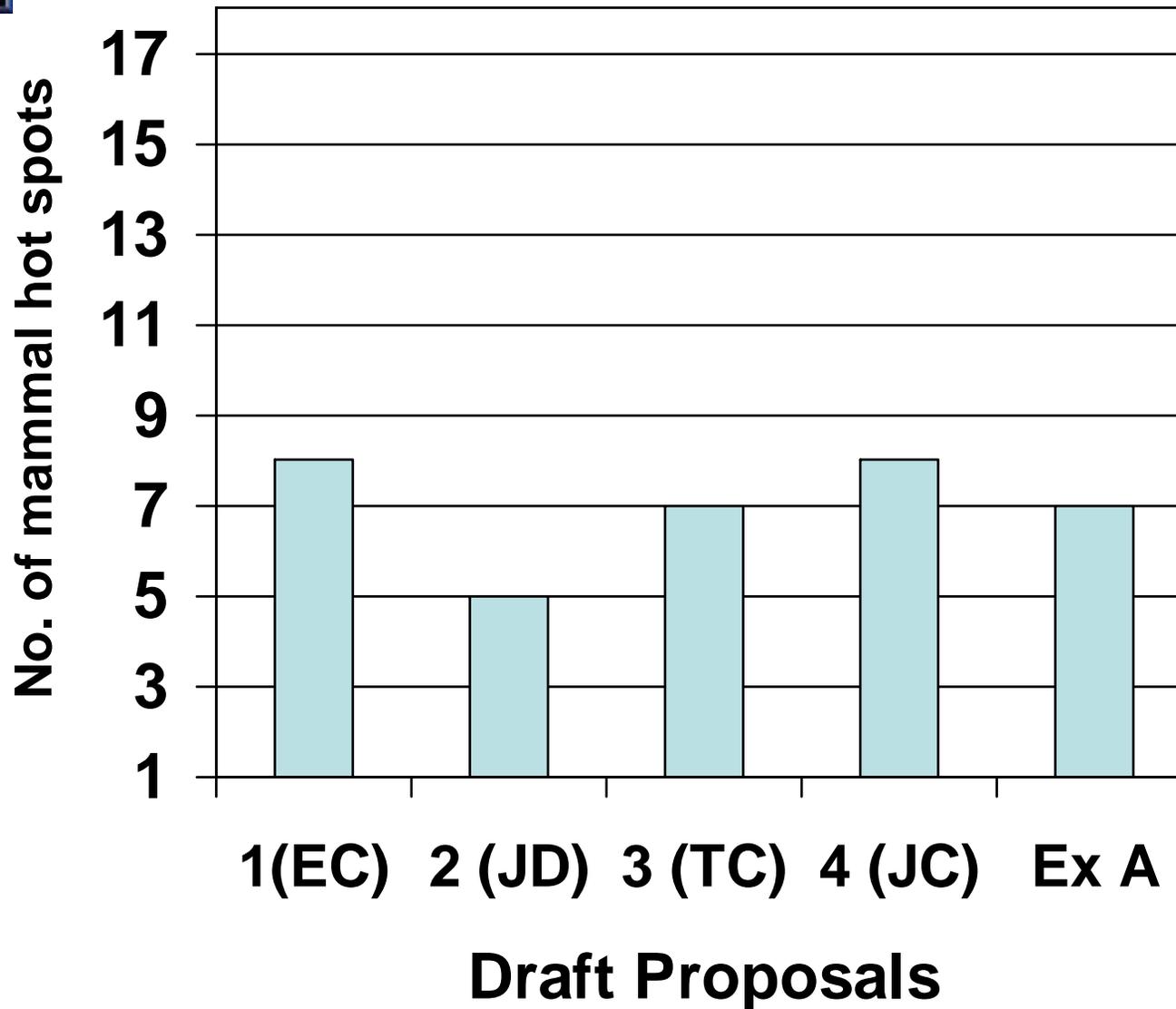


Map 5e Marine Mammal Haulouts and Rookeries

Southern

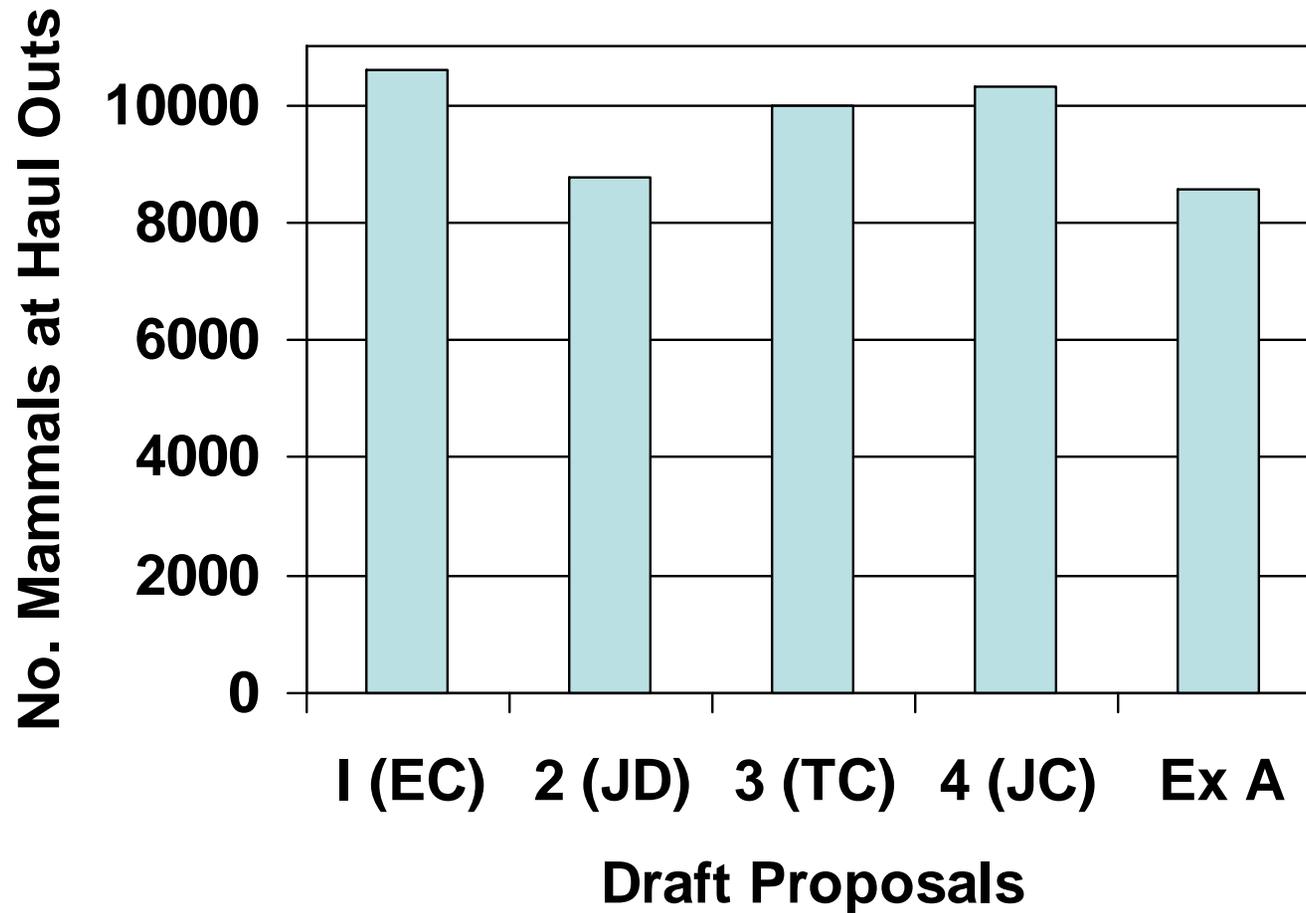


Marine mammal hotspots in NCC





Number of mammals in haul outs





Number of breeding mammals

