Steller Sea Lion Mitigation Committee Proposal Ranking Tool

SSLMC Proposal Ranking Tool
Outline of Presentation

- Brief (I promise) review of PRT and last round of changes
  - Rescoring of a few elements
  - Structural change and its effect on scores
- Model output
  - What do the numbers mean?
  - 5 handouts in total (by the last slide)
    - Model variable definition table- updated with scores!
    - Model Output ranking list
    - Model Output nutrition ranking list
    - Model weights spreadsheets
    - This presentation handout

Relative significance of proposed changes in fishery regulations that pertain to SSL and their prey

Effects of fishing on fish

How does fishing alter the prey field?

Season
- Summer
- Winter
- Summer-Winte
- Winter-Summe

% TAC
- 1-5%
- 6-10%
- >10%
- No change

Duration
- Shorter
- Longer
- Same duration

Effects of fishing on SSL

How sensitive are SSL to fishing?

Site-type
- Summer Rookery
- Summer Haulout
- Not CH

% sites
- 1-10%
- 11-25%
- 26-50%
- 51-75%
- 76-100%

How often do target species occur in SSL diet?

Season
- Summer
- Winter

b-region
- EGOA
- CGOA
- WGOA
- EAI/BS
- CAI
- WAI
- Pribs

Target
- Pacific cod
- Pollock
- Atka mackerel
- Other

SSLMC voted on the relative importance of these elements in regards to their impact to SSL based on expert judgment.

If new information becomes available, different judgments could be incorporated into the model.

May 2007
SSLMC PRT

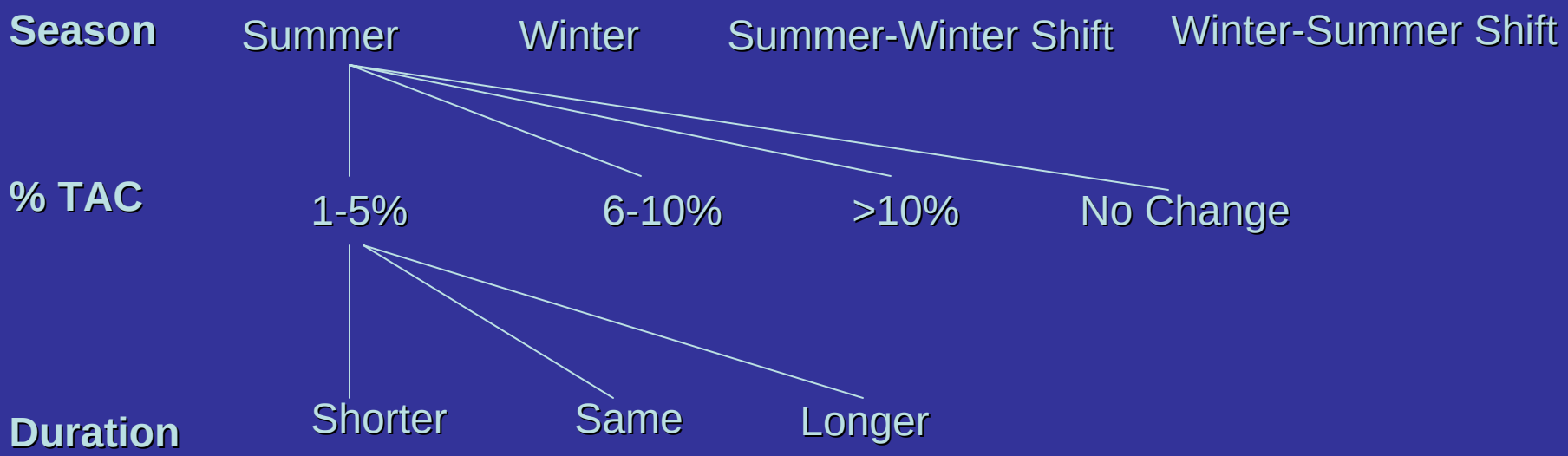
How does fishing alter the Prey Field?

Variables include:

- ***Season***
- ***Target removals (% TAC)***
- ***Duration of Fishery***

First Dimension - Effects of fishing on fish

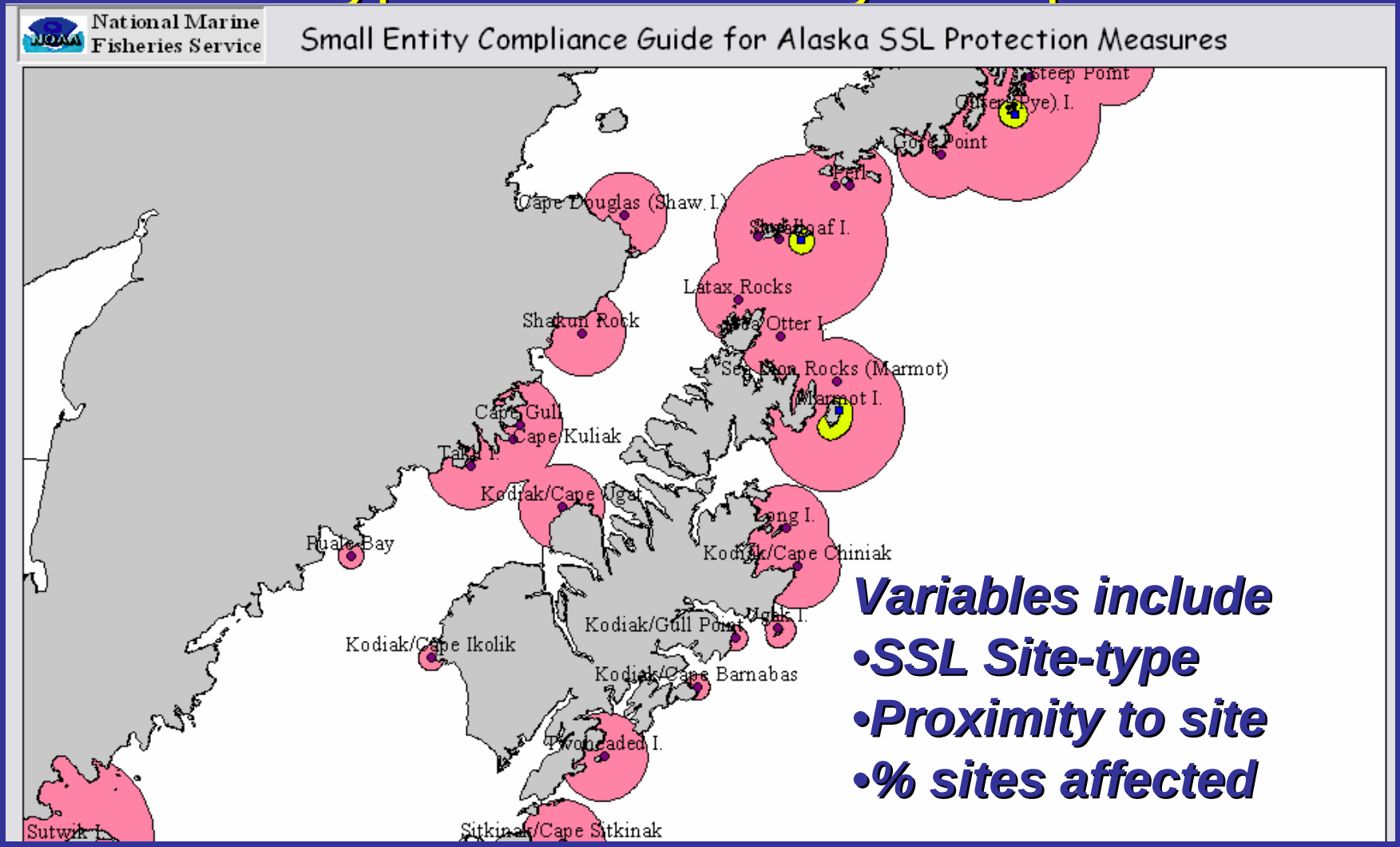
To what extent does fishing alter the (target) prey field by season, putting the percentage of removal and duration of removal in the context of the current situation?



48 possible bins

No changes in scoring or structure, and no structural adjustments

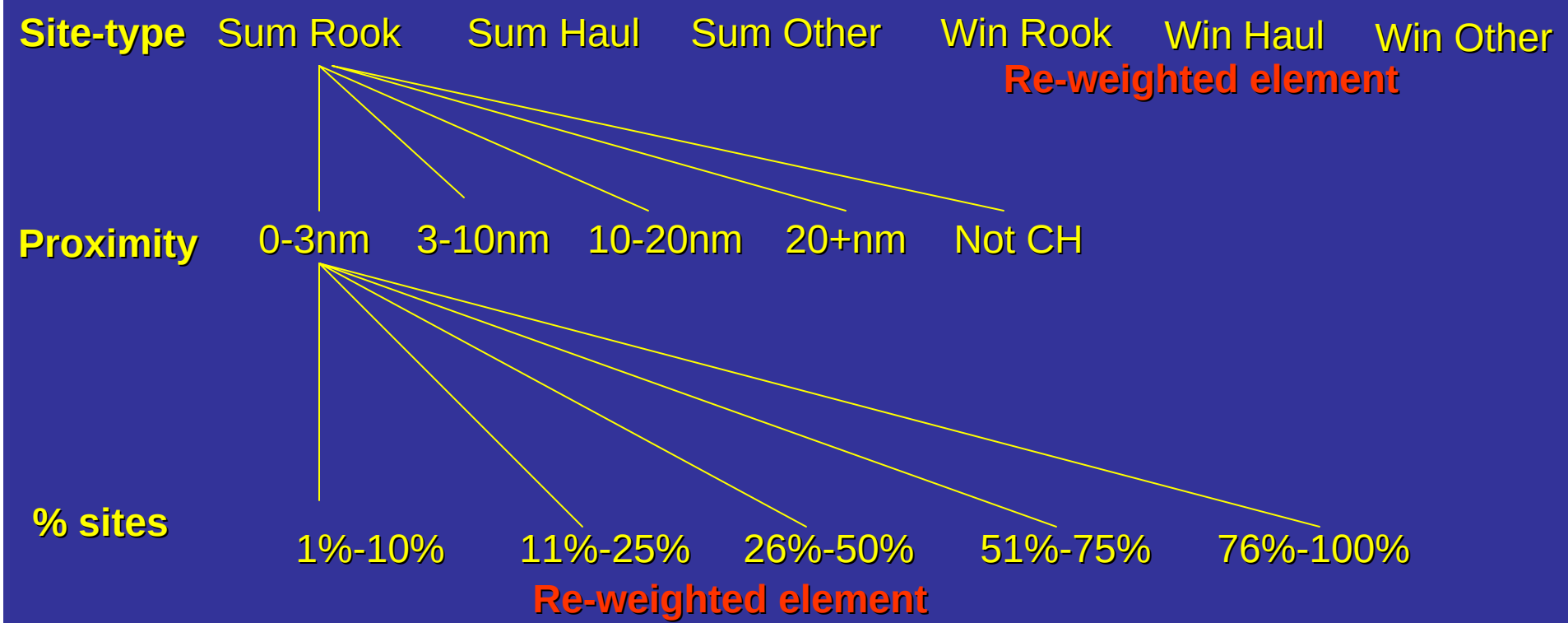
How sensitive are SSL to fishing?
Site Type and Proximity Component



Variables include
- ***SSL Site-type***
- ***Proximity to site***
- ***% sites affected***

Second Dimension - Effects of fishing on SSL - Proximity

To what extent are the SSL sensitive to fishing activity, in relation to proximity to a given site type, and the percentage of sites affected in the sub-region, by season?



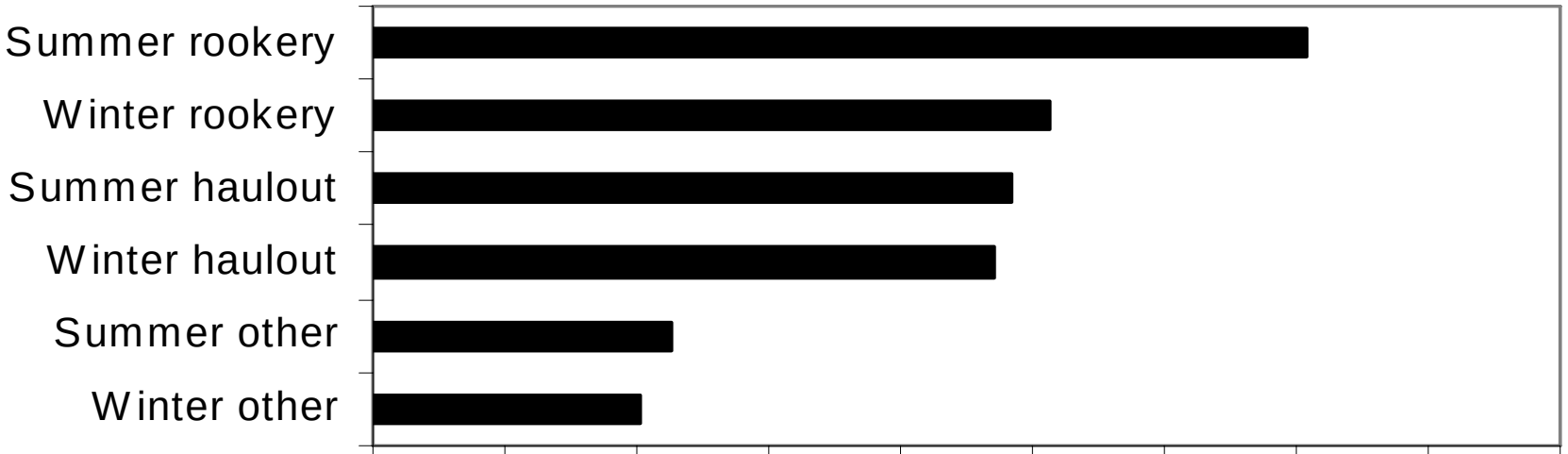
102 possible bins

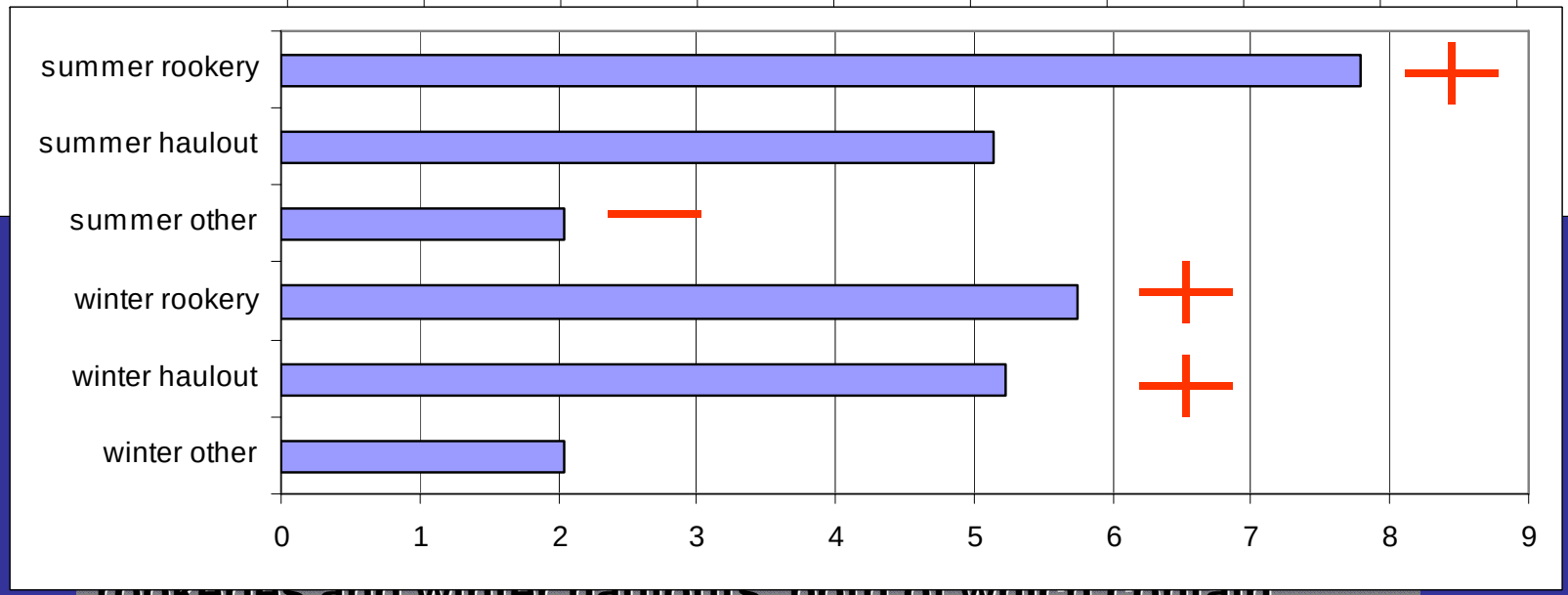
Type of SSL Site

Definitions from NMML – refer to question 32

- Summer Rookery - >50 pups counted in at least one year since 1975 (39)
- Summer Haulout - >200 non-pups counted in at least one year since 1990 (47)
- Summer Other – site does not meet minimum number of observations in the summer to count as haulout or rookery since 1990, but is still critical habitat under ESA (>200 non-pups counted at least once)
- Winter Rookery – site is a rookery in summer and a haulout in winter (>100 non-pups counted in at least one year since 1990)
- Winter Haulout – >100 non-pups counted in at least one year since 1990 (92)
- Winter Other - site does not meet minimum number of observations in the winter to count as haulout since 1990, but is still critical habitat under ESA (>200 non-pups counted at least once)

The Priority of SSL Site Type by Season



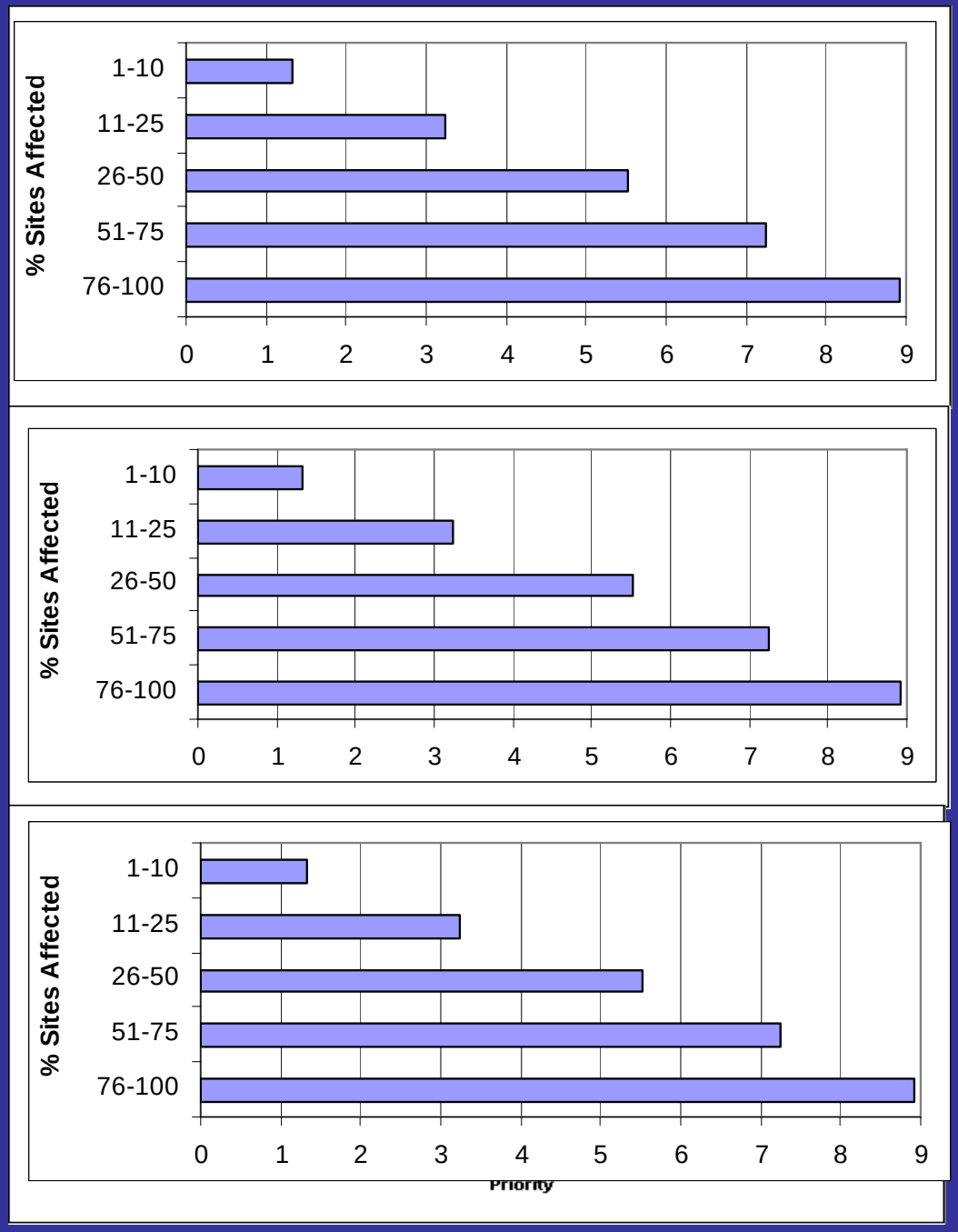


rookeries and winter haulouts, both of which contain females with dependent young.

Percentage of Sites

Within each site-type and proximity grouping, how many sites are affected?

- *1-10%*
- *11-25%*
- *26-50%*
- *51-75%*
- *76-100%*



The interaction of distance zones and numbers of sites warrants careful review; the lack of difference between impacts to single sites and multiple sites in the 0-3 mile zone is counterintuitive.

How sensitive are SSL to fishing?
Prey composition component

Menu

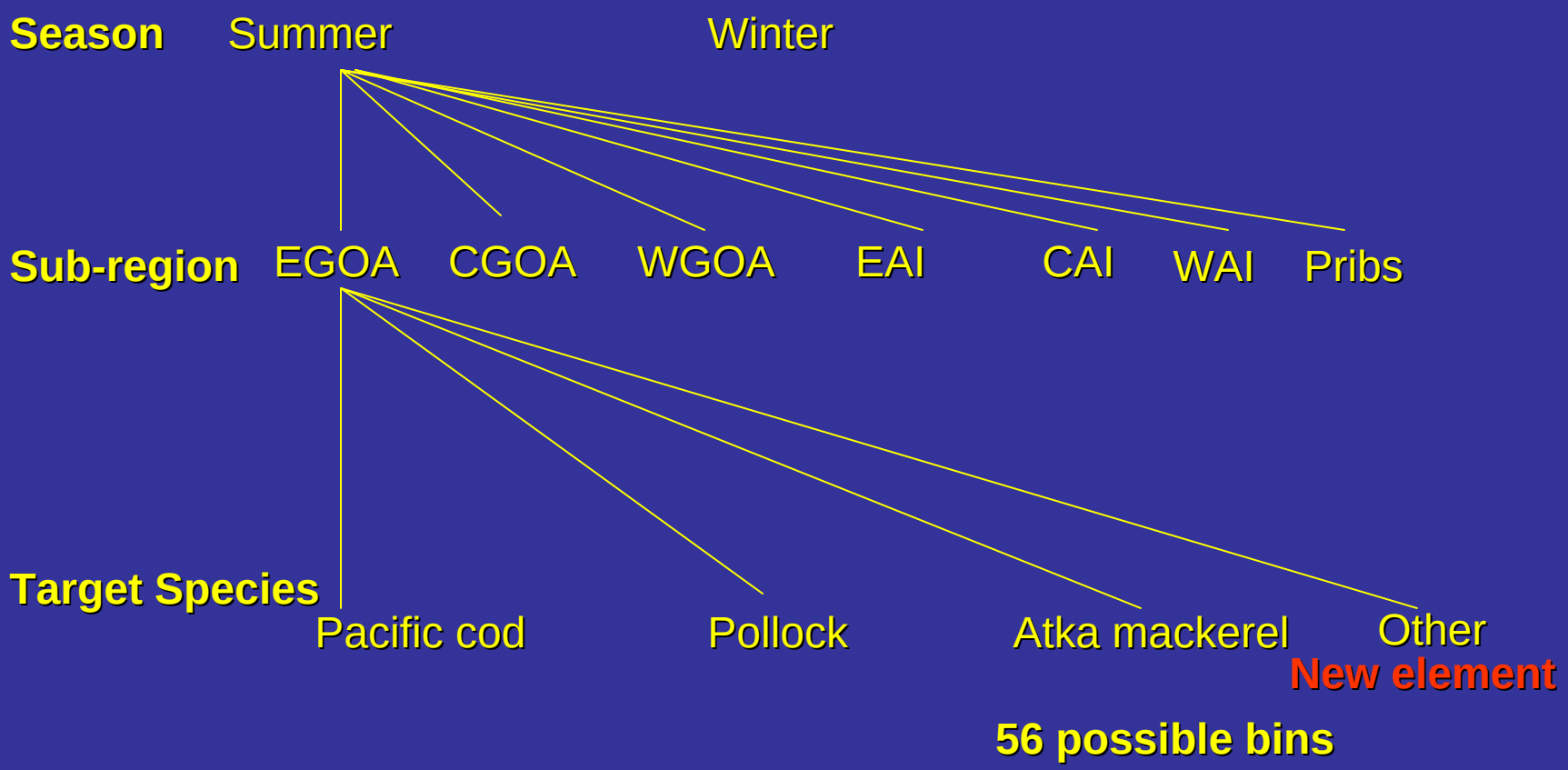
- Pollock
- Pacific Cod
- Atka Mackerel
- Herring
- Sand Lance
- Octopus
- Squid
- Salmon
- Snailfish

Variables include:

- ***Season***
- ***Sub-region***
- ***Target species***

Second Dimension - Effects of fishing on SSL - Nutrition

To what extent do the target species appear in the frequency of diet items of the SSL, by sub-region and season?

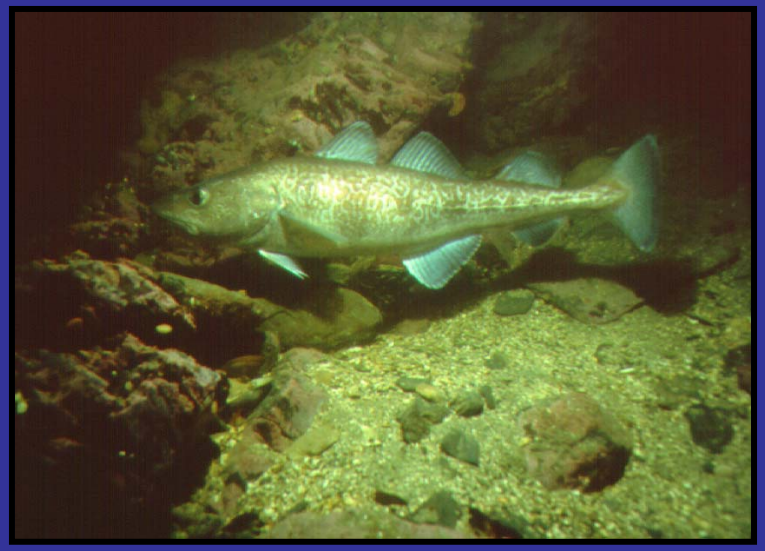


56 possible bins

Target Species of Concern

Walleye Pollock
(Theragra chalcogramma)

Pacific Cod
(Gadus macrocephalus)



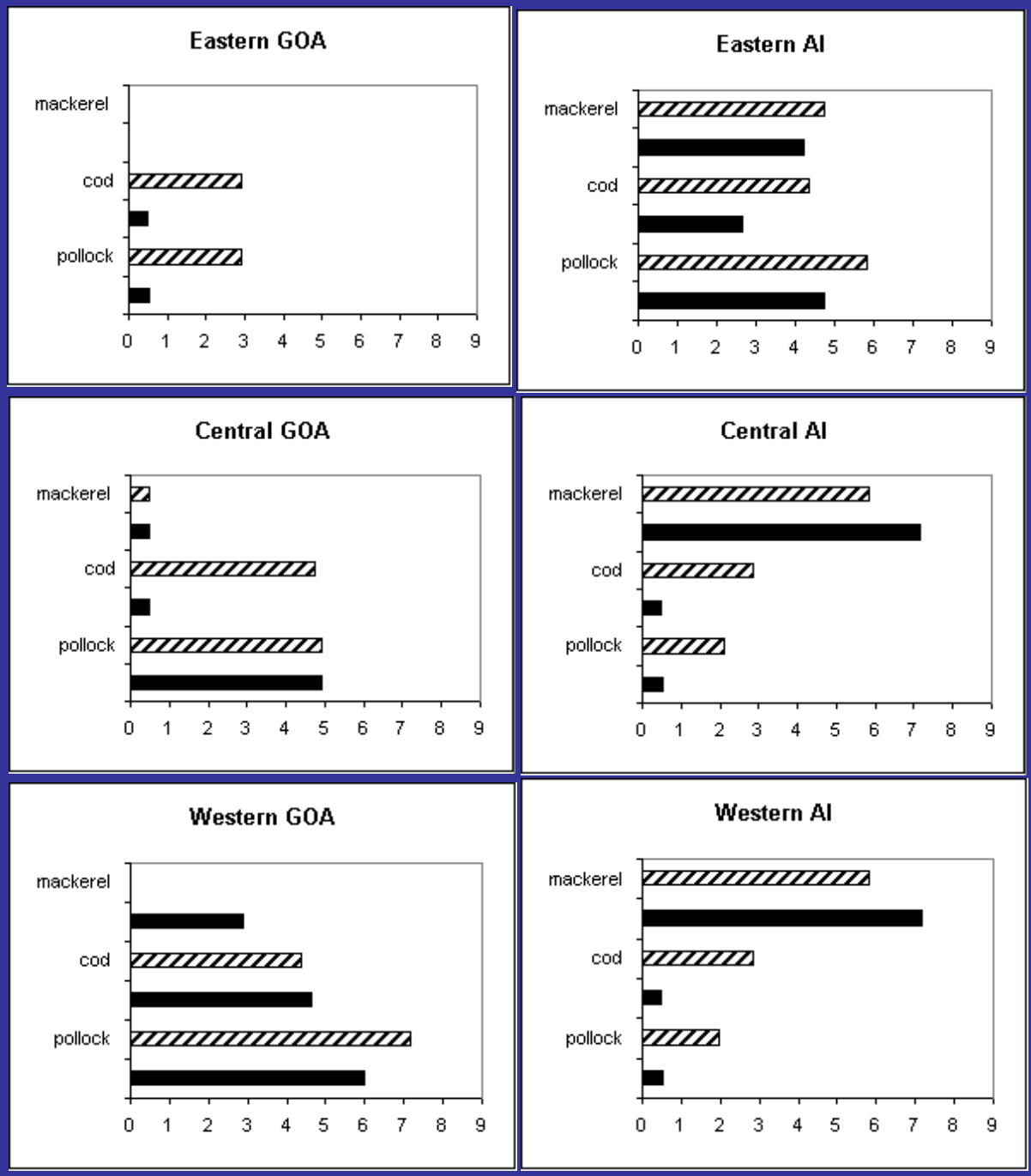
Atka Mackerel
(Pleurogrammus monopterygius)

Other species:

- Salmon
- Herring
- Arrowtooth flounder
- Sand lance
- Cephalopods
- Misc. others

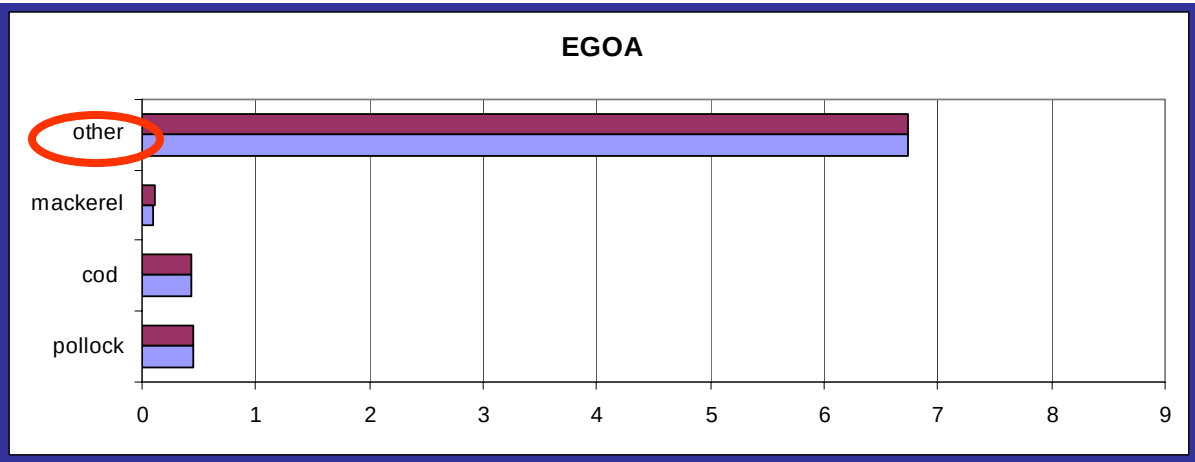
Table 3.21 Percent frequency of occurrence of prey occurring in Steller sea lion scats collected from 1999 to 2005 (NMFS 2006b).

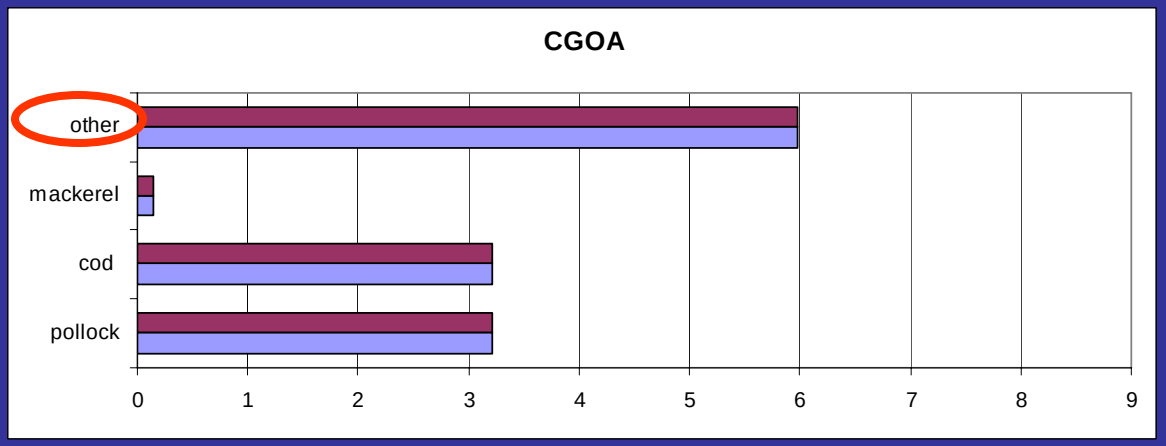
Region	Central & Western Aleutians		Eastern Aleutians		Western Gulf		Central Gulf		Eastern Gulf	Western DPS		
Season	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Summer	Winter	ALL
Number of scats	483	301	290	773	184	42	85	204	38	1080	1320	2400
Pollock	7	12	46	53	53	93	46	44	8	28	44	37
Pacific cod	6	26	18	39	36	31	2	43	5	14	37	26
Atka mackerel	96	55	32	43	21		1	2		55	38	46
Salmon	17	6	38	25	57	17	56	29	84	35	21	27
Herring			35	1	3	2	12	12	24	12	2	6
Sand lance	4	1	34	28	65	17	16	38	39	25	23	24
Arrowtooth	1	1	8	21	14	7	45	31	5	9	17	13
Irish Lord sp.	3	23	11	33	13	5		17		7	27	18
Sand fish	1	5	16	11	3	7		13		5	10	8
Halibut		1	1	10	4	5	4	12		1	8	5
Cephalopods	13	18	7	4	1		5	7	3	8	7	8
Rock sole	0	6	19	14	9	5		7		7	11	9
Snailfish sp.	1	12	1	14				4		1	12	7
Capelin			2	0	3		13	4	13	3	1	2
Poacher sp.			14	1						4	0	2

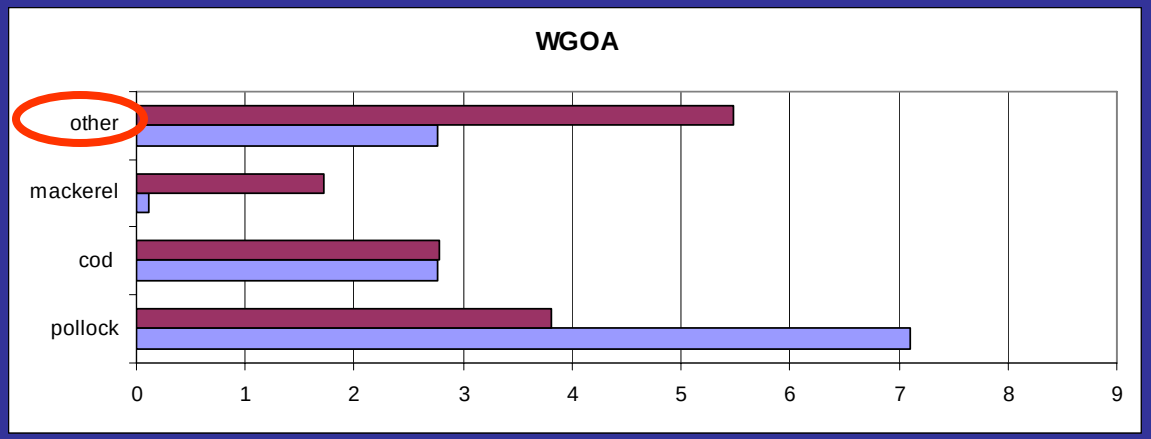

Eastern GOA
mackerel
cod
pollock
0 1 2 3 4 5 6 7 8 9
Eastern AI
mackerel
cod
pollock
0 1 2 3 4 5 6 7 8 9
Central GOA
mackerel
cod
pollock
0 1 2 3 4 5 6 7 8 9
Central AI
mackerel
cod
pollock
0 1 2 3 4 5 6 7 8 9
Western GOA
mackerel
cod
pollock
0 1 2 3 4 5 6 7 8 9
Western AI
mackerel
cod
pollock
0 1 2 3 4 5 6 7 8 9

Winter

Summer

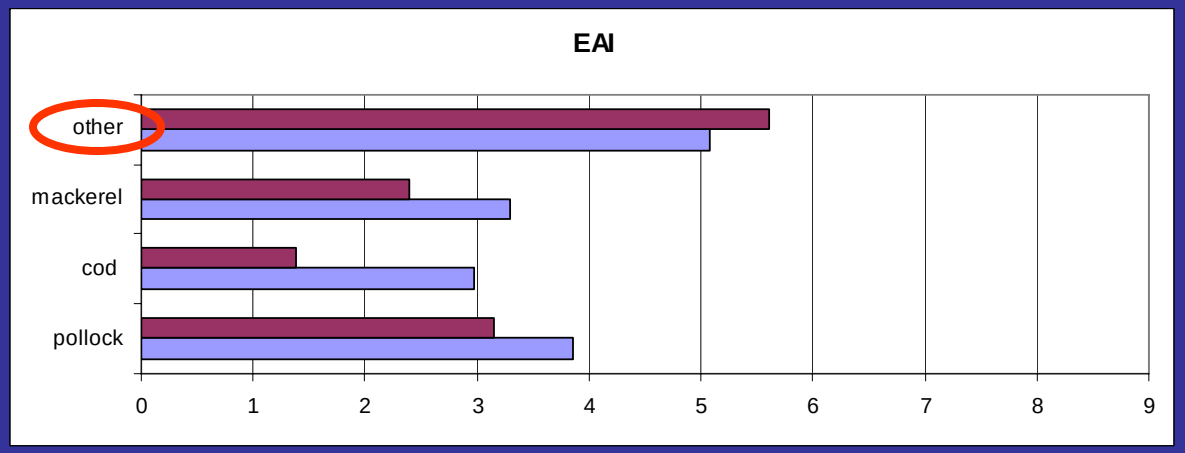


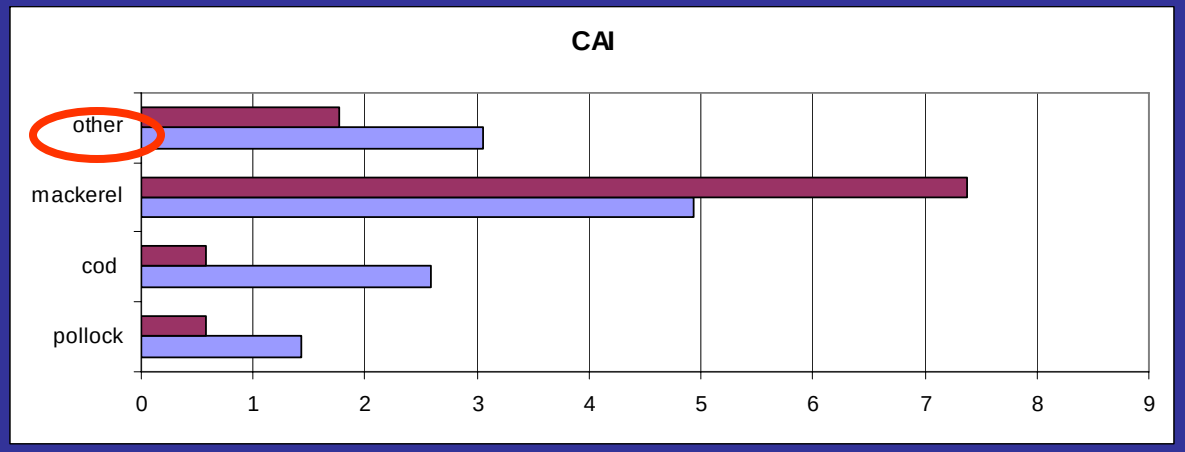


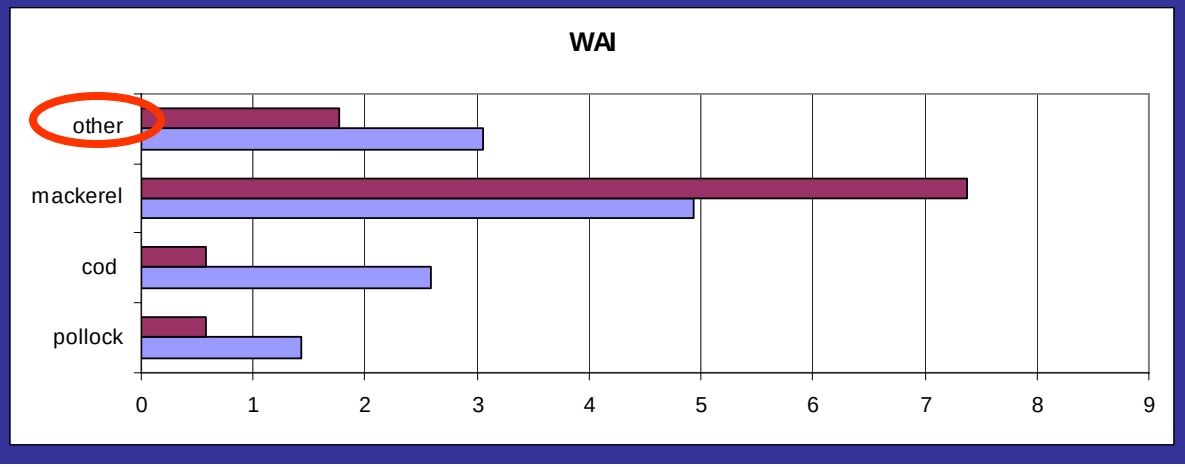


Winter

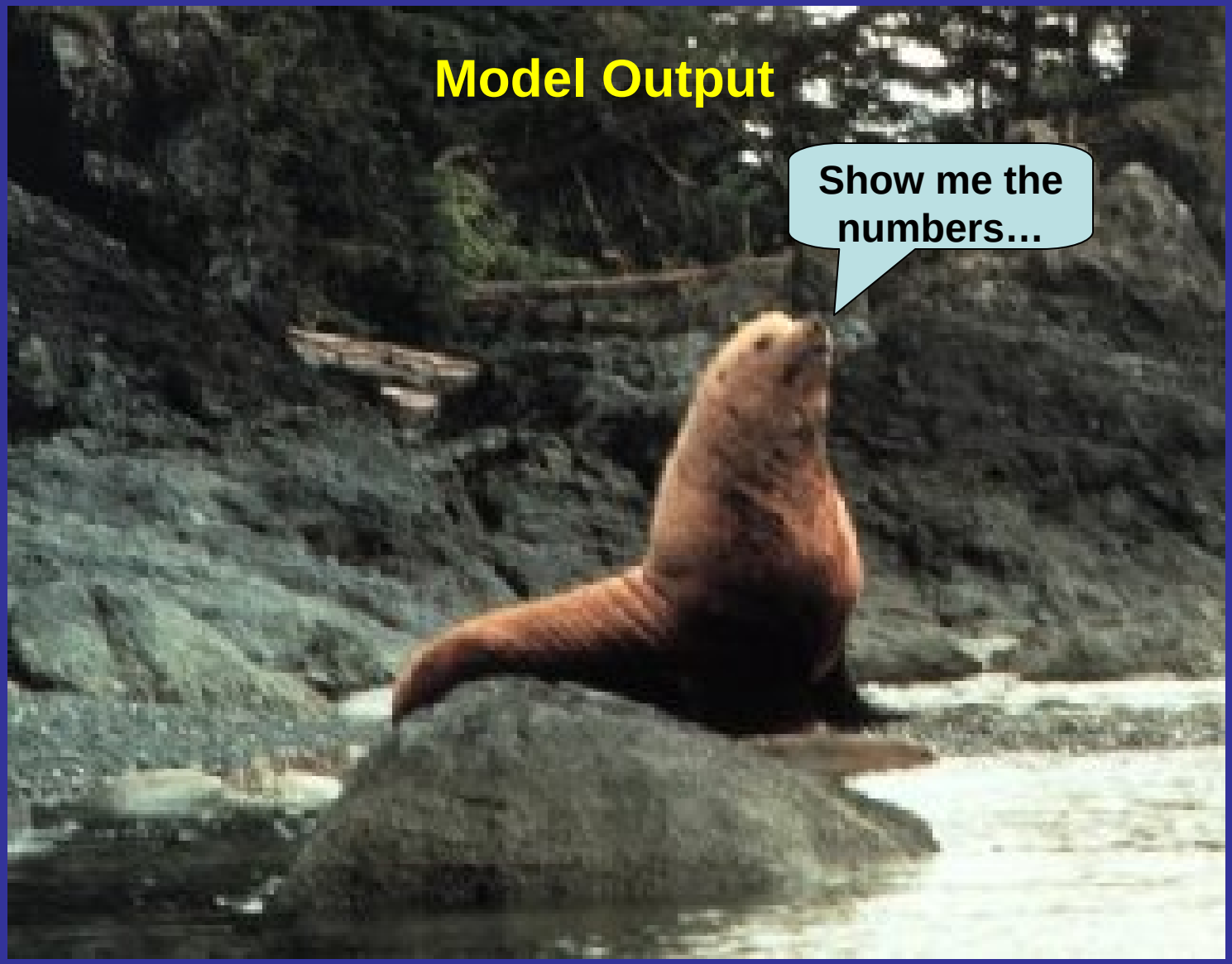
Summer







SSLMC Proposal Ranking Tool



Model output

Model variable definitions for proposals

- April 16 subcommittee SSLMCPRTSSC
  - Report from Dan in Juneau
- Monday and Tuesday process
  - Changes
    - % of HOs and RKs are calculated from latest NMML info and regions
    - % TAC updates
- Results from original 32 proposals
  - #5 and #6 retracted earlier
  - #24 and #7 retracted Tuesday and replaced by #33
  - Timing and process issues…
    - 6 proposals do not fit into model (1, 31, 32, 13, 23, 33)
    - Several near-zero scores

Model output - weights

Model weights

- Spreadsheet handout
- Electronic copy available upon request (will go on the next CD)

-Important to note the number of bins (206)

- results in small scores for individual proposals

Model output - Scores

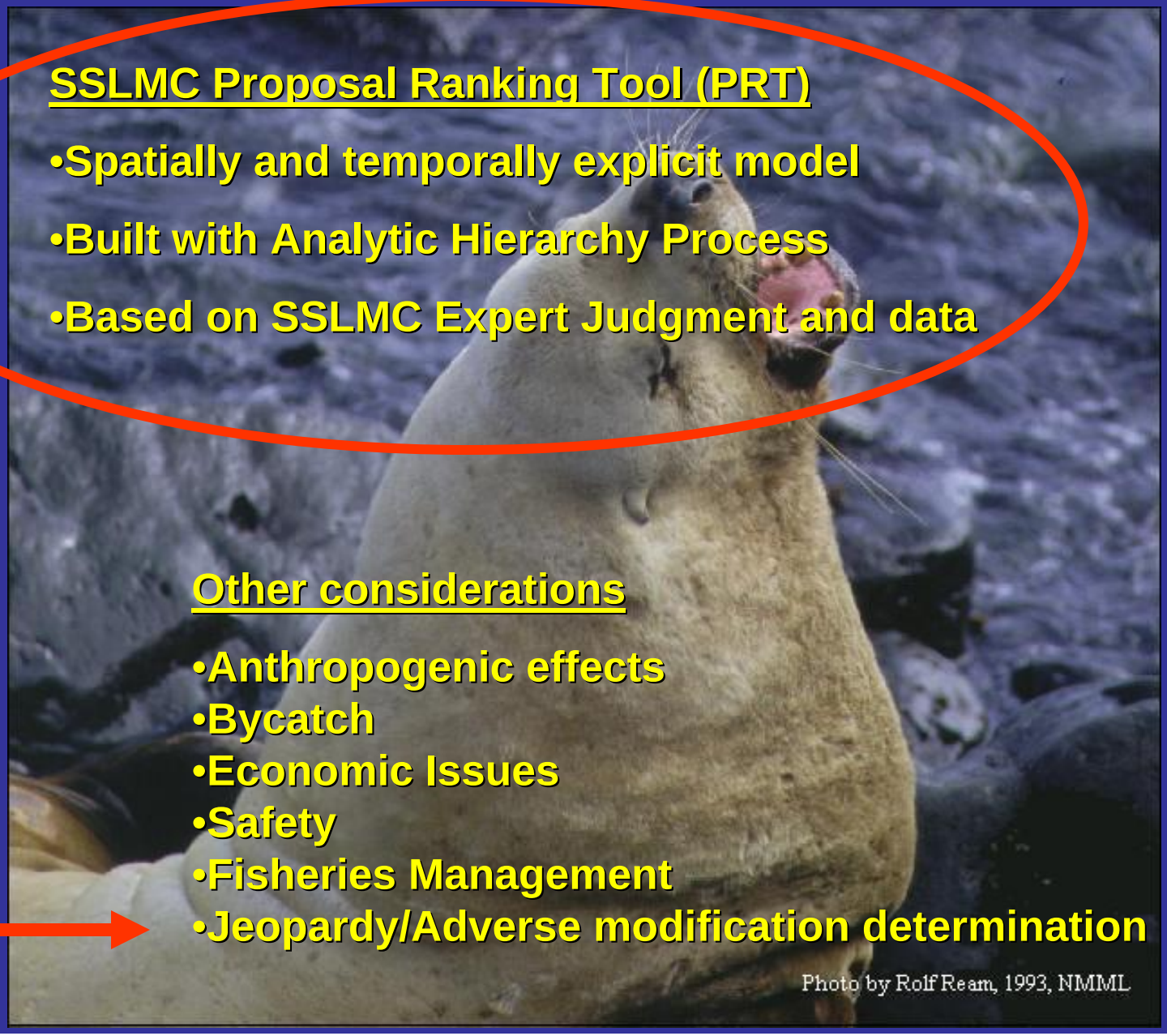
What do the numbers mean mathematically?

Relative Ranking of SSLMC collective judgment about the impacts of each proposal to SSL, both effects to the prey field and effects to SSL through proximity and nutrition

ABSOLUTE NUMBERS ARE MEANINGLESS

ONLY RELATIVE RANKING IS OF INTEREST

Revisions to SSL Protection Measures



SSLMC Proposal Ranking Tool (PRT)

- Spatially and temporally explicit model
- Built with Analytic Hierarchy Process
- Based on SSLMC Expert Judgment and data

Other considerations

- Anthropogenic effects
- Bycatch
- Economic Issues
- Safety
- Fisheries Management
- Jeopardy/Adverse modification determination

Photo by Rolf Ream, 1993, NMML

MODEL OUTPUT SCORES HAVE NO INDICATION OF A JEOPARDY OR ADVERSE MODIFICATION OF CH DETERMINATION

Model output - Scores

The scores…

Individual scores are very small numbers because the total weight of 1.0 is divided up into 206 ‘bins’

Look at the model weights handout

Relative significance of proposed changes in fishery regulations that pertain to SSL and their prey

Effects of fishing on fish

How does fishing alter the prey field?

Season
- Summer
- Winter
- Summer-Winter
- Winter-Summer

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- Shorter
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Effects of fishing on SSL

How sensitive are SSL to fishing?

Site-type
- Summer Rookery
- Summer Haulout
- Summer Other
- Winter Rookery
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Proximity
- 0-3 nm
- 3-10 nm
- 10-20 nm
- 20+ nm
- Not CH

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How often do target species occur in SSL diet?

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Target
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- Pollock
- Atka mackerel
- Other

.0624 'High' Score

May 2007
SSLMC PRT

Relative significance of proposed changes in fishery regulations that pertain to SSL and their prey

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- Other

.00000005 'Low' Score

May 2007
SSLMC PRT

Model output - Scores

Remember, high scores indicate greater impact to SSL (in the SSLMC's opinion)

Since we are measuring impact:

- positive net score indicates negative impact to SSL
  - Shifting TAC for prey species into a season in which the prey is more important to SSL
  - Opening a previously closed area of CH to fishing effort
- negative net score indicates positive impact to SSL
  - Either the proposal contains protection outright (Dalnoi) or
  - The proposal results in a situation that is of less impact to SSL than status quo

Hypothetical high .0624
Hypothetical low .00000005

Model output - Scores

PRT scores…

I reported actual scores and net scores.

Net scores remove the effect of status quo.

Actual net scores ranged from

High .0248

Low -.0087

0 score indicates undetectable effect from PRT when rounded to 5 decimal places

2 Handouts

Model output - Nutrition

- Nutrition scores – used 3rd arm of the model only and without removing status quo to give some kind of indication about the importance of that fishing activity in the diet of SSL in that area and season
- Again, positive and negative scores based on main model score and WORST CASE SCENARIO
- No net score reported

Can NOT add number to PRT output!!!

- Just another piece of information to be considered