September 1989, Seattle, WA.
You are a marine mammal biologist assigned to the Steller sea lion status review team.
The National Marine Fisheries Service has initiated a status review due to reports back
from the 1989 summer field season of range-wide (Russia to SE Alaska) declines of 60-
80% in Steller sea lions relative to 1979. It is your job to determine whether the species is
warranted for listing as threatened or endangered under the Endangered Species Act.

Year	Pups (actual)	NonPups (trend count)
1979	19886	32861
1984	15019	
1985		17267
1986	11598	
1989	6394	9728

Presenting your findings
As a mock member on a status review team, you are under strict guidelines about what
you can and cannot consider in your evaluation of whether SSLs should be listed. The
listing determination must be based solely on the best scientific and commercial
information available (just use what you're given in the lab). You cannot consider
economic impacts in making your species listing determination.
- Do not refer in your summary to the Alaska fishery which overlaps with the SSL
  range.
- That the SSL is a top predator is irrelevant at this point and that it is a large
  charismatic mega-fauna is irrelevant. Its life history is relevant, however.
- At this stage, do not do "what if there were a big tanker accident" scenarios unless
  you have data on the risk of that and the projected number of Steller sea lions that
  would be impacted.
- That the decline may be caused by natural factors is irrelevant at this point, since
  the ESA specifically says that species can be listed due to natural factors.

**Decisions by federal agencies (and you're pretending you're representing one) will
be subject to legal review under the "arbitrary and capricious" standard of legal
review.**
"The duty of a court reviewing agency action under the "arbitrary or capricious"
standard is to ascertain whether the agency examined the relevant data and articulated
a rational connection between the facts found and the decision made."
This means basically you need to make a reasonable argument based solely on the
relevant data.

For the lab:

1. Each group will give a brief PowerPoint presentation at the end. Two groups on a listing determination and two groups on management actions.
2. Decide who will give the presentation and designate someone to take notes and write the PowerPoint presentation slides (1-5) as you go.
3. Open SSLLab.xls
4. Go through Step 1 to determine what changes in juvenile survivorship, adult survivorship, and fecundity best fit the data. Decide on a strategy for exploring this. Note there is not one single answer.
5. Go to step 2 and assess the extinction risk – however your group chooses to define it – using the answer from step 1.
6. [Listing groups] Go to step 3 and make a plot of extinction risk for different parameter combinations from step 1. See details on page 3 for your group's presentation.
7. [Management groups] Go to the Management steps and calculate the elasticities to assess what vital rate is most sensitive. In step 2, you'll project some survivorship and fecundity changes forward. See details on page 4 for your groups' presentation.

Listing groups:

Your presentation will present your listing or no-listing recommendation to the group and your rationale for your decision. Your recommendation should be based solely on the definition of endangered and threatened under the ESA. Given the definitions, you need to answer to 2 questions:
- Is the decline affecting a significant portion of the range (Figure 1)?
- Is the population in danger of extinction?

The definitions are vague as to what constitutes 'danger of extinction' and your group will have to decide exactly how to interpret that.

Definitions from the Endangered Species Act
Endangered is defined under the ESA as "any species which is in danger of extinction throughout all or a significant portion of its range."

Threatened is defined under the ESA as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

Some things to address as you prepare your presentation
Your group needs to decide what # of individuals represents 'extinction', and give a rationale for your decision. Imagine that you were arguing your # against another group arguing a higher or lower number. Do you feel you can give a rational argument that your # is neither overly pessimistic nor overly optimistic?

You should talk about how density-dependence might influence your conclusions (are your conclusions worse-case or best-case?). Mention if there is anything special about marine mammal life history (that you can think of) that would positively or negative affect extinction risk. Address the argument that nonpup numbers could be artificially too low. Maybe nonpup number are down because in the 1980s they just stay in the water more (and are unobservable). Give that this is possible, would you change your recommendation? Why or why not?

You can use the background info on SSL life-history at
http://nmml.afsc.noaa.gov/AlaskaEcosystems/sslhome/StellerDescription.html.
A map of distribution and declines across other regions is attached below.

Remember you are not trying to get the RIGHT answer. You're practicing making reasonable arguments from what you know about biology, data you have and models.

Management groups:

There are three main impacts that you, as a mock scientist on the 1989 status review team know are going on:

1. Intentional shooting of Steller sea lions. This occurs both as part of fishing operations (to protect gear) and possibly by people going to rookeries.
2. Unintentional deaths due to getting caught in fishing nets (bycatch).
3. Intentional or unintentional harassment by fishing or other vessels near rookeries during the breeding season.

#1 and 2 affect adult and juvenile survivorship. #3 may affect fecundity and juvenile survivorship.

Your job is to present some immediate management actions along with a rationale and analysis supporting your recommendations. Your decisions will be subject to legal review, and recommending to do every possible action "because it could possibly help" would not pass the "arbitrary and capricious" legal standard. You need to show an analysis to justify your recommendations.

Note: if the species is listed, the ESA makes killing SSLs illegal. What you need to recommend is how to enforce that and how aggressively it needs to be enforced. To answer this you need to analyze a) how sensitive is the population decline to survivorship and b) how much of a change in survivorship would be needed to significantly affect the current rate of decline and extinction risk.

The impacts above are known impacts. But mainly other impacts are not so clear. There are many other POSSIBLE impacts that could reasonably be affecting SSLs. In your summary slides, reason what these might be and make some recommendations about how you might find out whether those are negatively impacting SSLs.

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USSR

Alaska

Bering Sea

8
Eastern
Bering Sea

2
Eastern
Gulf of
Alaska

1
Southeast
Alaska

3
Central
Gulf of
Alaska

4
Western
Gulf of
Alaska

7
Western
Aleutian
Islands

6
Central
Aleutian
Islands

5
Eastern
Aleutian
Islands