Lingcod

STAR Panel Report

Alasakan Fisheries Science Center
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STAR Panel members:

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STAT Team Members present:

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Overview

Lingcod has been assessed since 1986 and most recently in 2003. The resource is assessed as northern and southern components (LCN/LCS). Both components are designated as overfished stocks and currently being managed under rebuilding plans. This stock was brought forward to this Panel because the previous STAR did not accept the assessment. The main issue was the difficulty in seeing the foundations in the data for the two strong recent yearclasses in LCN.

The underlying input data received considerable scrutiny which allowed this STAR to accept the LCN and LCS models. The models are unchanged from the earlier STAR and are felt to be adequate for the generation of management advice. The coastwide depletion was estimated to be 64%, with 87% for LCN and for LCS 24%.

Analyses requested by the STAR Panel

1) LCN Because of the possibility of cryptic biomass, try a run with at least one selectivity asymptotic. Commercial female selectivity would seem to be the one most similar to an asymptotic pattern and it could be used as a sensitivity at least.

This was done for both areas by having the female commercial selectivity asymptotic. In LCN, the initial biomass fell about 30% which is consistent to the reported cryptic biomass proportion presented at the pervious STAR.. In LCS, the asymptotic run reduced biomass by about 10%

2) The contributions of the age compositions to the estimates of the high year classes are high and potentially driving the model. To explore their contributions two retrospective analyses are requested. First, take out the triennial survey for 2004,and then remove both 2004& 2001 (remove both comp's and cpue) Second, step back through the commercial comps, 2004 – to 2001, sequentially and cumulatively.

The underlying data presented in several ways comparing LCN and LCS. The strong LCN recruitments were evident in commercial and survey data. When these data were removed from the LCN

3) The cv's on the 1986 and 1995 surveys may be too tight and could be relaxed which may have an affect on subsequent recruitments. As a trial, add the overall rme to the variance on these two survey points.

Not done because of time constraints.

4) When a base model is defined, iteratively balance the model with effective N and variances. It is recommended to do the abundance indices first and then the comps.

This was not done; the STAT mentioned that the model had been previously balanced by dividing the inputs by 10. See request 8 below.

5) As a data summary, plot average comps and then superimpose recent comps.
Results show strong1999 and 2000 yearclasses with respect to average distributions. Some yearclass smearing in the commercial

6) Consider lowering the 1999 and 2000 yc's as an alternate state of a nature
This was done by removing the 2001 and 2004 surveys in LCN.

7) Proceed with base model for LCN and LCS. For LCN, uncertainty will be captured by using two of the sensitivity models presented today (no 2001 and no 2001, 2004 survey inputs) Both of these are more pessimistic than the base case. For LCS, uncertainty will be captured from the analytical approximation of the terminal biomass estimate.
Results in terms of decision tables were presented for LCN and LCS. The alternate state of nature for LCN was with the 2001 and 2004 survey points. A same approach was used in LCS.

8) Because the STAT chose not to balance the model, a request was made to show a diagnostic plot of neff vs inputs.
These were presented and the practice of dividing by 10 looked roughly appropriate.

9) An apparent problem was seen in the LCN initial biomass in AB and AA runs in the decision tables. Should be resolved.
This was resolved and new estimates were presented.

10) Need to get the right starting populations for alternate states of nature for LCS. They will be chosen from plus and minus 1.25 standard deviations from the Hessian. In order to get the right size population to start the decision tables, it is recommended to first try perturbation to catches, then try a fake survey with high weight and finally try altering M.
This was done using pertebatinos to the catch stream.

Final base-cases models and quantification on uncertainty

The two region model had the following parameters in common.

M = 0.18F / .32M
SigmaR = 1
h = 0.90
VonBartalanfy growth fitted externally for males and females and for north and south

LCN

Catch1956-2004

Abundance indices:

Trawl CPUE 1976-1997
Triennial survey 1977 – 2004

Length frequencies:
Recreational 1981-1983
Commercial 1975-1978
Triennial survey 1986, 1989

Age frequencies:
Recreational 1980, 1986-2004
Commercial 1979-2004
Triennial survey 1992 – 2004

Selectivity
Commercial – domed or asymptotic
Recreational - domed
Survey - domed

LCS

Catch1956-2004

Abundance indices:
Trawl CPUE 1978 -1997
Triennial survey 1977 – 2004

Age frequencies:
Recreational 1992-1998, 2000-2004
Commercial 1992-1998, 2000-2004
Triennial survey 1995-2004

Selectivity
Commercial – domed
Recreational - domed
Survey - domed

In the LCN model, uncertainty was captured by reducing the magnitude of the two strong 1999 and 2000 yearclasses. This was done by removing the 2001 and 2004 survey data and composition data from the fiery from 2001 onward. This represents a one-sided ranging of uncertainty. For LCS, the uncertainty was described as the Hessian approximation to the variance of the SSB and plus/minus 1.25 standard deviations to correspond to the 12.5 and 87.5 percentiles. Catch was varied to produce population sizes in 2005 for starting the projection in decision tables. As both h and M are fixed, this represents a considerable underestimate of the estimation uncertainty.

Technical merits and/or deficiencies in assessments

The STAT Team is commended for their effort in producing the large number of analyses carried out in preparation before and during the STAR Panel.

Because of time constraints, the degree to which diagnostics (sensitivities, retrospective residual…) were reviewed, especially for LCS, was limited.

Areas of disagreement

There were no significant areas of disagreement within the STAR Panel nor between the STAR and the STAT.

Unresolved problems and major uncertainties

There were no unresolved problems with the models. The main sources on uncertainty are related to data paucity.

Recommendations for future research (none were presented, these are from August STAR)

1) There exists some RecFIN data for Oregon which may help in determining the strengths of recent yearclasses.

2) Consider the application of biological association filters (Stephens and MacCall, 2004) to the commercial and recreational(?) data.

3) Investigate the possibility of an index of abundance to be defined from observer program data. This is especially important as traditional CPUE data is strongly affected by recent management regulations.

4) As they are so critical to rebuilding, it is imperative to understand the source of strong yearclasses in the north in the data.