**Pacific Hake Objectives**

*B* = Spawning stock biomass, *V*=vulnerable (exploitable) biomass, *C* = Coastwide catch (retained plus released), AAV = average absolute catch variation, *T* = Maximum projection years, *T*min is time to rebuild state in absence of fishing, *B*rebuild is the spawning biomass where the stock is considered “rebuilt”.

Objectives identified by the JMC and alternative (Alt) candidates in italics appear in the following table.

| **ID** | **Goal** | **Objective** | **State** | **Probability** | **Time Period** |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Manage the Pacific Whiting resource in a precautionary and sustainable manor.** | | | | | | | |
| 1 | Minimize risk of severe overfishing and closing the fishery | Spawning biomass is above 10 percent of unfished biomass in 95 percent of the years over a 30-year period. | *B* > *B*10%P | 0.95 | *t*=1,…30 |
| 2 | Minimize the risk of the stock dropping below **a threshold that impairs recruitment**. | Spawning biomass is above 40 percent of unfished biomass in 75 percent of the years over a 30-year period. | *B* > *B*40% | 0.75 | *t*=1,…30 |
| 3 | If the stock drops below a **threshold that impairs recruitment**, minimize the risk that the stock stays below the threshold for consecutive years | If the stock drops below [40] percent of unfished biomass, the probability that it stays below the threshold for more than [3] consecutive years is less than [10] percent. | *B* > *B*40% | 0.90 | *t*=1,…30 |
| *Alt 3.* | *Avoid closing the fishery.* | *Fishery is open in both Canada and the US in 95% of the years over 30 years. Remember that in future the point at which fishing is curtailed may be above B10% – think about the depletion level of the worst fishing ever – it was above B10%.* | *Fishery open in at least trunc(0.95\*30)=28 years for Canada AND USA (both states must be true).* | *0.95* | *t=1,…30* |
| **Both parties can achieve their intended benefits under the treaty.** | | | | | | | |
| 4a | Each country has the opportunity to attain their allocation of the TAC as specified in the treaty. | The [exploitable] biomass in Canada during the fishing season is greater than their allocated TAC > [90] percent of years over a 30 year period | *V* > TAC |  |  |
| 4b |  | The [exploitable] biomass in US waters during the fishing season is greater than their allocated TAC > [90] percent of years over a 30 year period | *V* > TAC |  |  |
| *Alt. 4* | *Achieve a spawning biomass target so that both parties can obtain benefits.* | *The spawning biomass is greater than a target biomass with probability 0.5.* | *B > 1.2B40%* | *0.5* | *30* |
| **Yield Objectives** | | | | | | | |
| 5 | Minimize catch variability. | *Given 1-3(or 4) are satisfied*: Year to year changes in catch should average less than 15% with 75% probability.  OR, cast it as slow up, fast down by limiting increases to catch, but not decreases. | AAV < 15% | 0.75 | 1,…,*T* |
| 6 | Maximize catch. | *Given 1-5 are satisfied*, achieve maximum coastwide catch. | max(*C*) |  | 1,…,*T* |

**NOTES:**

1. This table will need a matching table of explicitly defined performance metrics to ensure the Objective is stated as desired.