



NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

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Action Memo

File Number:Cons 16-023

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Dan Hull, Chairman
Chris Oliver, Executive Director

SUBJECT:
EFH Fishing Effects Methods/Criteria (SSC Only)

STAFF CONTACT: Steve MacLean

ACTION REQUIRED:
Review and comment on draft Fishing Effects analysis methods.

BACKGROUND:

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires regional Fishery Management Councils to describe and identify Essential Fish Habitat for all fisheries and to minimize to the extent practicable the adverse effects of fishing on EFH. The Final Rule for EFH requires this information to be reviewed every five years. The NPFMC is currently evaluating potential updates to EFH in its Fishery Management Plans as required by MSA, including reassessing the adverse impacts of fishing and non-fishing activities on EFH. At initial review of new EFH descriptions in April 2016, the SSC recommended, and the Council approved, that new criteria to evaluate the potential impacts of fishing on EFH should be developed. A subcommittee of the SSC was formed to develop the new methods, this discussion paper presents the subcommittee's draft proposed methods to evaluate the effects of fishing on EFH.

In 2005, the EFH EIS concluded that fisheries have long term effects on habitat, but those impacts were determined to be minimal and not detrimental to fish populations or their habitats. In 2010, fishing effects were again analyzed, employing the Long-term Effects Index (LEI), which estimated the eventual proportion of reduced habitat features from a theoretical unaffected habitat state, assuming that current fishing patterns occurred indefinitely.

For the current review cycle, the Council requested several updates to the LEI. In response, the Fishing Effects (FE) model was developed. The FE model updates the LEI Model in several ways: (1) the FE model is cast in a discrete time framework allowing impact and recovery rates to be used to estimate proportion of reduced habitat, (2) the FE model implements sub-annual tracking to allow estimates of habitat disturbance for any month from January 2003, (3) the FE model utilizes the Catch-In-Areas database to provide the best available spatial data of fishing locations, and (4) the FE model incorporates a global literature review to estimate impact and recovery rates. In April 2016, the SSC felt that updated EFH and FE models could allow a more systematic method to assess the effects of fishing on EFH.

The Fishing Effects subcommittee recommends a three-tiered method to evaluate whether there are adverse effects of fishing on EFH. As shown in Figure 3, on page 11 of the Discussion Paper, the first consideration of effects is at the population level: is the population above or below MSST. Next stock assessment authors will consider whether the reduction of habitat in the "Core Essential Area" (CEA) is 10% or more. The CEA is defined as the 50% population quantile threshold in the EFH maps reviewed in April 2016. If more than 10% of the CEA is impacted by fishing, the stock assessment authors will examine indices of growth-to-maturity,

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spawning success, breeding success, and feeding success to determine whether there are correlations between those parameters and trends in the proportion of the CEA impacted by fishing. If a correlation exists and the p-value is less than 0.1, the authors will determine whether there is a plausible connection to reduction in EFH as a cause, or if the result is spurious. A p-value of 0.1 has been selected to address the possibility of Type II error. If stock assessment authors determine that the correlation between impacts to the CEA and life history parameter(s) suggest a stock effect, then they will raise that potential impact to the attention of the Plan Teams, SSC, and Council.

The discussion paper presents two examples of this method applied to pollock and Pacific ocean perch EFH in the Gulf of Alaska. Although neither of those examples would normally go through the entire exercise (CEA was not reduced 10%), the subcommittee requested that the authors go through the whole exercise.

The subcommittee presented a number of questions to the groundfish and crab Plan Teams to help in the refinement of this proposed method. The subcommittee would appreciate SSC input on the same questions. The questions are:

- 1) Are the assessment cutoffs correct?
 - a) Core area = upper 50th percentile of predicted abundance or suitable habitat
 - b) Impact threshold for further impact assessment: 10% reduction in habitat
 - c) P-value of 0.1 for significance of correlation with time trend in habitat disturbance in core area

- 2) Which areas should be considered?
 - a) LME areas: Eastern Bering Sea, Aleutian Islands, Gulf of Alaska?
 - b) Regional management boundaries: 610, 620, 630, etc?
 - c) Stock boundaries: e.g., Bristol Bay for BB red king crab?

- 3) What seasons should be used for the analysis?
 - a) Summer only - best data, broadest distribution
 - b) Seasonal based on MaxEnt for non-summer habitat availability and GAMs for summer population abundance?
 - c) Average cumulative impacts over seasons by converting GAMs to MaxEnt?

The Fishing Effects subcommittee will incorporate the SSC's and Plan Teams' comments in a final discussion paper that will be presented at the December 2016 Council meeting.