Suggested additional *SLA* variants to further evaluate the proposed Makah hunt

John R. Brandon* and Jonathan Scordino#
Contact email: mtcmmbiologist@centurytel.net

ABSTRACT
At the 2012 Annual Scientific Committee meeting, the Implemenation Review for eastern North Pacific gray whales with a focus on the proposed Makah hunt and the Pacific Coast Feeding Group (PCFG) was completed. Two variants (one with research provisions) were agreed by the Committee to meet the conservation objectives of the Commission. However, the Committee also noted that the two variants did not exactly mimic the proposed hunt and expressed concern that the actual conservation outcome of the proposed hunt was not tested. The reason that an exact variant was not tested was because there is a temporal rule in the proposed hunt, such that all struck and lost whales from December through April are not counted against the Allowable PCFG Limit (APL), whereas any struck and lost whales in May are counted against the APL. There are insufficient data to determine the proportion of strikes that would occur in May or prior to May, and hence the two variants of the hunt were developed to bracket the range of possible monthly strikes. In this paper we propose the testing of six variants to span the full range of possible strikes occurring in May or prior to May.

KEYWORDS: ABORIGINAL WHALING; MANAGEMENT PROCEDURE; NORTH PACIFIC; GRAY WHALES

INTRODUCTION
At the last Scientific Committee meeting, the Implementation Review for eastern North Pacific gray whales was completed (IWC/64/Rep1 Annex E). The focus of that Implementation Review was on the proposed Makah hunt and the Pacific Coast Feeding Group (PCFG) of gray whales. Several variants of the proposed Makah hunt were examined (see SC/64/Rep3 Annex D), and the Scientific Committee agreed that two variants (one with research provisions – see below) performed acceptably in terms of meeting the aboriginal subsistence and conservation objectives of the Commission.

However, the Committee also noted that these two variants did not exactly mimic the proposed Makah hunt, and agreed that the Standing Working Group of the AWMP should develop and test an exact variant intersessionally, in order for the Scientific Committee to evaluate the results at the 2013 Annual Meeting.

The aim of this document is therefore to present a set of variants that may satisfy the request of the Scientific Committee. Background and rationale for why a set of variants (rather than a single management variant) may be needed in order to satisfy the Committee's request is outlined below.

As described in the Scientific Committee's report (IWC/64/Rep1)

"In order to minimise the risk of taking PCFG whales, the management plan developed by the Makah Tribe restricts the hunt both temporally (to the migratory season for gray whales i.e. 1 December – 31 May) and geographically (to the Pacific Ocean region i.e. the Makah U&A[1] except the Strait of Juan de Fuca). Some PCFG whales are present during the

* *Greeneridge Sciences, Inc., San Francisco, CA, USA*
# *Makah Fisheries Management, Makah Tribe, Neah Bay, Washington, USA*

[1] Usual and accustomed fishing grounds

migratory season and thus the plan proposes an allowable PCFG limit (APL) during hunts that are targeting eastern North Pacific migrating whales with the aim of ensuring that accidental takes of PCFG whales do not deplete the PCFG. Whales struck in May might have a higher probability of being PCFG whales since they feed in this area in June. The management plan thus proposes an additional requirement that all animals struck-and lost in May are assumed to be PCFG whales (i.e. count against the APL), whereas whales struck between December and April are not.

Weather conditions and availability of whales makes it likely that most hunting will occur in May. However, there are insufficient data to assess the number of strikes by month. Thus, it is not possible to reliably estimate the proportion of struck-and-lost whales that would count towards the APL. Given this uncertainty about how the plan would respond to failing to take into account struck-and-lost PCFG whales, the Tribe had proposed two SLA variants (1 and 2) spanning the options as to when the hunt might occur."

These two agreed acceptable *SLA* variants differ in the assignment of struck and lost whales to the APL. Variant 1 (agreed by the Committee as acceptable with research provisions[2]) does not count struck and lost whales against the APL. This variant therefore corresponds to the proposed hunt occurring entirely during Dec – Apr. Variant 2 assumes all struck and lost whales belong to the PCFG, and counts all struck and lost whales against the APL. This variant performed acceptably for all trials. Under the proposed hunting rules outlined above, this variant corresponds to hunting during May only.

Essentially then, the aspect of the proposed hunt that was not evaluated during the Implementation Review is the interaction between the actual number of strikes-per-month during the hunting season (Dec – May), and the assumption of whether a struck and lost whale belongs to the PCFG.

SUGGESTED ADDITIONAL VARIANTS

At present, there is no reliable way to predict the exact number (or model the probability) of strikes that may occur during a given month. However, one possible way to overcome this problem is to evaluate a variant for each possible outcome of the number of strikes by month. To simplify this approach, months can be divided into two categories (i.e. May, or prior to May), given the assumption of whether or not struck and lost whales are counted against the APL. This leads to six additional variants (which are labeled alphabetically here to avoid confusion with previously evaluated variants):

A. Allow only one strike prior to May.
B. Allow two strikes prior to May.
C. Allow three strikes prior to May.
D. Allow four strikes prior to May.
E. Allow five strikes prior to May.
F. Allow six strikes prior to May.

[2] Variant 1 performed acceptably for all trials except one, where it was deemed to have marginal performance. That trial assumes that the relative probability of harvesting PCFG whales during Dec - May is double the observed proportion of PCFG whales in the available photo-identification studies during the corresponding time period. Because the ratio of PCFG whales to migratory whales can be monitored through photo-identification studies during the hunting season, Variant 1 was agreed acceptable under the provision that annual photo-identification research be undertaken and results reported to the Committee for evaluation.

Variants 1 (all strikes prior to May) and 2 (all strikes in May) are logical bounds on this range of possibilities.

Example allocation of strikes by month

Variants (A – C) are outlined below as examples to illustrate how these variants could be modeled.

Variant A: 1 strike prior to May, 6 strikes in May

1. Compute the APL.
2. Have a strike.
3. If the whale is struck and lost, it does not count against the APL.
4. All subsequent strikes occur in May, if any of these are struck and lost, they are assumed to be PCFG whales and those strikes apply to the APL.

Variant B: 2 strikes prior to May, 5 strikes in May

1. Compute the APL.
2. Have a strike.
3. If the whale is struck and lost it does not count against the APL.
4. Have a strike.
5. If the whale is struck and lost it does not count against the APL.
6. All subsequent strikes occur in May, if any of these are struck and lost, they are assumed to be PCFG whales and those strikes apply to the APL.

Variant C: 3 strikes prior to May, 4 strikes in May

1. Compute the APL.
2. Have a strike.
3. If the whale is struck and lost it does not count against the APL.
4. Have a strike.
5. If the whale is struck and lost it does not count against the APL.
6. Have a strike.
7. If the whale is struck and lost it does not count against the APL.
8. All subsequent strikes occur in May, if any of these are struck and lost, they are assumed to be PCFG whales and those strikes apply to the APL.

Variants D-E would proceed accordingly. If this approach is deemed as an acceptable way forward by the Standing Working Group of the AWMP, there will be numerous trials associated with six additional variants. It should be possible to filter the results using the criteria and code that were developed for this task during the 2012 Annual Meeting. If there is a need to prioritize trials to be run for initial evaluation, it may be worth re-visiting the patterns observed across trials during the Implementation Review (e.g. the trial with high PCFG availability would naturally be of interest), as well as the Committee's conclusions regarding low plausibility of certain trials.

REFERENCES

IWC/64/Rep1. Report of the Scientific Committee. Panama City, Panama, 11-23 June 2012.

IWC/64/Rep1 Annex E. Report of the Scientific Committee. Annex E: Report of the Standing Working Group on the Aboriginal Whaling Management Procedure (AWMP). Panama City, Panama, 11-23 June 2012.

SC/64/Rep3. Report of the AWMP Workshop focusing on the PCFG gray whale *Implementation Review*. Annex D: Proposed Makah Hunt Plan and Alternatives for Analysis. La Jolla, CA, 19-23 March 2012.

References are available upon request from the IWC Secretariat.