

## GROUND FISH MANAGEMENT TEAM REPORT ON CONSIDER STOCK COMPLEX AGGREGATIONS

### **Introduction**

This is the third Groundfish Management Team (GMT) document presented at this Council meeting that provides stock complex alternatives along with a GMT-recommended process for reorganizing groundfish stock complexes. The first GMT document provided background information, a full description of the process, and Slope Rockfish Alternatives ([Supplemental GMT Report 5](#)). This statement provides alternatives, rationale, and the process for reorganizing the remaining complexes: Other Fish (cartilaginous fish and other roundfish), Other Flatfish, and Shelf Rockfish. Nearshore rockfish complex was not evaluated by the GMT at this meeting for reasons shown in [Supplemental GMT Report 5](#). The GMT process may be used by the Council to develop its own complex-alternative(s) based on the Council's objectives. A template is provided at the end of each section within this document that may be useful as both a summary sheet and a guide to help develop alternatives.

Recommendations to add or remove species from the Fishery Management Plan (FMP) or recommendations to designate Ecosystem Component (EC) species within a complex should be considered while using information provided by [Supplemental GMT Report 6](#). If those recommendations were made prior to creating additional complex alternatives, then those additions/removals/EC designations should be reflected in any newly created alternative below.

### **Shelf Rockfish – North and South**

Catches in the Shelf Rockfish Complexes North and South of 40°10' N. latitude has remained below the acceptable biological catch (ABC). This is largely due to the Rockfish Conservation Area (RCA) closures on the shelf, which are closed to groundfish fishing gears. Of the 32 species in these complexes, only one was found to have had its component overfishing limit (OFL) exceeded on average: tiger rockfish. However, tiger rockfish has an OFL contribution of 1.0 mt and an ABC contribution of 0.8 mt. The average catch of tiger rockfish for the years 2004 - 2011 has been 1.1 mt. This average overage of 0.1 mt (although 2011 catch was 1.6 mt) suggests that tiger rockfish could benefit from additional research but the GMT feels that it is insufficient reason to consider restructuring the management of the entire shelf rockfish complexes. The GMT discussed tiger rockfish with the Scientific and Statistical Committee (SSC). Our interpretation of their advice is that the risk does not necessarily rise to the level of pulling the stock out of the complex ([Agenda Item G.8.b, Supplemental SSC Report, September 2013](#)). The GMT is therefore not proposing any action alternatives and is recommending that no change be made to the north and south shelf rockfish complexes at this time.

### **Other Fish**

The species comprising the Other Fish complex have disparate life histories, ecological relationships, distributions, and vulnerabilities to overfishing. All the action alternatives and GMT discussion contemplated a complete restructuring of the Status Quo Other Fish complex since that aggregation of disparate stocks does not meet the purpose and need to manage stocks

with similar distributions, similar fishery interactions, similar life histories, and similar vulnerabilities to potential overfishing. The cartilaginous fish are comprised of elasmobranches species (e.g., sharks and skates) and chimaeras (e.g., ratfish).

For this document, Other Fish was divided into two groups: (a) cartilaginous fish and (b) other roundfish, similar to that shown by the Council staff analysis in June ([Agenda Item F.8.a, Attachment 1, June 2013](#)). In addition, the GMT provided one cartilaginous fish alternative and one roundfish alternative in June under [Agenda Item F.8.b, Supplemental GMT Report 2, June 2013](#). Those GMT alternatives are also shown in this section.

In addition to Status Quo and the GMT alternatives that were provided in June, results of our process may be used to create additional alternatives (shown below). The Council may use the results of this process, along with information provided in Status Quo, Cartilaginous Alternative 1, and Roundfish Alternative 1 to create additional alternatives that better fit Council objectives.

### **Status Quo Cartilaginous Fish Alternative**

The cartilaginous fish stocks in the FMP, including those managed in the status quo Other Fish complex, are depicted in Table 1.

Table 1. Status quo cartilaginous fish stocks and stock complex.

<b>Cartilaginous Fish Stocks</b>	<b>Cartilaginous Fish in the Other Fish Complex</b>
<b>Non-overfished Stocks</b> Longnose skate	Big skate California skate Leopard shark Ratfish Soupfin shark Spiny dogfish

### **Cartilaginous Alternative 1**

Two species were proposed for individual management by the GMT in June ([Agenda Item F.8.b, Supplemental GMT Report 2, June 2013](#)): longnose skate and spiny dogfish. Both species have large OFL contributions relative to the other cartilaginous species, as such these species might inflate the OFL of a complex that included them. Longnose skate and spiny dogfish have OFLs based on Category 1 stock assessments. In this alternative, the remaining species under consideration would be grouped into a (a) Shark and Ratfish Complex and a (b) Skate Complex. There are good reasons for separating the two complexes. The species do not co-occur to a high degree. And species are easily differentiable from one another. At the same time, the conservation need for separation may not be high. In general, cartilaginous species have life histories that are more similar to each other than to bony fishes, making their vulnerability to overfishing somewhat similar. The GMT notes that further research is required on the concept of indicator species for status determination but the SSC supports the possibility that longnose skate could be used as an indicator species for the skate complex (see [Agenda Item F.8.b, Supplemental SSC Report](#)).

Individual management - Coastwide

Longnose skate

Spiny dogfish

Shark and Ratfish Complex - Coastwide

Soupin shark

Brown cat shark

Leopard shark<sup>#</sup>

Spotted ratfish

<sup>#</sup> could be considered for state-management by California

Skate Complex - Coastwide

Aleutian skate

Big skate

Roughtail/black skate

California skate

All other skates

Bering/sandpaper skate

**Cartilaginous Fish Process for Developing Additional Alternatives**

*Step 1: Are there any species that the Council desires to add to or drop from the cartilaginous fish complex, or designate as EC species? See [Agenda Item G.8.b, Supplemental GMT Report 6](#).*

*Step 2: Which species in the Status Quo cartilaginous fishes (Table 1) may be vulnerable to overfishing. For this test, the GMT refers to coastwide catches and coastwide component OFLs/ABCs to assess biological risk of overfishing (see [Agenda Item G.8.b, Supplemental GMT Report 5](#), Appendix B, Table 8, Page 35). The ratio of catch to OFLs or catch to ABCs may suggest vulnerability to overfishing if the catch:OFL ratio exceeds 100 percent.*

Spiny dogfish shark:

Catches of spiny dogfish shark during the years 2004-2011 would not have exceeded the 2013 OFL (2,980 mt). Although the maximum catches during that period (2,455 mt and 2,464 mt in 2005 and 2006, respectively) were below the 2013 OFL, those levels of catches would have exceeded the 2013 ABC (2,044 mt) in 2005 (when catch was 2,455 mt) and in 2008 (when catch was 2,464 mt).

The GMT remains cautious for this species because the 2015 OFL and ABC may be lower than values shown in 2013. The GMT reviewed the SSC groundfish subcommittee report on the target spawning potential ratio (SPR) for west coast elasmobranch species ([Agenda Item G.7.b, SSC Groundfish Subcommittee Report, September 2013](#)). The new SPR of  $F_{SPR50\%}$  will produce a spiny dogfish OFL for 2015 of 2,523 mt, which is lower than the 2013 OFL (2,980 mt) shown in Appendix B (Table 8) that was calculated under the previous SPR of  $F_{SPR45\%}$ . Although maximum catches during 2004-2011 would not have exceeded that OFL, they approached it.

Under the new SPR, using the status quo p-star (P\*) of 0.30, the resulting 2015 ABC would be 1,731 mt. This ABC would have been exceeded during 3 of 8 years between 2004 and 2011. Note the most recent reported catch of spiny dogfish was 1,662 mt in 2010.

*Presumption:* The typical presumption is that for species with full assessments or species that may be at risk of overfishing, stocks may be best managed individually (i.e., out of the complex). However, there have been instances where the Council has chosen to keep species within the complex after weighing the tradeoffs between management practicality and concerns about individual species (e.g., black rockfish in CA and blackgill rockfish south of 40°10' N. latitude). In these instances, management measures, such as harvest guidelines and trip and bag limits, have been used to control catch. The Council should also weigh such factors when considering modifications to the Other Fish Complex.

The Council may decide to remove spiny dogfish from the complex for individual management if there is concern that catch will exceed the OFL. On the other hand, the Council may elect to retain spiny dogfish in one of the complexes shown in Status Quo or in the Cartilaginous Alternative 1. Management measures (e.g., trip limits, closed areas, and RCA adjustments) were analyzed to keep spiny dogfish below its ACL (See 2013-2014 FEIS).

*Considerations:*

- Coast-wide or North/South Management: All species within the Cartilaginous Fish Complex are managed coastwide.
- Co-occurrence: For the species shown under Status Quo, high co-occurrence was suggested between the following species: spiny dogfish-longnose skate, ratfish-longnose skate, ratfish-spiny dogfish, and leopard shark-big skate (see Appendix B in [Agenda Item G.8.b, GMT Report 5](#)). Although these data suggest high co-occurrence of spiny dogfish with longnose skate and ratfish, the GMT suggests that behavior and latitudinal differences are sufficiently different that co-occurrence would have a low implication to management if the decision was made to manage spiny dogfish separately.
- Similarity to Other Species: Spiny dogfish are easily identified ([Agenda Item G.8.b, GMT Report 3, September 2013](#)).
- Implications to buyers and fishermen: Concerns may include (a) additional bins needed for sorting the new market category, and b) potentially additional constraining species.
- Cost to the management system
- Allocations: 2-year allocations or development of a long-term allocation could be required between the trawl and non-trawl sectors and possibly within trawl.
- IFQ Quota Share: If trip limits and/or RCA adjustments are insufficient to keep catch within the trawl allocation, IFQ may need to be established. Determining the initial allocation at the permit level may be challenging, given the historical discard, therefore alternative allocations schemes may need to be explored.

*Step 3: Potential Inflator Stocks.* The GMT identified ratfish as an inflator species within the Status Quo Other Fish complex. The 2013 OFL for ratfish is 1,441 mt, whereas the next highest OFL in this complex is big skate (458 mt). If spiny dogfish is not removed because of potential risk of overfishing, the Council may also consider removing it from the Status Quo complex

because of its disproportionately large OFL contribution to the complex. Note, however, that if spiny dogfish is removed from this complex due to potential risk of overfishing (see above), the remaining species within the Cartilaginous Fish Complex are at low risk of overfishing ([Agenda Item G.8.b, Supplemental GMT Report 5](#), Appendix B, Table 8, Pg. 35). Hence, there may be no pending need to remove ratfish from this complex if spiny dogfish is managed separately. Potential inflator stocks in this complex may be:

- Ratfish
- Spiny dogfish shark

Implications and concerns with managing these stocks individually are similar to those shown at risk of overfishing species above.

## Cartilaginous Fishes

*Species to add to FMP, delete from FMP, or make EC species:*

- See Agenda Item G.8.b, GMT Supplemental Statement 6, September 2013 for a complete list of species.

*Select none to all of the following species for individual management that may be at risk of overfishing:*

- Spiny dogfish
- Other?

*Select none to all of the following species for individual management that may be considered inflator species:*

- Spotted ratfish
- Spiny dogfish
- Other?

*Or, for stocks that may be at risk of overfishing, or for stocks that may be considered inflator species, or for any other combinations, select none to all of the following if a new complex is desired:*

- Shark and ratfish complex
- Skate complex
- Other?

**Status Quo Roundfish Alternative**

The roundfish stocks in the FMP, including those managed in the status quo Other Fish complex, are depicted in Table 2.

Table 2. Status quo roundfish stocks and stock complexes.

Roundfish Stocks	Stock Complex
	Roundfish in the Other Fish Complex
<p><b>Non-overfished Stocks</b>            Cabezon (CA)            Cabezon (OR)            California scorpionfish            Lingcod N and S of 40°10'            Pacific cod            Pacific whiting            Sablefish N and S of 36° N. latitude</p>	<p>Cabezon (WA)            Finescale codling            Kelp greenling            Pacific grenadier</p>

**Other Roundfish Alternative 1**

The Other Roundfish Alternative 1 complex would be managed using coastwide ABCs. Consistent with the Status Quo, California scorpionfish and cabezon in Oregon and California are removed from the complexes and managed separately. The GMT recommends that they continue to be managed individually since they are targeted stocks where catch is currently tracked individually. The remaining roundfish were divided into the Deepwater Roundfish Complex and the Shallow Roundfish Complex due to their disparate depth distributions. The species contained in the Shallow Roundfish Complex (kelp greenling, other greenlings, and cabezon (WA)) are also managed under state fishery regulations.

*Individual Management*

California scorpionfish  
 Cabezon (Oregon and California, as in status quo)

*Deepwater Roundfish Complex*

Pacific rattail/grenadier  
 Giant rattail/grenadier  
 All other rattails/grenadiers  
 Finescale codling/Pacific flatnose (Consider making this an EC species)  
 California slickhead (Consider making this an EC species)

*Shallow Roundfish Complex (consider individual management)*

Kelp Greenling  
 All other greenlings  
 Cabezon (Washington only)

## **Other Roundfish Process for Developing Additional Alternatives**

*Step 1: Are there any species that the Council desires to add to or drop from the other roundfish, or designate as EC species? See [Agenda Item G.8.b, Supplemental GMT Report 6, September 2013](#).*

*Step 2: Which species in the roundfish complex (Table 2) may be vulnerable to overfishing. None of the coastwide catches exceeded coastwide component OFLs/ABCs providing no indication of a biological risk of overfishing (see [Agenda Item G.8.b, Supplemental GMT Report 5, Appendix B, Table 9, page 36](#)).*

*Presumption:* The typical presumption is that for species with full assessments (i.e., California scorpionfish, cabezon in Oregon and California) may be best managed individually (i.e., out of the complex). However, there have been instances where the Council has chosen to keep species within the complex after weighing the tradeoffs between management practicality and concerns about individual species. In these instances, management measures, such as harvest guidelines and trip and bag limits, have been used to control catch. The Council should also weigh such factors when considering modifications to this complex.

### *Considerations:*

- Co-occurrence: Pacific grenadier, giant grenadier and California slickhead were all found to have especially high co-occurrence values and were moderate co-occurrence with Pacific flatnose ([Agenda Item G.8.b, Supplemental GMT Report 5, Appendix A, Table 4, page 19](#)). This suggests that low implication of managing the deeper other roundfish separately. The Shallow Other Roundfish did not display strong co-occurrence in the WCGOP data used in the analysis though their depth distribution would imply that they occupy the same depth distribution.
- Similarity to Other Species: Each of the grenadier are similar to one another as are the greenlings, though experienced samplers and fishermen may be able to easily discriminate them.
- Implications to buyers and fishermen: a) additional bins needed for sorting the new market category of Shallow Roundfish and Deeper Roundfish.
- Cost to the management system
- The effects of adding an additional market category and strata on the reliability of the estimates
- Pacific flatnose and California slickhead are being considered for addition to the FMP. These species are candidates for EC species.
- No OFL contributions are available for Pacific flatnose, California slickhead, Cabezon (Washington), giant rattail/grenadier, all other rattails/grenadiers or all other greenlings, which means that catch accrues against the contribution of other component stock OFLs. Thus Pacific grenadier is providing the entire OFL for the deeper other roundfish, while kelp greenling provides the entire OFL for the shallow roundfish. This should be born in mind while considering addressing complex overages inseason or during specifications.

*Step 3: Potential Inflator Stocks.* The GMT identified two stocks that may be considered “inflator stocks” within the other roundfish complex (see Appendix B):

Pacific rattail/grenadier

Kelp greenling

**Other Roundfish**

*Species to add to FMP, delete from FMP, or make EC species:*

- See Agenda Item G.8.b, GMT Supplemental Statement 6, September 2013 for a complete list of species.

*Select none to all of the following species for individual management that may be at risk of overfishing:*

- None
- Other?

*Select none to all of the following species for individual management that may be considered inflator species:*

- Pacific rattail/grenadier
- Kelp greenling
- Other?

*Or, for stocks that may be at risk of overfishing, or for stocks that may be considered inflator species, or for any other combinations, select none to all of the following if a new complex is desired:*

- Pacific rattail/grenadier-giant rattail/grenadier-other rattails/grenadiers
- Other?

## Flatfish Alternatives

The status quo flatfish complex and an additional Alternative 1 is provided in this section for flatfish. In addition, results of our process that may be used to create additional alternatives are provided. The Council may use the results of this process, along with information provided in Status Quo, to create additional alternatives that better fit within Council objectives.

**Table 3: Status Quo Flatfish Alternative**

<b>Flatfish stocks (coastwide)</b>	<b>Flatfish Stock Complex (coastwide)</b>
<b>Overfished Stocks</b>	Butter sole
Petrale sole	Curlfin sole
<b>Non-overfished Stocks</b>	Flathead sole
English sole	Pacific sanddab
Dover sole	Rex sole
Arrowtooth flounder	Rock sole
Starry flounder	Sand sole
	Slender Sole
	Deep Sea Sole

### **Flatfish Stock Complex Alternative 1 (coastwide)**

Flatfish Alternative 1 complex would be managed using coastwide ABCs under this alternative. Further, under Alternative 1, several species are removed from the complexes and managed separately (Pacific sanddab and Rex sole) due to the fact that these two species are substantial inflator species, contributing to 91 percent of the complex OFL.

Table 4: Flatfish Stock Complex Alternative 1

<b>Flatfish stocks (coastwide)</b>	<b>Flatfish Stock Complex (coastwide)</b>
<b>Overfished Stocks</b>	Butter sole
Petrale sole	Curlfin sole
<b>Non-overfished Stocks</b>	Flathead sole
English sole	Rock sole
Dover sole	Sand sole
Arrowtooth flounder	Slender Sole
Starry flounder	Deep Sea Sole
<i>Pacific sanddab</i>	
<i>Rex sole</i>	

**Other Flatfish Complex Process for Developing Additional Alternatives**

*Step 1: Are there any species that the Council desires to add to or drop from the other flatfish, complex or designate as EC species? See [Agenda Item G.8.b, Supplemental GMT Report 6, September 2013](#).*

*Step 2: Which species in the current other flatfish complex (see Status Quo) may be vulnerable to overfishing? For this test, the GMT refers to coastwide catches and coastwide component OFLs/ABCs to assess biological risk of overfishing (see [Agenda Item G.8.b, Supplemental GMT Report 6, September 2013, Appendix B](#)). The PSA scores were not used for this evaluation, because catch relative to OFL is a more reliable indicator for species with OFLs. The ratio of catch to OFLs or catch to ABCs may suggest vulnerability to overfishing if the catch:OFL ratio exceeds 100 percent. However, none of the species in the remaining flatfish stock complex have exceeded their OFL contribution since 2007.*

Two species remaining in the flatfish stock complex under Alternative 1 have exceeded their average ABC contributions between 2004 through 2011, curlfin and flathead sole (186 percent and 124 percent of their ABC contributions, respectively).

Curlfin sole: Average coastwide catches relative to 2013 component OFLs/ABCs that curlfin sole exceeded its ABC/OFL contribution during certain years prior to 2007 ([Agenda Item G.8.b, Supplemental GMT Report 6, September 2013](#), Appendix B). Using 2013 component OFLs from a data poor assessment (8.2 mt), the ratio of 2004-2011 average catches to the 2013 component OFL is 130 percent. However, average catches were lower during the 2009-2011 period (43

percent of its component OFL) than during the 2004-2011 period. The distribution of curlfin sole is well distributed north and south of 40° 10' N. latitude, and rarely encountered outside of 100 fm (Appendix A). Given that curlfin sole have not exceeded its OFL contribution since 2007, managing them within a coastwide flatfish sole complex may be sufficient to control catch (with substantial inflator species, Pacific sanddabs and rex sole removed for single species management).

Flathead sole: Coastwide catches relative to 2013 component OFLs/ABCs suggest that flathead sole may have been at slight risk of overfishing during certain years prior to 2006 ([Agenda Item G.8.b, Supplemental GMT Report 6, September 2013](#), Appendix B). Using 2013 component OFLs from a data poor assessment (35 mt), the ratio of 2004-2011 average catches to the 2013 component OFL is 86 percent (124 percent of its component ABC). However, average catches were lower during the 2009-2011 (20 percent of its component OFL, 29 percent of its component ABC) period than during the 2004-2011 period. The distribution of flathead sole is mostly distributed north of 40° 10' N. latitude, although some catch is encountered south of 40° 10' N. latitude. Furthermore, catch is typically inside of 300 fm, with highest concentrations inside of 200 fm ([Agenda Item G.8.b, Supplemental GMT Report 5](#), Appendix A). Given that flathead sole have not exceeded its OFL contribution since 2006, managing them within a coastwide flatfish sole complex may be sufficient to control catch (with Pacific sanddabs and rex sole, substantial inflator species removed for single species management).

*Presumption:* The Council may decide to remove both species historically at potential risk to overfishing from the complex for individual management, although given that catch has remained well within ABC/OFL contributions in recent years, catch of these species may be easily managed and tracked by removing the substantial inflator species.

*Step 3: Potential Inflator Stocks.* The Council may consider removing potential inflator stocks from the complexes and managing separately. The GMT generally agreed with discussion presented with the Preliminary Alternatives ([Agenda Item F.8.a, Attachment 1, June 2013](#)) regarding potential impacts of inflator stocks to other species within a complex. In other words, the presence of inflator stocks in a complex can increase the risk of overfishing other stocks in the complex since it inflates the complex OFL. The GMT identified three stocks that may be considered “inflator stocks” within the Other Flatfish complex (see [Agenda Item G.8.b, Supplemental GMT Report 6, September 2013](#), Appendix B):

- Pacific sanddab
- Rex sole
- Sand sole

As mentioned above, 91 percent of the status quo flatfish complex OFL is from Pacific sanddab and Rex sole. Furthermore, 98 percent of the status quo flatfish complex OFL is from Pacific sanddab, Rex sole, and Sand sole. Therefore, the Council may find merit in an additional flatfish stock complex Alternative 2 with Pacific sanddab, Rex sole, and sand sole pulled from the complex for single species management.

*Considerations:*

- Implications to buyers and fishermen: Due to market considerations, Pacific sanddab and Rex sole are already frequently separated. Therefore, disruption to fishing vessel and processor operations are not expected by separating these species for single species management.

**Other Flatfish**

*Species to add to FMP, delete from FMP, or make EC species:*

- See Agenda Item G.8.b, GMT Supplemental Statement 6, September 2013 for a complete list of species.

*Select none to all of the following species for individual management that may be at risk of overfishing:*

- Curlfin sole
- Flathead sole
- Other?

*Select none to all of the following species for individual management that may be considered inflator species:*

- Pacific sanddab
- Rex sole
- Sand sole
- Other?

*Or, for stocks that may be at risk of overfishing, or for stocks that may be considered inflator species, or for any other combinations, select none to all of the following if a new complex is desired:*

- Curlfin-flathead
- Butter-curlfin-flathead-rock soles
- Other?