# 1.0 Environmental Consequences of the Alternatives

## 1.1 Biological Impacts

### 1.1.1 Modification to the Uncertainty Buffer

#### 1.1.1.1 Option 1: No Action

The No Action alternative would maintain the 25% uncertainty buffer, and therefore the TALs, as established in Framework 5 (NEFMC, 2018). This would not affect the ability of the bait and wing fisheries to fully achieve their existing TALs. Therefore, fishing effort would not be expected to be lower than the levels analyzed in Framework 5 (NEFMC, 2018), which increased the TALs and had a low negative biological impact on the skate complex.

In relation to Options 2 and 3, Option 1 would have a positive biological impact because it would not increase the TALs and therefore fishing effort would not be expected to increase.

#### 1.1.1.2 Option 2: Reduction in the Uncertainty Buffer to 20%

Option 2 would reduce the uncertainty buffer set in Framework 5 (NEFMC, 2018) from 25% to 20%. This would not adjust the Acceptable Biological Catch (ABC), however, it would increase the TAL. This option would allow for some increased fishing pressure to occur, which could have low negative impacts as more skates would be harvested.

The buffer functions as a proactive measure to reduce the likelihood of the ABC/ACL from being exceeded. The NE Skate Complex is a data poor stock, which has failed to be modeled by traditional stock assessment models. Biological reference points are currently set based on changes in biomass proxies, which are derived from the Northeast Fisheries Science Center trawl survey. The ABC calculation is based on the survey indices and the median catch/biomass ratio. This was considered risk-averse and captures the scientific uncertainty in the catch/biomass relationship.

Landings and discards have not been generally reported by species and therefore species specific landings and discards must be estimated using length composition from trawl survey data and applying it to the length composition of each portion of the catch. This method allows for landings (on paper) of prohibited species and there is currently no way to change this. Species specific catch has been required by the FMP since 2003 but a large portion of landings continue to be reported as unclassified. Framework 3 (NEFMC, 2016) removed the unclassified VTR codes for the skate wing and bait fisheries in an effort to improve species specific reporting.

Section 6.1.4 discusses the assumed discard mortality rate that was established in Amendment 3 (NEFMC, 2010) and subsequent research that has improved the data incorporated into specifications for some species. The magnitude of discards, and fluctuations in the estimates, represents another source of uncertainty. Skates are encountered in a range of fisheries and gear types and a large portion of biomass is set aside to account for projected dead discards. However, in some recent years, catch has exceeded the ACT (Table 25), which highlighted the usefulness of the buffer. Table 5 provides total skate discards by gear type between years 1964 – 2016. Discard estimates can fluctuate by year, which is difficult to account for when a hindcast of discards is used to calculate the proportion of dead discards for future fishing years.

**Table 1 – ACLs from FYs 2011 – 2016 and percent of ACL achieved**

| Fishing Year | ACL | Percent of ACL |
|---|---|---|
| 2011 | 50,435 | 64% |
| 2012 | 50,435 | 56% |
| 2013 | 50,435 | 55.8 |
| 2014 | 35,479 | 81.2 |
| 2015 | 35,479 | 79.2 |
| 2016 | 31,081 | 79 |

#### 1.1.1.3 Option 3: Reduction in the Uncertainty Buffer to 15%

Option 3 would reduce the uncertainty buffer set in Framework 5 (NEFMC, 2018) from 25% to 15%. This would not adjust the Acceptable Biological Catch (ABC), however, it would increase the TAL. This option would allow for some increased fishing pressure to occur, which could have low negative impacts as more skates would be harvested.

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Landings and discards have not been generally reported by species and therefore must be estimated using length composition of the survey applied to the length composition of each portion of the catch. This method allows for landings of prohibited species and there is currently no way to change this. Species specific catch has been required by the FMP since 2003 but a large portion of landings continue to be reported as unclassified. Framework 3 (NEFMC, 2016) removed the unclassified VTR codes for the skate wing and bait fisheries in an effort to improve species specific reporting.

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#### 1.1.1.4 Option 4: Reduction in the Uncertainty Buffer to 10%

Option 4 would reduce the uncertainty buffer set in Framework 5 (NEFMC, 2018) from 25% to 10%. This would not adjust the Acceptable Biological Catch (ABC), however, it would increase the TAL. This option would allow for some increased fishing pressure to occur, which could have low negative impacts as more skates would be harvested.

The buffer functions as a proactive measure to reduce the likelihood of the ABC/ACL from being exceeded. The NE Skate Complex is a data poor stock, which has failed to be modeled by traditional

stock assessment models. Biological reference points are currently set based on changes in biomass proxies, which are derived from the Northeast Fisheries Science Center trawl survey. The ABC calculation is based on the survey indices and the median catch/biomass ratio. This was considered risk-averse and captures the scientific uncertainty in the catch/biomass relationship.

Landings and discards have not been generally reported by species and therefore must be estimated using length composition of the survey applied to the length composition of each portion of the catch. This method allows for landings of prohibited species and there is currently no way to change this. Species specific catch has been required by the FMP since 2003 but a large portion of landings continue to be reported as unclassified. Framework 3 (NEFMC, 2016) removed the unclassified VTR codes for the skate wing and bait fisheries in an effort to improve species specific reporting.

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### 1.1.2 Skate Wing Possession Limit Alternatives

#### 1.1.2.1 Option 1: No Action

#### 1.1.2.2 Option 2: Intermediate Skate Wing Possession Limit

## 1.2 Biological Impact on non-target species and other discarded species

### 1.2.1 Modification to the Uncertainty Buffer

The skate wing fishery is largely an incidental fishery prosecuted during fishing under other FMPs as described in Section 3.3. Of just over 23,000 trips landing skate wings, approximately 1,000 trips landed the full skate wing possession limit in Season 1 and 200 trips in Season 2, however, these trips landed a higher portion of the TAL than the incidental trips. Catch of non-skate species on trips landing skates are controlled by the DAS limits, sector rules, or other discard limiting measures in other FMPs. For information regarding recent limits in other fisheries, please refer to the discussion of cumulative effects (Section 7.7). On the small portion of trips where skates are directly targeted, common non-target species include monkfish and spiny dogfish. The increase in the TALs resulting from lowering the uncertainty buffer would not be expected to significantly increase catch of non-target species. These alternatives would have a low negative impact on non-target species because they would increase the TAL and therefore potential interactions with other species.

Vessels that target skates in lieu of other fish while on a DAS are likely to catch and possibly discard low amounts of other species. Because these discards are controlled by measures in other fisheries, the impacts to non-skate species from the uncertainty buffer alternatives are negligible above those already

analyzed for actions in the other FMPs. The increase in the TAL may allow the skate fisheries to be prosecuted throughout the entire fishing year and therefore would minimize the likelihood of effort shifting from skates to another target species if the incidental possession limit was put into effect, making a trip unprofitable.

### 1.2.2 Skate Wing Possession Limit Alternatives

# 1.3 Essential Fish Habitat (EFH) Impacts

## 1.3.1 Modification to the Uncertainty Buffer

### 1.3.1.1 Option 1: No Action

The No Action alternative would maintain the 25% uncertainty buffer, and therefore the TALs, as established in Framework 5 (NEFMC, 2018). This would not affect the ability of the bait and wing fisheries to fully achieve their existing TALs. Therefore, fishing effort would not be expected to be lower than the levels analyzed in Framework 5 (NEFMC, 2018), which increased the TALs and had minor negative EFH impacts.

EFH impacts are related to the amount and location of fishing effort, and the gear type used. Skates are caught using both gillnets and bottom trawls. Gillnets have a much smaller footprint overall than otter trawls because they are a fixed gear, and the quality of the per unit area impact is also lower (Stevenson *et al*. 2004, NEFMC 2011[1]). In addition, EFH for northeast skate species was determined to have a low vulnerability to sink gillnet gear (Stevenson *et al*. 2004). Combining these two findings, the gillnet component of the skate fishery is not causing adverse effects to EFH. Bottom otter trawls, on the other hand, have a relatively large area swept footprint and also a larger per unit area impact (Stevenson et al. 2004, NEFMC 2011). Bottom trawl per unit area impact aggregated over this larger footprint causes adverse effects to EFH. Because the skate fishery is largely an incidental fishery, measures that affect fishing effort in fisheries such as NE multispecies and monkfish may influence EFH impacts attributed to the skate fishery.

Option 1 would produce minor negative impacts to the EFH resource because no significant change in fishing effort or interactions with EFH would be expected. Option 1 may have similar low negative impacts on EFH compared to Options 2, 3, and 4.

### 1.3.1.2 Option 2: Reduction in Uncertainty Buffer to 20%

Option 2 would reduce the uncertainty buffer from 25% to 20%. The TAL would increase compared to the TAL established in Framework 5 (NEFMC, 2018). This would not improve the ability of the bait and wing fisheries to fully achieve their TALs, but would increase the amount they could land and slightly prolong the fishing year. Fishing effort would be expected to be slightly higher than Option 1and would be expected to have minor negative EFH impacts.

EFH impacts are related to the amount and location of fishing effort, and the gear type used. Skates are caught using both gillnets and bottom trawls. Gillnets have a much smaller footprint overall than otter trawls because they are a fixed gear, and the quality of the per unit area impact is also lower (Stevenson *et al*. 2004, NEFMC 2011[2]). In addition, EFH for northeast skate species was determined to have a low vulnerability to sink gillnet gear (Stevenson *et al*. 2004). Combining these two findings, the gillnet component of the skate fishery is not causing adverse effects to EFH. Bottom otter trawls, on the other hand, have a relatively large area swept footprint and also a larger per unit area impact (Stevenson et al. 2004, NEFMC 2011). Bottom trawl per unit area impact aggregated over this larger footprint causes

[1] New England Fishery Management Council (2011). The Swept Area Seabed Impact (SASI) approach: a tool for analyzing the effects of fishing on Essential Fish Habitat. 257pp. Available online at www.nefmc.org/library/omnibus-habitat-amendment-2.
[2] New England Fishery Management Council (2011). The Swept Area Seabed Impact (SASI) approach: a tool for analyzing the effects of fishing on Essential Fish Habitat. 257pp. Available online at www.nefmc.org/library/omnibus-habitat-amendment-2.

adverse effects to EFH. Because the skate fishery is largely an incidental fishery, measures that affect fishing effort in fisheries such as NE multispecies and monkfish may influence EFH impacts attributed to the skate fishery.

Option 2 would produce minor negative impacts to the EFH resource because no significant change in fishing effort or interactions with EFH would be expected. Option 2 may have similar low negative impacts on EFH compared to Options 1, 3, and 4.

#### 1.3.1.3 Option 3: Reduction in Uncertainty Buffer to 15%

Option 3 would reduce the uncertainty buffer from 25% to 15%. The TAL would increase compared to the TAL established in Framework 5 (NEFMC, 2018). This would not improve the ability of the bait and wing fisheries to fully achieve their TALs, but would increase the amount they could land and slightly prolong the fishing year. Fishing effort would be expected to be slightly higher than Option 1and would be expected to have minor negative EFH impacts.

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Option 3 would produce minor negative impacts to the EFH resource because no significant change in fishing effort or interactions with EFH would be expected. Option 3 may have similar low negative impacts on EFH compared to Options 1,2, and 4.

#### 1.3.1.4 Option 4: Reduction in the Uncertainty Buffer to 10%

Option 4 would reduce the uncertainty buffer from 25% to 10%. The TAL would increase compared to the TAL established in Framework 5 (NEFMC, 2018). This would not improve the ability of the bait and wing fisheries to fully achieve their TALs, but would increase the amount they could land and slightly prolong the fishing year. Fishing effort would be expected to be slightly higher than Option 1and would be expected to have minor negative EFH impacts.

EFH impacts are related to the amount and location of fishing effort, and the gear type used. Skates are caught using both gillnets and bottom trawls. Gillnets have a much smaller footprint overall than otter trawls because they are a fixed gear, and the quality of the per unit area impact is also lower (Stevenson *et al*. 2004, NEFMC 2011[4]). In addition, EFH for northeast skate species was determined to have a low

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[4] New England Fishery Management Council (2011). The Swept Area Seabed Impact (SASI) approach: a tool for analyzing the effects of fishing on Essential Fish Habitat. 257pp. Available online at www.nefmc.org/library/omnibus-habitat-amendment-2.

vulnerability to sink gillnet gear (Stevenson *et al*. 2004). Combining these two findings, the gillnet component of the skate fishery is not causing adverse effects to EFH. Bottom otter trawls, on the other hand, have a relatively large area swept footprint and also a larger per unit area impact (Stevenson et al. 2004, NEFMC 2011). Bottom trawl per unit area impact aggregated over this larger footprint causes adverse effects to EFH. Because the skate fishery is largely an incidental fishery, measures that affect fishing effort in fisheries such as NE multispecies and monkfish may influence EFH impacts attributed to the skate fishery.

Option 4 would produce minor negative impacts to the EFH resource because no significant change in fishing effort or interactions with EFH would be expected. Option 4 may have similar low negative impacts on EFH compared to Options 1, 2, and 3.

### 1.3.2 Skate Wing Possession Limit Alternatives

#### 1.3.2.1 Option 1: No Action

#### 1.3.2.2 Option 2: Intermediate Skate Wing Possession Limit

## 1.4 Impacts on Endangered and Other Protected Species (ESA, MMPA)

The protected resources that may be impacted by interactions with fishing gear used to catch skates are identified in Section 6.2.

### 1.4.1 Modification to the Uncertainty Buffer

#### 1.4.1.1 Option 1: No Action

The No Action alternative would maintain the 25% uncertainty buffer and the TALs as those established in Framework 5 (NEFMC, 2018). As a result, fishing behavior would remain similar to current operating conditions (e.g., no spatial or temporal shifts in effort; no changes in gear type, quantity, or relative soak/tow time). The skate fisheries are allowed to fish year-round for skate wings and bait, restrictions on fishing throughout the fishing year result from either fishery being projected to exceed its seasonal or annual TAL resulting in the incidental possession limit being implemented. It is difficult to predict when an incidental possession limit will be implemented and its effect on fishing behavior but previous implementation periods have been for relatively short time periods, e.g. 6 weeks in FY2016. Once the incidental possession limit was removed, fishing behavior will resume, with no expected changes in effort relative to current operating conditions, as was seen in FY2016 when fishing resumed after the effective closure at a pace that achieved both TALs. However, the incidental possession limit was implemented approximately 4.5 months before the end of the 2017 fishing year and is not expected to be lifted until the next fishing year. Once 100% of the bait annual TAL is achieved, the bait fishery is closed.

Significant changes in effort (e.g., gear quantity, soak/tow time, area fished), even if a closure occurs, are not expected under Option 1. As a result, fishing behavior is expected to remain similar to current operating conditions. Understanding expected fishing behavior/effort in a fishery informs potential interaction risks with protected species. Specifically, interaction risks with protected species are strongly associated with amount, time, and location of gear in the water; vulnerability of an interaction increases with increases, relative to respective fisheries current operating conditions, of any or all of these factors. Taking into consideration the latter, as well as fishing behavior/effort under the No Action (Option 1), impacts of the No Action to protected species are provided below:

*MMPA (Non-ESA listed) Protected Species Impacts*

Impacts of the No Action on non-ESA listed marine mammals (i.e., species of cetaceans and pinnipeds) are somewhat uncertain as quantitative analysis has not been performed. However, we have considered, to the best of our ability, the most recent (2010-2014) information on non-ESA listed marine mammal interactions with commercial fisheries, of which, the skate fishery is a component (Hayes *et al*. 2017). Aside from pilot whales and several stocks of bottlenose dolphin, there has been no indication that takes of non-ESA listed species of marine mammals in commercial fisheries has gone above and beyond levels which would result in the inability of each species population to sustain itself (Hayes *et al*. 2017). Specifically, aside from pilot whales and several stocks of bottlenose dolphin, potential biological removal (PBR) has not been exceeded for any of the non-ESA listed marine mammal species identified in section 6.4 (Hayes *et al*. 2017). Although pilot whales and several stocks of bottlenose dolphin have experienced levels of take that have resulted in the exceedance of each species PBR, take reduction strategies and/or plans have been implemented to reduce bycatch in the fisheries affecting these species (Atlantic Trawl Gear Take Reduction Strategy, Pelagic Longline Take Reduction Plan effective May 19, 2009 (74 FR 23349); Bottlenose Dolphin Take Reduction Plan (BDTRP), effective April 26, 2006 (71 FR 24776)). These efforts are still in place and are continuing to assist in decreasing bycatch levels for these

species. Although the most recent five years of information presented in Hayes et al. (2017) is a collective representation of commercial fisheries interactions with non-ESA listed species of marine mammals, and does not address the effects of the skate fishery specifically, the information does demonstrate that thus far, operation of the skate fishery, or any other fishery, has not resulted in a collective level of take that threatens the continued existence of non-ESA listed marine mammal populations.

Based on the above information, and the fact that the skate fishery must comply with specific take reduction plans (i.e., HPTRP, BDTRP); and that voluntary measures exist that reduce serious injury and mortality to marine mammal species incidentally caught in trawl fisheries (see the Atlantic Trawl Gear Take Reduction Team), but occasional fishery interactions still occur, the No Action is expected to have low negative to neutral impacts on non-ESA listed species of marine mammal. Relative to Options 2 and 3, Option 1, which has a lower total allowable landing, may result in slightly less negative impacts to non-ESA listed species of marine mammals as lower allocations may result in increases in fishing effort, which may equate to increased interactions with these marine mammal species.

*ESA Listed Species*

The skate fishery is prosecuted with sink gillnet and bottom trawl gear. As provided in section 6.2, ESA listed species of whales, sea turtles, Atlantic sturgeon, and Atlantic salmon are vulnerable to interactions with this gear type, with interactions often resulting in serious injury or mortality to the species. Based on this, the skate fishery is likely to result in some level some level of negative impacts to ESA listed species. Taking into consideration fishing behavior/effort under the No Action alternative, as well as the fact that interaction risks with protected species are strongly associated with amount, time, and location of gear in the water (with vulnerability of an interaction increasing with increases in of any or all of these factors), we determined the level of negative impacts to ESA listed species to be low. Below, we provide support for this determination.

As provided above, the No Action alternative will maintain the existing specifications including the total allowable landings for both fisheries. As a result, fishing behavior and effort in the skate fishery is expected to remain similar to what has been observed in the fishery over the last 5 or more years. Specifically, the number of bottom trawls or sink gillnets, tow or soak times, and area fished are not expected change significantly from current operating conditions. As noted above, interactions risks with protected species are strongly associated with amount, time, and location of gear in the water. Continuation of "status quo" fishing behavior/effort is not expected to change any of these operating conditions and therefore, the impacts of the No Action alternative on ESA listed species is expected to be low negative. However, as provided above, should incidental possession limits be implemented for either fishery, as they have in the past under similar operating conditions as the No Action, some benefit to listed species may be experienced. As any resultant implementation in the fishery will result in reduced fishing in the wing fishery, we can conclude that there will be some reduction in the amount of gear being present in the water for a specific period of time. Once 100% of the bait annual TAL is achieved, the bait fishery is closed. As provided above, interaction risks with protected species are strongly associated with amount, time, and location of gear in the water, with vulnerability of an interaction increasing with increases of any or all of these factors. Based on this information, any implementation of the incidental possession has the potential to reduce interaction risks with listed species, thereby providing some benefit to listed species. However, the magnitude of this reduction in interactions is dependent on the period of time the incidental possession limit is in place.

*Overall Impacts to Protected Species*

Based on the above protected species impact analysis, overall impacts of Option 1 on protected species (ESA listed and MMPA protected) are expected to be low negative. Relative to Options 2, 3, and 4, Option 1 may result in neutral to low positive impacts to protected species because lower allocations may result in decreased fishing effort, which may equate to decreased interactions with protected species.

### 1.4.1.2 Option 2: Reduction in Uncertainty buffer to 20%

Option 2 would revise the uncertainty buffer and increase the TAL for the skate complex for the 2018-2019 fishing years. The increase in the TALs may result in more directed fishing effort. However, a small component of the skate fishery targets skates. A large number of trips only land incidental amounts of wings and are likely targeting non-skate species (Figure 12). Since the possession of skates mostly requires vessels to be fishing on a NE Multispecies, Scallop, or Monkfish DAS, fishing effort on skates are also largely constrained by regulations set by other FMPs. Catch of non-skate species on trips landing skates are controlled by the DAS limits, sector rules, or other discard limiting measures in other FMPs. Fishing effort would be restricted by the revised specifications, but also by regulations restricting fishing for non-skate species, and the associated AMs that account for any overage of ACLs. Based on the above, and the fact that the increase in TAL is moderately small, Option 2 is expected to result in little to no incentive to increase fishing effort on skate, especially as it may allow additional discards to be converted to landings.

Based on this information, impacts to protected species are not expected to be much greater than those under Option 1 (see Section 1.1.1.1). The small increase in total allowable landings may allow for discards to be converted to landings, while potentially not increasing overall effort. However, should the small increase in TAL result in some slight increase in fishing effort, this potentially equates to slightly more fishing time, and therefore, gear being present in the water for a longer duration. As protected species (ESA listed and MMPA species) interactions with gear is greatly influenced by the amount of gear, and the duration of time gear is in the water, any increase in either of these factors will increase the potential for protected species interactions with gear and therefore, increase the potential for serious injury or mortality to these species. As a result, Option 2 may have some negative impacts on protected species. Taking this into consideration, Option 2 is likely to have low negative to negative impacts on protected species relative.

Relative to Option 1, Option 2 is likely to have neutral to negative impacts on protected species as there is the potential, albeit small, that fishing effort could increase under Option 2, resulting in the potential for protected species interactions to increase. Relative to Options 3 and 4, Option 2 could have neutral impacts on protected species as the potential changes in effort, and thus interaction risks to protected species, are expected to be similar across all Options.

### 1.4.1.3 Option 3: Reduction in Uncertainty buffer to 15%

Option 3 would revise the uncertainty buffer and increase the TAL for the skate complex for the 2018-2019 fishing years. The increase in the TALs may result in more directed fishing effort. However, a small component of the skate fishery targets skates. A large number of trips only land incidental amounts of wings and are likely targeting non-skate species (Figure 12). Since the possession of skates mostly requires vessels to be fishing on a NE Multispecies, Scallop, or Monkfish DAS, fishing effort on skates are also largely constrained by regulations set by other FMPs. Catch of non-skate species on trips landing skates are controlled by the DAS limits, sector rules, or other discard limiting measures in other FMPs. Fishing effort would be restricted by the revised specifications, but also by regulations restricting fishing for non-skate species, and the associated AMs that account for any overage of ACLs. Based on the above, and the fact that the increase in TAL is moderately small, Option 3 is expected to result in little to no

incentive to increase fishing effort on skate, especially as it may allow additional discards to be converted to landings.

Based on this information, impacts to protected species are not expected to be much greater than those under Option 1 (see Section 1.1.1.1). The small increase in total allowable landings may allow for discards to be converted to landings, while potentially not increasing overall effort. However, should the small increase in TAL result in some slight increase in fishing effort, this potentially equates to slightly more fishing time, and therefore, gear being present in the water for a longer duration. As protected species (ESA listed and MMPA species) interactions with gear is greatly influenced by the amount of gear, and the duration of time gear is in the water, any increase in either of these factors will increase the potential for protected species interactions with gear and therefore, increase the potential for serious injury or mortality to these species. As a result, Option 3 may have some negative impacts on protected species. Taking this into consideration, Option 3 is likely to have low negative to negative impacts on protected species relative.

Relative to Option 1, Option 3 is likely to have neutral to negative impacts on protected species as there is the potential, albeit small, that fishing effort could increase under Option 3, resulting in the potential for protected species interactions to increase. Relative to Options 2 and 4, Option 3 could have neutral impacts on protected species as the potential changes in effort, and thus interaction risks to protected species, are expected to be similar across all Options.

#### 1.4.1.4 Option 4: Reduction in Uncertainty buffer to 10%

Option 4 would revise the uncertainty buffer and increase the TAL for the skate complex for the 2018-2019 fishing years. The increase in the TALs may result in more directed fishing effort. However, a small component of the skate fishery targets skates. A large number of trips only land incidental amounts of wings and are likely targeting non-skate species (Figure 12). Since the possession of skates mostly requires vessels to be fishing on a NE Multispecies, Scallop, or Monkfish DAS, fishing effort on skates are also largely constrained by regulations set by other FMPs. Catch of non-skate species on trips landing skates are controlled by the DAS limits, sector rules, or other discard limiting measures in other FMPs. Fishing effort would be restricted by the revised specifications, but also by regulations restricting fishing for non-skate species, and the associated AMs that account for any overage of ACLs. Based on the above, and the fact that the increase in TAL is moderately small, Option 4 is expected to result in little to no incentive to increase fishing effort on skate, especially as it may allow additional discards to be converted to landings.

Based on this information, impacts to protected species are not expected to be much greater than those under Option 1 (see Section 1.1.1.1). The small increase in total allowable landings may allow for discards to be converted to landings, while potentially not increasing overall effort. However, should the small increase in TAL result in some slight increase in fishing effort, this potentially equates to slightly more fishing time, and therefore, gear being present in the water for a longer duration. As protected species (ESA listed and MMPA species) interactions with gear is greatly influenced by the amount of gear, and the duration of time gear is in the water, any increase in either of these factors will increase the potential for protected species interactions with gear and therefore, increase the potential for serious injury or mortality to these species. As a result, Option 4 may have some negative impacts on protected species. Taking this into consideration, Option 4 is likely to have low negative to negative impacts on protected species relative.

Relative to Option 1, Option 4 is likely to have neutral to negative impacts on protected species as there is the potential, albeit small, that fishing effort could increase under Option 4, resulting in the potential for

protected species interactions to increase. Relative to Options 2 and 3, Option 4 could have neutral impacts on protected species as the potential changes in effort, and thus interaction risks to protected species, are expected to be similar across all Options.