Appendix 1a. Evaluation of California skate based on MLMA Master Plan bycatch criteria.

Category and question	**Response**	**Comments**
A. Legality of take		
A1. Under what laws, regulations, or guidance documents is the species covered?	Fish and Game Code, Federal Code of Regulations	The possession of skate wings on any boat is prohibited as there are no equivalents or conversion factors established in statute or regulation under which other than whole skates may be brought ashore (Fish & G. Code, §§5508, 8042). Section 8597.b(3) skates under 18 inches may be taken or possessed under marine aquaria collector permit. California Code of Regulations, Title 14, section 27.60 28.49(a); general bag limit of 10. Federal groundfish seasonal closures.
A2. Are there prohibitions against take using specific gear type?	No	
A3. Is the species a target species that requires discard of individuals based on size limits, seasons, or gear type restrictions?	No	
A4. Is the discard mortality rate known?	Unknown	Unknown for trawl; however, CDFW observers documented 0.3% instantaneous mortality during the 2022–2023 CHTG assessment.
A5a. Are special permits required to retain or interact with the species?	No	Open access quotas allow limited take, but generally all are released.
A5b. If yes, does the fishery currently have such permits?	Not applicable	
A5c. If yes, do the levels of bycatch comply with them?	Not applicable	

Category and question	Response	Comments
A6a. Does the species have an incidental catch allowance, ACL, or other restrictions on the amount, size, or sex of catch allowed?	No	Classified as an Ecosystem Component Species by the PFMC (20022b) Groundfish Management Plan (GMP), is not targeted, is not subject to overfishing or being overfished in the absence of conservation measures and not generally retained for sale or personal use (PFMC 2022b).
A6b. If yes, does the catch comply with them?	Not applicable	
B. Threats to sustainability		
B1. Has a peer-reviewed risk assessment of the vulnerability of the particular bycatch species to overfishing been conducted (e.g., PSA)	Yes	A vulnerability score of 2.12 indicates relatively high concern (Status of the Pacific Coast Groundfish Fishery 2022b).
B2a. Does a population status estimate or stock assessment exist for this species?	No	
B2b. If yes, is there confidence in the underlying data such that a reasonable determination can be made if the stock is considered healthy, overfished, or depleted?	Not applicable	

Category and question	Response	Comments
B3a. Are there any existing state and/or federal management measures?	Yes	Possession of skate wings on any boat is prohibited as there are no equivalents or conversion factors established in statute or regulation under which other than whole skates may be brought ashore (Fish & G. Code, §§5508, 8042). Section 8597.b(3) skates under 18 inches may be taken or possessed under marine aquaria collector permit. California Code of Regulations, Title 14, sections 27.60 and 28.49(a); general bag limit of 10. Federal groundfish seasonal closures.
B3b. If yes, are they effective in ensuring sustainability?	Not applicable	
B4. Is the bycatch the product of recreational catch-and-release practices?	No	
B5. What is the estimated discard mortality rate given the characteristics of the fishery and gear type?	Unknown	Unknown for trawl; however, CDFW observers documented 0.3% instantaneous mortality during the 2022–2023 CHTG assessment.
B6. Do any post-release studies exist to verify the estimated mortality rate?	No	
B7. What is the probability of mortality exceeding levels that have been scientifically determined to be necessary for the continued viability of the species?	Unknown	
C. Impacts on fisheries		

Category and question	Response	Comments
C1. Does a directed fishery exist for the bycatch species?	No	
C2. Has the bycatch and associated discard mortality been accounted for?	No	
C3. Is bycatch affecting the directed fishery management strategy (i.e., restrictions on size, sex, or season)?	No	
C4. Are the impacts of bycatch considered and made explicit in an ESR or FMP?	No	
C5a. Is the species constrained under a federal rebuilding plan?	No	
C5b. If yes, will bycatch compete with fleets that target the species?	Not applicable	
C6. Is there a management allowance for percent of catch or a prohibition on retention?	No	There is no federal harvest guideline for retention.
C7. If there is a directed fishery for the species, have there been any of the following?	Not applicable	

Category and question	Response	Comments
C7a. Reductions in opportunities or income for participants in fisheries that target the bycatch species	Not applicable	
C7b. Reductions in fishery quotas or opportunities (e.g., time and area closures) based on bycatch issues?	Not applicable	
C7c. Early closures of a fishery based on higher-than-expected bycatch?	Not applicable	
C7d. Changes in fishing, processing, disposal, and marketing costs due to bycatch?	Not applicable	
C7e. Changes in the social or cultural value of fishing activities due to bycatch?	Not applicable	
C7f. Negative socioeconomic impacts from bycatch on fisheries and/or fishing communities which target or need incidental catch of this species?	Not applicable	
C7g. Negative impacts to juveniles of a species targeted by another fishery?	Not applicable	

Category and question	Response	Comments
D. Impacts on ecosystem		
D1. What is the ecosystem role of the bycatch species?		California skates are mesopredators; they eat primarily crustaceans and fishes.
D2. Does scientific evidence show the amount of bycatch mortality significantly increases the risk that a bycatch species will be unable to serve its ecosystem role?	No	
References		Status of the Pacific Coast Groundfish Fishery Stock Assessment and Fishery Evaluation September 2020, Pacific Fishery Management Council. 2022b. Status-of-the-Pacific-coast-groundfish-fishery-stock-assessment-and-fishery-evaluation. Pacific Fishery Management Council, Portland, OR, USA.

Appendix 1b. Evaluation of slender crab based on MLMA Master Plan bycatch criteria.

Category and question	Response	Comments
A. Legality of take	-	-
A1. Under what laws, regulations, or guidance documents is species covered?	Fish and Game Code; California Code of Regulations, Title 14	Fish and Game Code, section 8834 max weight of crab to be take w/trawl is 500 lbs; Recreational under California Code of Regulations Title 14, section 29.85(c). Same bag and carapace limitations as rock crabs.
A2. Are there prohibitions against take using specific gear type?	No	Take is recreationally legal using same gear as other crabs (crab trap, hoop net, snares, or by hand)
A3. Is the species a target species that requires discard of individuals based on size limits, seasons, or gear type restrictions?	No	There is a minimum carapace length of 10.16 cm (4 in) and a sport bag limit of 35.
A4. Is the discard mortality rate known?	Unknown	Unknown for trawl; however, CDFW observers documented 4.8% instantaneous mortality during the 2022–2023 CHTG assessment.
A5a. Are special permits required to retain or interact with the species?	No	
A5b. If yes, does the fishery currently have such permits?	Not applicable	
A5c. If yes, do the levels of bycatch comply with them?	Not applicable	
A6a. Does the species have an incidental catch allowance, ACL, or other restrictions on the amount, size, or sex of catch allowed?	Not applicable	The slender crab typically not a target species because maximum species size (11.43 cm) is smaller than other Cancridae crabs.
A6b. If yes, does the catch comply with them?	Not applicable	

Category and question	Response	Comments
B. Threats to sustainability		
B1. Has a peer-reviewed risk assessment of the vulnerability of the particular bycatch species to overfishing been conducted (e.g., PSA)	Not assessed	
B2a. Does a population status estimate or stock assessment exist for this species?	No	
B2b. If yes, is there confidence in the underlying data such that a reasonable determination can be made if the stock is considered healthy, overfished, or depleted?	Not applicable	
B3a. Are there any existing state and/or federal management measures?	Yes	Slender crab have a minimum required carapace length of 10.16 cm.
B3b. If yes, are they effective in ensuring sustainability?	Not applicable	Slender crab typically do not get large enough to meet the minimum length.
B4. Is the bycatch the product of recreational catch-and-release practices?	No	
B5. What is the estimated discard mortality rate given the characteristics of the fishery and gear type?	Unknown	Unknown for trawl; however, CHTG observers documented a 4.8% instantaneous mortality during the 2022–2023 CHTG assessment.

Category and question	Response	Comments
B6. Do any post-release studies exist to verify the estimated mortality rate?	No	
B7. What is the probability of mortality exceeding levels that have been scientifically determined to be necessary for the continued viability of the species?	Unknown	
C. Impacts on fisheries		
C1. Does a directed fishery exist for the bycatch species?	No	
C2. Has the bycatch and associated discard mortality been accounted for?	No	
C3. Is bycatch affecting the directed fishery management strategy (i.e., restrictions on size, sex, or season)?	No	
C4. Are the impacts of bycatch considered and made explicit in an ESR or FMP?	No	
C5a. Is the species constrained under a federal rebuilding plan?	No	
C5b. If yes, will bycatch compete with fleets that target the species?	Not applicable	

Category and question	Response	Comments
C6. Is there a management allowance for percent of catch or a prohibition on retention?	No	
C7. If there is a directed fishery for the species, have there been any of the following?	Not applicable	
C7a. Reductions in opportunities or income for participants in fisheries that target the bycatch species	Not applicable	
C7b. Reductions in fishery quotas or opportunities (e.g., time and area closures) based on bycatch issues?	Not applicable	
C7c. Early closures of a fishery based on higher-than-expected bycatch?	Not applicable	
C7d. Changes in fishing, processing, disposal, and marketing costs due to bycatch?	Not applicable	
C7e. Changes in the social or cultural value of fishing activities due to bycatch?	Not applicable	

Category and question	Response	Comments
C7f. Negative socioeconomic impacts from bycatch on fisheries and/or fishing communities which target or need incidental catch of this species?	Not applicable	
C7g. Negative impacts to juveniles of a species targeted by another fishery?	Not applicable	
D. Impacts on ecosystem		
D1. What is the ecosystem role of the bycatch species?	Slender crabs are macropredators. They eat primarily crustaceans and fishes.	
D2. Does scientific evidence show the amount of bycatch mortality significantly increases the risk that a bycatch species will be unable to serve its ecosystem role?	No	
References	Add specific references you used other than the general ones listed in Question A1.	California Department of Fish and Wildlife (CDFW). 2022. Slender crab *Metacarcinus gracilis*, Marine Species Portal. California Department of Fish and Wildlife, Sacramento, CA, USA.

Appendix 1c. Evaluation of longspine combfish based on MLMA Master Plan bycatch criteria.

Category and question	**Response**	**Comments**
A. Legality of take		
A1. Under what laws, regulations, or guidance documents is species covered?	Fish and Game Code; California Code of Regulations, Title 14, section 27.60	There is a default recreational 10 fish limit.
A2. Are there prohibitions against take using specific gear type?	No	
A3. Is the species a target species that requires discard of individuals based on size limits, seasons, or gear type restrictions?	No	There is no directed fishery for longspine combfish.
A4. Is the discard mortality rate known?	Unknown.	Unknown for trawl; however, CDFW observers documented 54.8% instantaneous mortality during the 2022–2023 CHTG assessment.
A5a. Are special permits required to retain or interact with the species?	No	
A5b. If yes, does the fishery currently have such permits?	Not applicable	
A5c. If yes, do the levels of bycatch comply with them?	Not applicable	
A6a. Does the species have an incidental catch allowance, ACL, or other restrictions on	Not applicable	

Category and question	Response	Comments
the amount, size, or sex of catch allowed?		
A6b. If yes, does the catch comply with them?	Not applicable	
B. Threats to sustainability		
B1. Has a peer-reviewed risk assessment of the vulnerability of the particular bycatch species to overfishing been conducted (e.g., PSA)	Not assessed	This species is not evaluated under the International Union for Conservation and Nature (IUCN).
B2a. Does a population status estimate or stock assessment exist for this species?	No	
B2b. If yes, is there confidence in the underlying data such that a reasonable determination can be made if the stock is considered healthy, overfished, or depleted?	Not applicable	
B3a. Are there any existing state and/or federal management measures?	Yes.	State recreational default bag limit of 10.
B3b. If yes, are they effective in ensuring sustainability?	Not applicable	Not targeted or retained by recreational or commercial.
B4. Is the bycatch the product of recreational catch-and-release practices?	No	

Category and question	Response	Comments
B5. What is the estimated discard mortality rate given the characteristics of the fishery and gear type?	Unknown	Unknown for trawl; however, CDFW observers documented a 54.8% instantaneous mortality for the 2022–2023 CHTG assessment.
B6. Do any post-release studies exist to verify the estimated mortality rate?	No	
B7. What is the probability of mortality exceeding levels that have been scientifically determined to be necessary for the continued viability of the species?	Unknown	
C. Impacts on fisheries		
C1. Does a directed fishery exist for the bycatch species?	No	
C2. Has the bycatch and associated discard mortality been accounted for?	No	
C3. Is bycatch affecting the directed fishery management strategy (i.e., restrictions on size, sex, or season)?	No	
C4. Are the impacts of bycatch considered and made explicit in an ESR or FMP?	No	
C5a. Is the species constrained under a federal rebuilding plan?	No	

Category and question	Response	Comments
C5b. If yes, will bycatch compete with fleets that target the species?	Not applicable	
C6. Is there a management allowance for percent of catch or a prohibition on retention?	No	
C7. If there is a directed fishery for the species, have there been any of the following?	Not applicable	
C7a. Reductions in opportunities or income for participants in fisheries that target the bycatch species	Not applicable	
C7b. Reductions in fishery quotas or opportunities (e.g., time and area closures) based on bycatch issues?	Not applicable	
C7c. Early closures of a fishery based on higher-than-expected bycatch?	Not applicable	
C7d. Changes in fishing, processing, disposal, and marketing costs due to bycatch?	Not applicable	
C7e. Changes in the social or cultural value of fishing activities due to bycatch?	Not applicable	

Category and question	Response	Comments
C7f. Negative socioeconomic impacts from bycatch on fisheries and/or fishing communities which target or need incidental catch of this species?	Not applicable	
C7g. Negative impacts to juveniles of a species targeted by another fishery?	Not applicable	
D. Impacts on ecosystem		
D1. What is the ecosystem role of the bycatch species?		The longspine combfish is a predator of benthic invertebrates and basal prey item for larger fishes.
D2. Does scientific evidence show the amount of bycatch mortality significantly increases the risk that a bycatch species will be unable to serve its ecosystem role?	Unknown	
References	Add specific references you used other than the general ones listed in Question A1.	Froese, R., and D. Pauly, editors. 2025.FishBase. World Wide Web electronic publication. Available from: www.fishbase.org (Accessed Nov 2025)

Appendix 1d. Evaluation of Pacific angel shark based on MLMA Master Plan bycatch criteria.

Category and question	**Response**	**Comments**
A. Legality of take		
A1. Under what laws, regulations, or guidance documents is species covered?	Fish and Game Code	A commercial minimum size limit established in 1986 was created to ensure that sharks had a chance to reproduce at least once before being retained in the catch. Fish and Game Code, section 8388(a) states "No female angel shark measuring less than 106.7 cm (42 in) in total length or 38.7 cm (15 ¼ in) in alternate length and no male angel shark measuring less than 101.6 cm (40 in) in total length or 36.8 cm (14 ½ in) in alternate length may be possessed, sold, or purchased, except that 10 percent of the angel sharks in any load may measure not more than 1.3 cm (½ in) less than the minimum size specified herein." There is a restricted access fishery for set gill nets (Fish & G. Code, §§ 8610, 8680, 8681, and 8682).
A2. Are there prohibitions against take using specific gear type?	Yes	The set gill net fishery requires the use of a minimum mesh size and a maximum net length. Inside the CHTG, required cod-end mesh is 19.1 cm (7.5 in), outside the CHTG in federal waters, the minimum mesh is 11.4 cm (4.5 in).
A3. Is the species a target species that requires discard of individuals based on size limits, seasons, or gear type restrictions?	Yes	There is a minimum size limit which requires discard of undersize fish. See A1.
A4. Is the discard mortality rate known?	Unknown	Unknown for trawl; however, CDFW observers documented 0.0% instantaneous mortality during the 2022–2023 CHTG assessment.
A5a. Are special permits required to retain or interact with the species?	No	

Category and question	Response	Comments
A5b. If yes, does the fishery currently have such permits?	Not applicable	
A5c. If yes, do the levels of bycatch comply with them?	Not applicable	
A6a. Does the species have an incidental catch allowance, ACL, or other restrictions on the amount, size, or sex of catch allowed?	Yes	There is a minimum legal size; see A1.
A6b. If yes, does the catch comply with them?	Yes	Fishermen may not legally land undersize fish.
B. Threats to sustainability		
B1. Has a peer-reviewed risk assessment of the vulnerability of the particular bycatch species to overfishing been conducted (e.g., PSA)	Yes	CDFW PSA completed in 2019 indicated Pacific angel shark ranked first in vulnerability among 36 fish and invertebrate species analyzed.
B2a. Does a population status estimate or stock assessment exist for this species?	No, but Pacific angel shark is listed on IUCN Red List of Threatened Species	The species is listed as "Near threatened" on the IUCN Red List of Threatened Species in 2014. This category is between "Least concern" and "Vulnerable". Source: https://www.iucnredlist.org/species/39328/177163701

Category and question	Response	Comments
B2b. If yes, is there confidence in the underlying data such that a reasonable determination can be made if the stock is considered healthy, overfished, or depleted?	Not applicable	Pacific angel shark are largely protected from fishing pressure. Therefore, it is presumed that the population remains stable in California (CDFW 2019).
B3a. Are there any existing state and/or federal management measures?	Yes	Commercial set gill net and trawl fishing is allowed in their primary inshore sandy-bottom habitat. There is a minimum length requirement for retention.
B3b. If yes, are they effective in ensuring sustainability?	Yes	The Pacific angel shark is largely protected from fishing pressure. Therefore, it is presumed that the population remains relatively stable in California (CDFW 2019).
B4. Is the bycatch the product of recreational catch-and-release practices?	No	Recreational anglers do not target this species.
B5. What is the estimated discard mortality rate given the characteristics of the fishery and gear type?	Unknown	Unknown for trawl gear. CDFW observers documented 0% release mortality during the 2022–2023 CHTG assessment.
B6. Do any post-release studies exist to verify the estimated mortality rate?	No	There have been no post-release studies for this species.

Category and question	Response	Comments
B7. What is the probability of mortality exceeding levels that have been scientifically determined to be necessary for the continued viability of the species?	Unknown	The Pacific angel shark is largely protected from fishing pressure. Therefore, it is presumed that the population remains stable in California (CDFW 2019).
C. Impacts on fisheries		
C1. Does a directed fishery exist for the bycatch species?	Yes	It is taken as an incidentally caught species in the halibut set gill net fishery and halibut trawl fishery.
C2. Has the bycatch and associated discard mortality been accounted for?	No	Discard mortality unknown. CDFW observers documented 0% instantaneous mortality during the 2022–2023 CHTG assessment.
C3. Is bycatch affecting the directed fishery management strategy (i.e., restrictions on size, sex, or season)?	No	The bycatch of Pacific angel shark is incidental catch since this is a desirable and marketable species.
C4. Are the impacts of bycatch considered and made explicit in an ESR or FMP?	Yes	This is discussed in the Pacific angel shark ESR (CDFW 2019).

Category and question	Response	Comments
C5a. Is the species constrained under a federal rebuilding plan?	No	This is not a federally managed species.
C5b. If yes, will bycatch compete with fleets that target the species?	Not applicable	-
C6. Is there a management allowance for percent of catch or a prohibition on retention?	Yes	There is a prohibition on landing fish below the minimum legal size.
C7. If there is a directed fishery for the species, have there been any of the following?		
C7a. Reductions in opportunities or income for participants in fisheries that target the bycatch species	Yes	A ban on set gill netting in state waters and north of Point Conception, and closure of primary processing plant for angel sharks, led to a significant decline in catch and effort in the 1990s.
C7b. Reductions in fishery quotas or opportunities (e.g., time and area closures) based on bycatch issues?	No	There is no quota for this species.

Category and question	Response	Comments
C7c. Early closures of a fishery based on higher-than-expected bycatch?	No	There are no early closures based on the amount of bycatch.
C7d. Changes in fishing, processing, disposal, and marketing costs due to bycatch?	No	There have been no changes for which CDFW is aware.
C7e. Changes in the social or cultural value of fishing activities due to bycatch?	No	There have been no changes for which CDFW is aware.
C7f. Negative socioeconomic impacts from bycatch on fisheries and/or fishing communities which target or need incidental catch of this species?	Yes	A ban on set gill netting in state waters and north of Point Conception, and closure of primary processing plant for angel sharks, led to a significant decline in catch and effort in the 1990s.
C7g. Negative impacts to juveniles of a species targeted by another fishery?	No	A minimum size limit offers protection to juveniles.
D. Impacts on ecosystem		

Category and question	Response	Comments
D1. What is the ecosystem role of the bycatch species?		"As apex predators, sharks play an important role in regulating trophic interactions. In California, Pacific angel shark prey on common reef fish, and thus probably exert some top-down regulation on the distribution and abundance of lower trophic level fishes and invertebrates in inshore food webs (Pittenger 1984, cited in ESR [CDFW 2020])."
D2. Does scientific evidence show the amount of bycatch mortality significantly increases the risk that a bycatch species will be unable to serve its ecosystem role?	No	"There are no formal overfishing threshold criteria for Pacific angel shark. However, landings are tracked in both the commercial and recreational sectors, and, given the low landings that have occurred since the ban on set gill net and trammel nets in the early 1990s, there are currently no concerns about overfishing occurring on this stock." (CDFW 2020)
References		Pittenger, G. G. 1984. Movements, distribution, feeding, and growth of the Pacific angel shark, *Squatina californica*, at Catalina Island, California. Thesis, California State University, Long Beach, CA, USA. California Department of Fish and Wildlife (CDFW). 2019. Pacific Angel Shark, *Squatina californica*, Enhanced Status Report. California Department of Fish and Wildlife, Sacramento, CA, USA. California Department of Fish and Wildlife (CDFW). 2020. Pacific Angel Shark, *Squatina californica*, Enhanced Status Report. California Department of Fish and Wildlife, Sacramento, CA, USA. Fishbase.org

Appendix 1e. Evaluation of hornyhead turbot based on MLMA Master Plan bycatch criteria.

Category and question	Response	Comments
A. Legality of take	Fish and Game Code; California Code of Regulations, Title 14, section 27.60	There is a default recreational 10 fish limit.
A1. Under what laws, regulations, or guidance documents is species covered?	No	
A2. Are there prohibitions against take using specific gear type?	No	There is no directed fishery for hornyhead turbot.
A3. Is the species a target species that requires discard of individuals based on size limits, seasons, or gear type restrictions?	No.	Unknown for trawl. CDFW observers documented 2.3% instantaneous mortality during the 2022–2023 CHTG assessment.
A4. Is the discard mortality rate known?	No	
A5a. Are special permits required to retain or interact with the species?	Not applicable	
A5b. If yes, does the fishery currently have such permits?	Not applicable	
A5c. If yes, do the levels of bycatch comply with them?	No	

Category and question	Response	Comments
A6a. Does the species have an incidental catch allowance, ACL, or other restrictions on the amount, size, or sex of catch allowed?	Not applicable	
A6b. If yes, does the catch comply with them?		
B. Threats to sustainability	No	No PSA has been done, but the species is listed as least concern by IUCN.
B1. Has a peer-reviewed risk assessment of the vulnerability of the particular bycatch species to overfishing been conducted (e.g., PSA)	No	
B2a. Does a population status estimate or stock assessment exist for this species?	Not applicable	
B2b. If yes, is there confidence in the underlying data such that a reasonable determination can be made if the stock is considered healthy, overfished, or depleted?	Yes	Per California Code of Regulations, Title 14, section 27.60, there is a default recreational 10 fish limit. Generally, not commercially retained.

Category and question	Response	Comments
B3a. Are there any existing state and/or federal management measures?	Unknown	Hornyhead turbot are not encountered by the recreational fishery or commercially retained.
B3b. If yes, are they effective in ensuring sustainability?	No	
B4. Is the bycatch the product of recreational catch-and-release practices?	Unknown	Unknown for trawl. CDFW observers documented 2.3% instantaneous mortality during the 2022–2023 CHTG assessment.
B5. What is the estimated discard mortality rate given the characteristics of the fishery and gear type?	No	
B6. Do any post-release studies exist to verify the estimated mortality rate?	Unknown	
B7. What is the probability of mortality exceeding levels that have been scientifically determined to be necessary for the continued viability of the species?		
C. Impacts on fisheries	No	Hornyhead turbot are taken incidentally in the halibut trawl and gill net fisheries.
C1. Does a directed fishery exist for the bycatch species?	No	

Category and question	Response	Comments
C2. Has the bycatch and associated discard mortality been accounted for?	No	
C3. Is bycatch affecting the directed fishery management strategy (i.e., restrictions on size, sex, or season)?	No	There is no ESR or FMP for hornyhead turbot.
C4. Are the impacts of bycatch considered and made explicit in an ESR or FMP?	No	
C5a. Is the species constrained under a federal rebuilding plan?	Not applicable	
C5b. If yes, will bycatch compete with fleets that target the species?	No	
C6. Is there a management allowance for percent of catch or a prohibition on retention?	Not applicable	
C7. If there is a directed fishery for the species, have there been any of the following?	Not applicable	

Category and question	Response	Comments
C7a. Reductions in opportunities or income for participants in fisheries that target the bycatch species	Not applicable	
C7b. Reductions in fishery quotas or opportunities (e.g., time and area closures) based on bycatch issues?	Not applicable	
C7c. Early closures of a fishery based on higher-than-expected bycatch?	Not applicable	
C7d. Changes in fishing, processing, disposal, and marketing costs due to bycatch?	Not applicable	
C7e. Changes in the social or cultural value of fishing activities due to bycatch?	Not applicable	

Category and question	Response	Comments
C7f. Negative socioeconomic impacts from bycatch on fisheries and/or fishing communities which target or need incidental catch of this species?	Not applicable	
C7g. Negative impacts to juveniles of a species targeted by another fishery?	Not applicable	
D. Impacts on ecosystem		The hornyhead turbot is a predator of benthic invertebrates.
D1. What is the ecosystem role of the bycatch species?	None available	
D2. Does scientific evidence show the amount of bycatch mortality significantly increases the risk that a bycatch species will be unable to serve its ecosystem role?	Add specific references you used other than the general ones listed in Question A1.	
References		Froese, R., and D. Pauly, editors. 2025. FishBase. World Wide Web electronic publication. Available from: www.fishbase.org (Accessed Nov 2025)

Appendix 1f. Evaluation of sheep crab based on MLMA Master Plan bycatch criteria.

Category and question	**Response**	**Comments**
A. Legality of take		
A1. Under what laws, regulations, or guidance documents is species covered?	Fish and Game Code, California Code of Regulations, Title 14	Fish and Game Code, section 8598.2 legal for take with Marine aquaria permit; Fish and Game Code, section 8284(a) - any fish can be retained in crab traps used to take Dungeness crab (Fish & G. Code, §§ 9011 and 8284(c)(3)) - Districts 19 and 118.5 in rock crab traps; Fish and Game Code, section 8250 (b)(1) - legal in lobster traps; California Code of Regulations, Title 14, section 26(b)(3) legal for take in trap gear.
A2. Are there prohibitions against take using specific gear type?	No	
A3. Is the species a target species that requires discard of individuals based on size limits, seasons, or gear type restrictions?	No	
A4. Is the discard mortality rate known?	Unknown	Unknown for trawl. CDFW observers documented 2.6% instantaneous mortality during the 2022–2023 CHTG assessment.
A5a. Are special permits required to retain or interact with the species?	No	
A5b. If yes, does the fishery currently have such permits?	Not applicable	
A5c. If yes, do the levels of bycatch comply with them?	Not applicable	

Category and question	Response	Comments
A6a. Does the species have an incidental catch allowance, ACL, or other restrictions on the amount, size, or sex of catch allowed?	Yes	Per California Code of Regulations, Title 14, section 126(b)(3), 95,000 lb are allowed for take statewide in a calendar year.
A6b. If yes, does the catch comply with them?	Yes	52,000 lb were landed in 2022.
B. Threats to sustainability		
B1. Has a peer-reviewed risk assessment of the vulnerability of the particular bycatch species to overfishing been conducted (e.g., PSA)	Not assessed	
B2a. Does a population status estimate or stock assessment exist for this species?	Not assessed	
B2b. If yes, is there confidence in the underlying data such that a reasonable determination can be made if the stock is considered healthy, overfished, or depleted?	Not applicable	

Category and question	Response	Comments
B3a. Are there any existing state and/or federal management measures?	Yes	Per Fish and Game Code, section 8598.2, sheep crab are legal for take with Marine aquaria permit; Per California Code of Regulations, Title 14, section 126(b)(3), sheep crab are legal for take in trap gear.
B3b. If yes, are they effective in ensuring sustainability?	unknown	Take of sheep crab is relatively low.
B4. Is the bycatch the product of recreational catch-and-release practices?	No	
B5. What is the estimated discard mortality rate given the characteristics of the fishery and gear type?	Unknown	Unknown for trawl. CDFW observers documented 2.6% instantaneous mortality during the 2022–2023 CHTG assessment.
B6. Do any post-release studies exist to verify the estimated mortality rate?	No	
B7. What is the probability of mortality exceeding levels that have been scientifically determined to be necessary for the continued viability of the species?	Unknown	
C. Impacts on fisheries		
C1. Does a directed fishery exist for the bycatch species?	No	Sheep crab are taken incidentally in halibut trawl and gill net fisheries.

Category and question	Response	Comments
C2. Has the bycatch and associated discard mortality been accounted for?	No	
C3. Is bycatch affecting the directed fishery management strategy (i.e., restrictions on size, sex, or season)?	No	
C4. Are the impacts of bycatch considered and made explicit in an ESR or FMP?	No	There is no ESR or FMP for sheep crab.
C5a. Is the species constrained under a federal rebuilding plan?	No	
C5b. If yes, will bycatch compete with fleets that target the species?	Not applicable	
C6. Is there a management allowance for percent of catch or a prohibition on retention?	No	
C7. If there is a directed fishery for the species, have there been any of the following?	Not applicable	

Category and question	Response	Comments
C7a. Reductions in opportunities or income for participants in fisheries that target the bycatch species	Not applicable	
C7b. Reductions in fishery quotas or opportunities (e.g., time and area closures) based on bycatch issues?	Not applicable	
C7c. Early closures of a fishery based on higher-than-expected bycatch?	Not applicable	
C7d. Changes in fishing, processing, disposal, and marketing costs due to bycatch?	Not applicable	
C7e. Changes in the social or cultural value of fishing activities due to bycatch?	Not applicable	
C7f. Negative socioeconomic impacts from bycatch on fisheries and/or fishing communities which target or need incidental catch of this species?	Not applicable	
C7g. Negative impacts to juveniles of a species targeted by another fishery?	Not applicable	

Category and question	Response	Comments
D. Impacts on ecosystem		
D1. What is the ecosystem role of the bycatch species?		The sheep crab is a scavenger and predator of benthic invertebrates.
D2. Does scientific evidence show the amount of bycatch mortality significantly increases the risk that a bycatch species will be unable to serve its ecosystem role?	None available	
References	Add specific references you used other than the general ones listed in Question A1.	California Department of Fish and Wildlife (CDFW). 2024. Sheep crab *Loxorhynchus grandis*, Marine Species Portal. California Department of Fish and Wildlife, Sacramento, CA, USA.

Appendix 12. Evaluation of yellow rock crab based on MLMA Master Plan bycatch criteria.

Category and question	**Response**	**Comments**
A. Legality of take		
A1. Under what laws, regulations, or guidance documents is species covered?	Fish and Game Code, California Code of Regulations, Title 14	Per Fish and Game Code, section 8598.2, yellow rock crab are legal for take with Marine aquaria permit; Section 8284(a) - any fish can be retained in crab traps used to take Dungeness crab; Sections 9011 and 8284(c)(3) - Districts 19 and 118.5 in rock crab traps; Section 8250 (b)(1) - legal in lobster traps; Per Title 14, section 126(b)(3), yellow rock crab are legal for take in trap gear; Per Fish and Game Code, section 8834, the maximum weight of crab to be take with trawl is 500 lbs; 125(a) - permit required to take rock crab with traps; Sections 8282 and 125.1 - minimum size of 11.4 cm (4.25 in).
A2. Are there prohibitions against take using specific gear type?	Yes	Recreational fishing using traps is prohibited south of Point Arguello; there ae limits to amount of recreational hoop net gear south of Point Arguello; Commercial trap fishing permit is open-access north of Lopez Point, limited-entry south of Lopez Point.
A3. Is the species a target species that requires discard of individuals based on size limits, seasons, or gear type restrictions?	Yes	Yes, there is a minimum size limit of 11.4 cm (4.5 in) commercial, 10.2 cm (4 in) recreational (sublegal crab must be discarded).
A4. Is the discard mortality rate known?	Unknown	Unknown for trawl. CDFW observers documented 0.0% instantaneous mortality during the 2022–2023 CHTG assessment.
A5a. Are special permits required to retain or interact with the species?	No	
A5b. If yes, does the fishery currently have such permits?	Not applicable	

Category and question	Response	Comments
A5c. If yes, do the levels of bycatch comply with them?	Not applicable	
A6a. Does the species have an incidental catch allowance, ACL, or other restrictions on the amount, size, or sex of catch allowed?	Yes	Yellow rock crab has a minimum legal carapace length of 11.43 cm.
A6b. If yes, does the catch comply with them?	Yes	
B. Threats to sustainability		
B1. Has a peer-reviewed risk assessment of the vulnerability of the particular bycatch species to overfishing been conducted (e.g., PSA)	Not assessed	
B2a. Does a population status estimate or stock assessment exist for this species?	Not assessed	

Category and question	Response	Comments
B2b. If yes, is there confidence in the underlying data such that a reasonable determination can be made if the stock is considered healthy, overfished, or depleted?	Not applicable	
B3a. Are there any existing state and/or federal management measures?	Yes	Yellow rock crab has a minimum legal carapace measurement of 11.43 cm; take is permitted in commercial trap fisheries, and there is a recreational bag limit of 35.
B3b. If yes, are they effective in ensuring sustainability?	Unknown	Yes, the sport limit has been 35 for many decades.
B4. Is the bycatch the product of recreational catch-and-release practices?	No	
B5. What is the estimated discard mortality rate given the characteristics of the fishery and gear type?	Unknown	Unknown for trawl. CDFW observers documented 0.0% instantaneous mortality during the 2022–2023 CHTG assessment.
B6. Do any post-release studies exist to verify the estimated mortality rate?	No	

Category and question	Response	Comments
B7. What is the probability of mortality exceeding levels that have been scientifically determined to be necessary for the continued viability of the species?	Unknown	
C. Impacts on fisheries		
C1. Does a directed fishery exist for the bycatch species?	Yes	There are northern and southern California rock crab trap fisheries. The species is also taken incidentally to Dungeness crab in the recreational fishery.
C2. Has the bycatch and associated discard mortality been accounted for?	No	
C3. Is bycatch affecting the directed fishery management strategy (i.e., restrictions on size, sex, or season)?	No	
C4. Are the impacts of bycatch considered and made explicit in an ESR or FMP?	No	Yes, as related to the trap fishery. Other gear types are not considered.
C5a. Is the species constrained under a federal rebuilding plan?	No	

Category and question	Response	Comments
C5b. If yes, will bycatch compete with fleets that target the species?	Not applicable	
C6. Is there a management allowance for percent of catch or a prohibition on retention?	No	
C7. If there is a directed fishery for the species, have there been any of the following?	Not applicable	
C7a. Reductions in opportunities or income for participants in fisheries that target the bycatch species	No	
C7b. Reductions in fishery quotas or opportunities (e.g., time and area closures) based on bycatch issues?	No	
C7c. Early closures of a fishery based on higher-than-expected bycatch?	No	
C7d. Changes in fishing, processing, disposal, and marketing costs due to bycatch?	No	

Category and question	Response	Comments
C7e. Changes in the social or cultural value of fishing activities due to bycatch?	No	
C7f. Negative socioeconomic impacts from bycatch on fisheries and/or fishing communities which target or need incidental catch of this species?	None	
C7g. Negative impacts to juveniles of a species targeted by another fishery?	None	Most trawl-caught yellow rock crabs are released live. CDFW's 2022–2023 CHTG assessment saw 0% yellow rock crab instantaneous mortality.
D. Impacts on ecosystem		
D1. What is the ecosystem role of the bycatch species?		The yellow rock crab is a scavenger and predator of benthic inverts.
D2. Does scientific evidence show the amount of bycatch mortality significantly increases the risk that a bycatch species will be unable to serve its ecosystem role?	None available	

Category and question	Response	Comments
References	Add specific references you used other than the general ones listed in Question A1.	California Department of Fish and Wildlife (CDFW). 2021. Red, Yellow, and Brown Rock Crab, *Cancer productus*, *Metacarcinus anthonyi*, and *Romaleon antennarium*, Enhanced Status Report. California Department of Fish and Wildlife, Sacramento, CA, USA.

Appendix 1h. Evaluation of sublegal halibut based on MLMA Master Plan bycatch criteria.

Category and question	**Response**	**Comments**
A. Legality of take		
A1. Under what laws, regulations, or guidance documents is species covered?	Fish and Game Code; California Code of Regulations, Title 14; Title 50 Federal Code of Regulations	Per Fish and Game Code, sections 8494–97: within the California Halibut Trawl Grounds, a trawl permit required; per Fish and Game Code, section 8392, there is a minimum length requirement with a tail sweep allowed.
		Per California Code of Regulations, Title 14, section 124: light touch trawl gear is required in trawl grounds, section 124.1: requires halibut trawl permit renewal;
		Per Federal Code of Regulations, Title 50, section 660.333: participation in halibut trawl fishery defined.
A2. Are there prohibitions against take using specific gear type?	Yes	Sublegal-sized halibut are not allowed for retention with any gear.
A3. Is the species a target species that requires discard of individuals based on size limits, seasons, or gear type restrictions?	Yes	There is a minimum legal length of 55.9 cm (22 in).
A4. Is the discard mortality rate known?	Unknown	Unknown for trawl. CDFW observers documented 16.8% instantaneous mortality during the 2022–2023 CHTG assessment.
A5a. Are special permits required to retain or interact with the species?	No	
A5b. If yes, does the fishery currently have such permits?	Not applicable	
A5c. If yes, do the levels of bycatch comply with them?	Not applicable	

Category and question	Response	Comments
A6a. Does the species have an incidental catch allowance, ACL, or other restrictions on the amount, size, or sex of catch allowed?	Yes	There is a minimum legal length for retention regardless of gear type.
A6b. If yes, does the catch comply with them?	Yes	
B. Threats to sustainability		
B1. Has a peer-reviewed risk assessment of the vulnerability of the particular bycatch species to overfishing been conducted (e.g., PSA)	Yes	
B2a. Does a population status estimate or stock assessment exist for this species?	Yes	Based on the 2011 California Halibut Stock Assessment, the southern population is estimated to be depleted to about 14% of its unexploited spawning biomass level); 2020 California Halibut Stock Assessment, Executive Summary; California Halibut 2020 Stock Assessment Review Panel Report (CDFW 2022).
B2b. If yes, is there confidence in the underlying data such that a reasonable determination can be made if the stock is considered healthy, overfished, or depleted?	No	The CA halibut ESR (CDFW 2022) states that the results of the 2020 efforts were reviewed by a panel of stock assessment experts and found not to be ready for use in management, particularly for the northern stock. The California Halibut 2020 Stock Assessment Review Panel Report outlined recommendations for additional data collection, analysis, and model improvements, including reconstructing historical halibut landings to reflect an unfished or nearly unfished condition and initial population estimates.

Category and question	Response	Comments
B3a. Are there any existing state and/or federal management measures?	Yes	The minimum size limit is intended to allow halibut the opportunity to reproduce at least once before they become eligible for take by the fishery. Trawl fisheries are required to complete logbooks and under certain conditions they are subject to the requirements of the federal observer program and Vessel Monitoring Systems, which allows for monitoring of these gear types when fishing in federal waters or transiting federal waters with groundfish. Area closures and gear restrictions are intended to protect the halibut population, incidental co-occurring species, and habitat (CDFW 2022).
B3b. If yes, are they effective in ensuring sustainability?	Yes	The Department has not established formal overfishing criteria for the halibut resource. The MLMA defines overfishing as a rate or level of take that the best available scientific information, and other relevant information, indicates is not sustainable or that jeopardizes the capacity of a marine fishery to produce the maximum sustainable yield on a continuing basis. Department staff continue to monitor catch, effort, and life history trends with fishery-dependent and fishery-independent datasets on a monthly to annual basis. These data are evaluated relative to historic trends and environmental factors. If a problem is detected by the Department or reported by stakeholders, Department resources and management attention focus on the situation. The halibut fishery is currently being evaluated with a Management Strategy Evaluation (MSE) using the Data Limited Methods Toolkit framework which is intended to establish formal overfishing rules. Should the MSE or the stock assessment indicate that the halibut population is overfished, a rebuilding plan will be required. There are currently no formal indications that the halibut resource is overfished, although the stock status may be different north compared to south of Point Conception (CDFW 2022).
B4. Is the bycatch the product of recreational catch-and-release practices?	No	

Category and question	Response	Comments
B5. What is the estimated discard mortality rate given the characteristics of the fishery and gear type?	Unknown	Unknown for trawl. CDFW observers documented 16.8% instantaneous mortality during the 2022–2023 CHTG assessment.
B6. Do any post-release studies exist to verify the estimated mortality rate?	No	
B7. What is the probability of mortality exceeding levels that have been scientifically determined to be necessary for the continued viability of the species?	Unknown	
C. Impacts on fisheries		
C1. Does a directed fishery exist for the bycatch species?	Yes	The fishery is for legal size halibut 55.9 cm (22 in) and up.
C2. Has the bycatch and associated discard mortality been accounted for?	No	
C3. Is bycatch affecting the directed fishery management strategy (i.e., restrictions on size, sex, or season)?	No	Currently no, but this may be considered during a statewide process to determine bycatch acceptability with trawl gear.
C4. Are the impacts of bycatch considered and made explicit in an ESR or FMP?	No	Bycatch impacts of sublegal halibut are not explored in detail in the ESR (CDFW 2022).

Category and question	Response	Comments
C5a. Is the species constrained under a federal rebuilding plan?	No	
C5b. If yes, will bycatch compete with fleets that target the species?	Not applicable	
C6. Is there a management allowance for percent of catch or a prohibition on retention?	No	
C7. If there is a directed fishery for the species, have there been any of the following?		
C7a. Reductions in opportunities or income for participants in fisheries that target the bycatch species	No	
C7b. Reductions in fishery quotas or opportunities (e.g., time and area closures) based on bycatch issues?	No	
C7c. Early closures of a fishery based on higher-than-expected bycatch?	No	
C7d. Changes in fishing, processing, disposal, and marketing costs due to bycatch?	No	
C7e. Changes in the social or cultural value of fishing activities due to bycatch?	No	

Category and question	Response	Comments
C7f. Negative socioeconomic impacts from bycatch on fisheries and/or fishing communities which target or need incidental catch of this species?	None	

Appendix 1i. Evaluation of pink sea perch based on MLMA Master Plan bycatch criteria.

Category and question	**Response**	**Comments**
A. Legality of take		
A1. Under what laws, regulations, or guidance documents is species covered?	California Code of Regulations, Title 14, section 27.60	There is a default recreational 10 fish limit.
A2. Are there prohibitions against take using specific gear type?	No	
A3. Is the species a target species that requires discard of individuals based on size limits, seasons, or gear type restrictions?	NO	Pink sea perch are not commercially or recreationally targeted or retained.
A4. Is the discard mortality rate known?	Unknown	Unknown for trawl. CDFW observers documented 89.4% instantaneous mortality during the 2022–2023 CHTG assessment.
A5a. Are special permits required to retain or interact with the species?	No	
A5b. If yes, does the fishery currently have such permits?	Not applicable	
A5c. If yes, do the levels of bycatch comply with them?	Not applicable	

Category and question	Response	Comments
A6a. Does the species have an incidental catch allowance, ACL, or other restrictions on the amount, size, or sex of catch allowed?	No	Pink sea perch are not commercially or recreationally targeted or retained.
A6b. If yes, does the catch comply with them?	Not applicable	
B. Threats to sustainability		
B1. Has a peer-reviewed risk assessment of the vulnerability of the particular bycatch species to overfishing been conducted (e.g., PSA)	No	
B2a. Does a population status estimate or stock assessment exist for this species?	No	
B2b. If yes, is there confidence in the underlying data such that a reasonable determination can be made if the stock is considered healthy, overfished, or depleted?	Not applicable	

Category and question	Response	Comments
B3a. Are there any existing state and/or federal management measures?	Yes	There is a state default recreational 10 fish limit. However, this species is not targeted or retained by commercial or recreational fishermen.
B3b. If yes, are they effective in ensuring sustainability?	unknown	
B4. Is the bycatch the product of recreational catch-and-release practices?	No	
B5. What is the estimated discard mortality rate given the characteristics of the fishery and gear type?	Unknown	Unknown for trawl. CDFW observers documented 89.4% instantaneous mortality during the 2022–2023 CHTG assessment. Typically, the large cod-end mesh used in the CHTG allows pink sea perch to pass unless the net is clogged with debris.
B6. Do any post-release studies exist to verify the estimated mortality rate?	No	
B7. What is the probability of mortality exceeding levels that have been scientifically determined to be necessary for the continued viability of the species?	Unknown	
C. Impacts on fisheries		
C1. Does a directed fishery exist for the bycatch species?	No	

Category and question	Response	Comments
C2. Has the bycatch and associated discard mortality been accounted for?	No	
C3. Is bycatch affecting the directed fishery management strategy (i.e., restrictions on size, sex, or season)?	No	
C4. Are the impacts of bycatch considered and made explicit in an ESR or FMP?	No	
C5a. Is the species constrained under a federal rebuilding plan?	No	
C5b. If yes, will bycatch compete with fleets that target the species?	Not applicable	
C6. Is there a management allowance for percent of catch or a prohibition on retention?	No	
C7. If there is a directed fishery for the species, have there been any of the following?		There is no directed fishery for pink sea perch.

Category and question	Response	Comments
C7a. Reductions in opportunities or income for participants in fisheries that target the bycatch species	No	
C7b. Reductions in fishery quotas or opportunities (e.g., time and area closures) based on bycatch issues?	No	
C7c. Early closures of a fishery based on higher-than-expected bycatch?	No	
C7d. Changes in fishing, processing, disposal, and marketing costs due to bycatch?	No	
C7e. Changes in the social or cultural value of fishing activities due to bycatch?	No	
C7f. Negative socioeconomic impacts from bycatch on fisheries and/or fishing communities which target or need incidental catch of this species?	None	
C7g. Negative impacts to juveniles of a species targeted by another fishery?	No	

Category and question	Response	Comments
D. Impacts on ecosystem		
D1. What is the ecosystem role of the bycatch species?		The pink sea perch is a predator of benthic worms, brittle start, and small crustaceans and a basal prey source for larger fishes.
D2. Does scientific evidence show the amount of bycatch mortality significantly increases the risk that a bycatch species will be unable to serve its ecosystem role?	None available	
References	Add specific references you used other than the general ones listed in Question A1.	Froese, R., and D. Pauly, editors. 2025. FishBase. World Wide Web electronic publication. www.fishbase.org (Accessed: Nov 2025)

Appendix 1j. Evaluation of English sole based on MLMA Master Plan bycatch criteria.

Category and question	**Response**	**Comments**
A. Legality of take		
A1. Under what laws, regulations, or guidance documents is species covered?	Federal Code of Regulations, Title 50; Managed groundfish	Federal Code of Regulations, Title 50, section 660.23 establishes fixed gear limits, section 660.55: established an allocation limit.
A2. Are there prohibitions against take using specific gear type?	No	
A3. Is the species a target species that requires discard of individuals based on size limits, seasons, or gear type restrictions?	No	
A4. Is the discard mortality rate known?	Unknown	Unknown for trawl; however, CDFW observers documented 8.3% instantaneous mortality during the 2022–2023 CHTG assessment.
A5a. Are special permits required to retain or interact with the species?	No	
A5b. If yes, does the fishery currently have such permits?	Not applicable	
A5c. If yes, do the levels of bycatch comply with them?	Not applicable	

Category and question	Response	Comments
A6a. Does the species have an incidental catch allowance, ACL, or other restrictions on the amount, size, or sex of catch allowed?	Yes	A quota amount is set under PFMC Groundfish Management Plan (GMP).
A6b. If yes, does the catch comply with them?	Yes	Directed catch is primarily by the groundfish fleet. Retention by the halibut trawl fleet is minimal.
B. Threats to sustainability		
B1. Has a peer-reviewed risk assessment of the vulnerability of the particular bycatch species to overfishing been conducted (e.g., PSA)	No	
B2a. Does a population status estimate or stock assessment exist for this species?	Yes	English sole was assessed in 2013 under GMP and was not overfished.
B2b. If yes, is there confidence in the underlying data such that a reasonable determination can be made if the stock is considered healthy, overfished, or depleted?		The stock is not overfished. The directed catch is less than 1% of groundfish trawl quota.

Category and question	Response	Comments
B3a. Are there any existing state and/or federal management measures?	Yes	There is a state default recreational 10 fish limit. However, the species is not targeted or retained by recreational anglers. There are commercial catch limits established under GMP.
B3b. If yes, are they effective in ensuring sustainability?	Yes	
B4. Is the bycatch the product of recreational catch-and-release practices?	No	
B5. What is the estimated discard mortality rate given the characteristics of the fishery and gear type?	Unknown	Unknown for trawl; however, CDFW observers documented 8.3% instantaneous mortality during the 2022–2023 CHTG assessment.
B6. Do any post-release studies exist to verify the estimated mortality rate?	No	
B7. What is the probability of mortality exceeding levels that have been scientifically determined to be necessary for the continued viability of the species?	Unknown	Unknown but probably low. The directed trawl fishery takes little of the quota and the southern halibut fishery retains little. The required large cod-end mesh may contribute to reduced net retention.
C. Impacts on fisheries		
C1. Does a directed fishery exist for the bycatch species?	Yes	A directed groundfish trawl fishery exists.

Category and question	Response	Comments
C2. Has the bycatch and associated discard mortality been accounted for?	Yes	They are accounted for under federal catch limits by fishing sector.
C3. Is bycatch affecting the directed fishery management strategy (i.e., restrictions on size, sex, or season)?	No	
C4. Are the impacts of bycatch considered and made explicit in an ESR or FMP?	Yes	The species is managed under the GMP.
C5a. Is the species constrained under a federal rebuilding plan?	No	
C5b. If yes, will bycatch compete with fleets that target the species?	Not applicable	
C6. Is there a management allowance for percent of catch or a prohibition on retention?	No	
C7. If there is a directed fishery for the species, have there been any of the following?		There is a federal groundfish fishery.

Category and question	Response	Comments
C7a. Reductions in opportunities or income for participants in fisheries that target the bycatch species	No	
C7b. Reductions in fishery quotas or opportunities (e.g., time and area closures) based on bycatch issues?	No	
C7c. Early closures of a fishery based on higher-than-expected bycatch?	No	
C7d. Changes in fishing, processing, disposal, and marketing costs due to bycatch?	No	
C7e. Changes in the social or cultural value of fishing activities due to bycatch?	No	
C7f. Negative socioeconomic impacts from bycatch on fisheries and/or fishing communities which target or need incidental catch of this species?	None	

Category and question	Response	Comments
C7g. Negative impacts to juveniles of a species targeted by another fishery?	No	
D. Impacts on ecosystem		
D1. What is the ecosystem role of the bycatch species?		The English sole is a predator of benthic worms, brittle stars, and small crustaceans.
D2. Does scientific evidence show the amount of bycatch mortality significantly increases the risk that a bycatch species will be unable to serve its ecosystem role?	None available	
References	Add specific references you used other than the general ones listed in Question A1.	