

SECRETARIAL REVIEW DRAFT
ENVIRONMENTAL ASSESSMENT / REGULATORY IMPACT REVIEW /
INITIAL REGULATORY FLEXIBILITY ANALYSIS for

Amendment 73 to the Fishery Management Plan for Groundfish of the
Bering Sea and Aleutian Islands Management Area
and
Amendment 77 to the Fishery Management Plan for Groundfish of the Gulf of Alaska

Revised Management Authority for Dark Rockfish (*Sebastes ciliatus*)

Prepared by staff of the
North Pacific Fishery Management Council
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Abstract: This Environmental Assessment, Regulatory Impact Review and Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) describes the proposed amendment to remove dark rockfish (*Sebastes ciliatus*) from the Gulf of Alaska Groundfish Fishery Management Plan (FMP), and from the Bering Sea Aleutian Islands Groundfish FMP. Dark rockfish make up a small proportion of the total biomass in the pelagic shelf rockfish complex in the Gulf of Alaska, and in the “other rockfish” complex in the Bering Sea and Aleutian Islands area. This species is more often found in nearshore waters, and is caught in fisheries managed by the State of Alaska. Removing this species from these FMPs would allow the State of Alaska to manage this species in both State and Federal waters off Alaska. This EA/RIR/IRFA addresses the requirements of the National Environmental Policy Act, Presidential Executive Order 12866, and the Regulatory Flexibility Act.

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EXECUTIVE SUMMARY

This Environmental Assessment, Regulatory Impact Review and Initial Regulatory Flexibility Analysis addresses Amendment 73 to the Fishery Management for Groundfish of the Bering Sea and Aleutian Islands Management Area, and Amendment 77 to the Fishery Management Plan for Groundfish of the Gulf of Alaska (Amendments 73/77). These amendments propose to remove dark rockfish (*Sebastes ciliatus*) from the fishery management plans (FMPs). This species is currently contained in the pelagic shelf rockfish (PSR) complex in the Gulf of Alaska (GOA), and in the “other rockfish” complex in the Bering Sea and Aleutian Islands Area (BSAI). Dark rockfish make up a small proportion of the total biomass in each complex. They are most often found in nearshore waters, and caught in fisheries in State of Alaska (State) waters. Removing this species from the FMPs would allow the State to manage this species throughout its range in both State and Federal waters off Alaska.

The Council developed the following problem statement for this analysis:

Dark rockfish are a nearshore, shallow water species that are rarely caught in offshore, Federal waters. For management purposes, they are contained within the pelagic shelf rockfish complex in the GOA, whose overfishing limit and acceptable biological catch are based primarily on the stock assessment for dusky rockfish, which makes up the majority of the total exploitable biomass estimate for the PSR complex. In the BSAI, dark rockfish are contained within the “other rockfish” complex, whose biomass is largely comprised of dusky rockfish and thornyhead rockfish. As dark rockfish have now been identified as a separate species, are found in nearshore, shallow waters, and could potentially be locally overfished within the larger PSR complex’s total allowable catch in the GOA, the Council should consider removing this species from the GOA groundfish FMP, thereby transferring their management to the State of Alaska. For consistency in management, the Council should also consider removing this species from the BSAI FMP.

Two alternatives are analyzed in this document:

Alternative 1: Continue managing dark rockfish within the larger pelagic shelf rockfish complex in the GOA, and continue managing dark rockfish within the “other rockfish” complex in the BSAI

Alternative 2: Remove dark rockfish from the GOA groundfish FMP and BSAI groundfish FMP, and allow the State of Alaska to manage catch of this species in both State and Federal waters.

Conceptually, another alternative may have been to adopt the suggested change in dark rockfish management only within the GOA, while retaining Federal management of this relatively rarely encountered species in the off-shore BSAI fisheries, as under the current BSAI FMP. However, initial examination of this concept immediately revealed management, enforcement, and administrative complexities associated with the resulting regulatory inconsistency in managing dark rockfish across its range off Alaska. These made further consideration of this alternative undesirable and inconsistent with the expressed objectives of this action.

Environmental Assessment

There is limited impact in Federal waters from removing dark rockfish from either FMP. This action specifically concerns the management of dark rockfish, the GOA PSR complex, and BSAI “other rockfish” complex. Dark rockfish comprise a small proportion of the total biomass in the PSR complex, which is dominated by the target species, dusky rockfish. Impacts to other PSR stocks, as well as other

groundfish stocks, are minimal due to the relatively minor contribution to the overall exploitable biomass from the dark rockfish stock. Dark rockfish makes up a very minor component of the total biomass in the “other rockfish” complex in the BSAI. This is not a target species, and retained catch of “other rockfish” is dominated by shortspine thornyhead rockfish and dusky rockfish. These two species make up the majority of the biomass in the complex.

Management of dark rockfish by the State is anticipated to be an improvement over Federal management within the PSR complex, due to the State’s ability to manage this species as a single stock, and on smaller management areas, to protect against the potential for localized depletion of dark rockfish. No impacts are anticipated on marine mammals, seabirds, threatened or endangered species, habitat, or the ecosystem.

Regulatory Impact Review

Removal of dark rockfish from the PSR complex in the GOA could result in improved management of dark rockfish in the GOA and BSAI. There should not be any significant adverse impact on persons taking dark rockfish as incidental catch, or targeting dark rockfish in the Western GOA or Southeast Outside. Moreover, there are potential benefits if an inshore dark rockfish fishery emerges. On the other hand, there may be reduced TACs and revenues from PSR harvests in the Central GOA and in West Yakutat. No significant costs are expected in the BSAI. Net impacts cannot be determined quantitatively.

This action does not respond to a market failure, since the fishery is already managed so as to address common property issues. This action does create an opportunity to shift management responsibility and authority from the Federal government to the State of Alaska, in order to provide for more effective management of a stock that occurs primarily with in State waters and, thereby, an improved governmental process.

Initial Regulatory Flexibility Analysis

In 2006, there were no small processors, but there were 81 small catcher vessels, as those terms are defined for RFA purposes, that landings of pelagic shelf rockfish from the GOA, taken as either targeted or incidental catch fish. The 81 small catcher vessels included 74 that used hook-and-line, pot, or jig gear, and seven that used pelagic or non-pelagic trawl gear. The 81 small catcher vessels averaged about \$400,000 in gross revenues from all sources. In 2006, one small catcher/processor, and 36 small catcher vessels, reported incidental catch landings of pelagic shelf rockfish in the BSAI. All together, there were 35 vessels that used hook-and-line, pot, or jig gear, and two that used trawl gear. The 37 small vessels averaged about \$1.4 million in gross revenues from all sources.

The preferred alternative may have adverse impacts on directly regulated small operations targeting pelagic shelf rockfish in the Central GOA and in the West Yakutat district. NMFS does not expect the action to have adverse impacts on operations targeting rockfish in the Southeast Outside and Western regions of the GOA, or in the BSAI (targeting does not appear to be significant in the Southeast Outside or BSAI). NMFS does not expect the action to have adverse impacts on operations taking dark rockfish as incidental catch. In the Central GOA, most of the adverse impact would fall on participants in the Central GOA Rockfish Pilot Project. Because of the affiliations these operations have through the quota management and allocation features of the pilot project, NMFS does not believe these operations can be considered small entities for the purpose of the RFA. NMFS has not identified an alternative that has smaller impacts on directly regulated small entities, but that still meets the objectives of this action.

Council Preferred Alternative

The Council took final action in April 2007, to recommend Alternative 2 to remove dark rockfish from Federal management in both the BSAI and GOA groundfish FMPs. Regulations to promulgate this change are anticipated to be in place in 2008. This would mean that Federal harvest specifications for the pelagic shelf rockfish complex in the GOA, and for the “other rockfish” complex in the BSAI, will include dark rockfish in the Federal groundfish TACs for the 2008/2009 groundfish specifications process, but dark rockfish will be removed from the Federal FMPs and TACs, starting with the final groundfish specifications for 2009/2010.

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1.0 PURPOSE AND NEED FOR ACTION

The groundfish fisheries in the Exclusive Economic Zone (EEZ) (3 to 200 miles offshore) in the Gulf of Alaska (GOA) and the Bering Sea and Aleutian Islands area (BSAI) are managed under the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA groundfish FMP) and the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI groundfish FMP). These fishery management plans (FMPs) were developed by the North Pacific Fishery Management Council (Council) under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

The Council took final action April 2007, to recommend Amendment 73 to the BSAI groundfish FMP and Amendment 77 to the GOA groundfish FMP. These amendments would remove dark rockfish from Federal management in both the GOA and BSAI. Dark rockfish make up a small proportion of the total biomass in the pelagic shelf rockfish (PSR) complex in the GOA, and in the “other rockfish” complex in the BSAI. This species is more often found in nearshore waters, and is caught in State of Alaska (State) managed fisheries. Removing this species from these FMPs would turn management for this species, in both State and Federal waters, over to the State.

Actions taken to amend FMPs, or implement other regulations governing the groundfish fisheries, must meet the requirements of Federal laws and regulations. In addition to the Magnuson-Stevens Act, the most important of these are the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), Executive Order (E.O.) 12866, and the Regulatory Flexibility Act (RFA).

NEPA, E.O. 12866, and the RFA require a description of the purpose and need for the proposed action, as well as a description of alternative actions that may address the problem. This information is included in Chapters 1 and 2 of this document. Chapter 3 describes the affected environment, and Chapter 4 provides the analysis of its environmental impacts. Chapter 5 contains a Regulatory Impact Review (RIR), which addresses the requirements of both E.O. 12866 and the RFA that economic impacts of the alternatives be considered. Chapter 6 contains an Initial Regulatory Flexibility Analysis (IRFA) that discusses the potential impacts on small entities, as required by the RFA.

1.1 Purpose and Need

Dark rockfish are part of the pelagic shelf rockfish complex defined in the GOA groundfish FMP. Members of this complex include the following four species: dusky rockfish (*Sebastes variabilis*), dark rockfish (*S. ciliatus*), yellowtail rockfish (*S. flavidus*), and widow rockfish (*S. entomelas*). Under the BSAI groundfish FMP, dark rockfish are contained within the “other rockfish” complex, which contains the following eight species: red banded rockfish (*Sebastes babcocki*), dark rockfish, dusky rockfish, redstripe rockfish (*S. proriger*), yelloweye rockfish (*S. ruberrimus*), harlequin rockfish (*S. variegatus*), sharpchin rockfish (*S. zacentrus*), and shortspine thornyhead (*Sebatolobus alascanus*).

The forms of dusky rockfish commonly recognized as “light dusky rockfish” and “dark dusky rockfish” are now officially recognized as two distinct species (Orr and Blackburn 2004). *S. variabilis* applies to variably colored, deeper-water species with a common name dusky rockfish, and *S. ciliatus* applies to the dark shallow-water species, with a common name dark rockfish.

The purpose of the proposed action is to remove dark rockfish from the BSAI and GOA groundfish FMPs, to allow improved management by the State. The Council developed the following problem statement to describe the need for the action in both BSAI and GOA:

Dark rockfish are a nearshore, shallow water species that are rarely caught in offshore, Federal waters. For management purposes, they are contained within the pelagic shelf rockfish complex in the GOA, whose overfishing limit and acceptable biological catch are based primarily on the stock assessment for dusky rockfish, which makes up the majority of the total exploitable biomass estimate for the PSR complex. In the BSAI, dark rockfish are contained within the “other rockfish” complex, whose biomass is largely comprised of dusky rockfish and thornyhead rockfish. As dark rockfish have now been identified as a separate species, are found in nearshore, shallow waters, and could potentially be locally overfished within the larger PSR complex’s total allowable catch in the GOA, the Council should consider removing this species from the GOA groundfish FMP, thereby transferring their management to the State of Alaska. For consistency in management, the Council should also consider removing this species from the BSAI FMP.

Removing dark rockfish from the FMPs is necessary for the following reasons: (1) dark rockfish is now recognized as a separate species, (2) distribution of dark rockfish in nearshore habitats that are not specifically assessed by the trawl surveys, (3) data in the stock assessments for PSR in the GOA and “other rockfish” in the BSAI are predominantly from dusky rockfish, not dark rockfish, and (4) the risk of overfishing dark rockfish in local areas, given the relatively high TAC for the PSR and “other rockfish” complexes, as a whole.

Management by the State of Alaska would better address localized assessment and harvest requirements for this nearshore species than is currently provided by Federal management, under the larger PSR complex in the GOA and the “other rockfish” complex in the BSAI. A similar situation exists for dark rockfish was addressed by Amendment 46 to the GOA groundfish FMP, which removed black rockfish and blue rockfish, nearshore rockfish populations which were not thought to be well-assessed by the trawl survey, from the GOA groundfish FMP, and turned management over to the State of Alaska (NPFMC 1998).

1.2 Related NEPA Documents

The NEPA documents listed below have detailed information on the groundfish fisheries, and on the natural resources, the economic and social activities, and communities affected by those fisheries:

- The Alaska Groundfish Harvest Specifications Final Environmental Impact Statement (Groundfish EIS; NMFS 2007)
- Programmatic supplemental environmental impact statement for the Alaska groundfish fisheries implemented under the authority of the fishery management plans for the groundfish fishery in the GOA and BSAI. (PSEIS; NMFS 2004)
- Essential Fish Habitat Environmental Impact Statement (EIS; NMFS 2005)
- SSL Protection Measures Supplemental Environmental Impact Statement (SEIS; NMFS 2001)

These documents can be found on the NMFS Alaska Region web page at www.alaskafisheries.noaa.gov.

2.0 DESCRIPTION OF ALTERNATIVES

Ultimately, two alternatives are analyzed in this document: Alternative 1, continue managing dark rockfish within the larger PSR complex in the GOA and the “other rockfish” complex in the BSAI; and Alternative 2, remove dark rockfish from the GOA groundfish FMP and BSAI groundfish FMP and turn management over to the State of Alaska.

2.1 Alternative 1: Status quo

Under this alternative, dark rockfish would continue to be managed within the GOA pelagic shelf rockfish complex and the BSAI “other rockfish” complex. The Council and the NMFS would retain management authority for dark rockfish within the EEZ.

In the GOA, overfishing limits (OFLs) are established for the complex, and managed Gulf-wide (combined for eastern GOA, central GOA and western GOA management areas, Figure 1). Acceptable biological catch (ABC) limits and total allowable catch (TAC) limits are established for the complex as a whole and managed by individual region. The EGOA includes areas 640 and 650, the CGOA includes areas 620 and 630, while the WGOA is area 610 (Figure 1). In-season, catch is managed through monitoring directed fishing, with the fishery closed when directed fishing is estimated to leave only the portion of the TAC necessary to support incidental catch in other directed fisheries. Once the directed fishery is closed, incidental catch is managed under the aggregate rockfish maximum retainable amount (MRA), which limits catch of most rockfish of the genera *Sebastes* and *Sebastolobus*¹ to between 0 percent and 15 percent of the weight of the retained catch of species open to directed fishing (see Table 10 to part 679).

In the BSAI, the OFL is established area-wide (combined for Bering Sea and Aleutian Island areas, Figure 1). ABC limits and TAC limits are established for the complex, as a whole, and managed by individual area. Here the Aleutian Islands (AI) area includes areas 541, 542 and 543, while the Bering Sea (BS) area includes the remaining areas (530, 523, 521, 524, 514, 513, 517, 518, 509, 516, 512, 508, Figure 1). There is no directed fishing on the “other rockfish” complex. The TAC is established to meet incidental catch needs in other directed fisheries. Incidental catch is managed under the aggregate rockfish MRA, which limits catch of most rockfish of the genera *Sebastes* and *Sebastolobus* to between 0 percent and 15 percent of the weight of the retained catch of species open to directed fishing (see Tables 11 to part 679).

¹ The aggregated rockfish category includes all rockfish of the genera *Sebastes* and *Sebastolobus*, except black rockfish and blue rockfish in the GOA; demersal shelf rockfish in the Southeast Outside District of the GOA; and shortraker and rougheyeye rockfish in the Eastern Regulatory Area of the GOA.

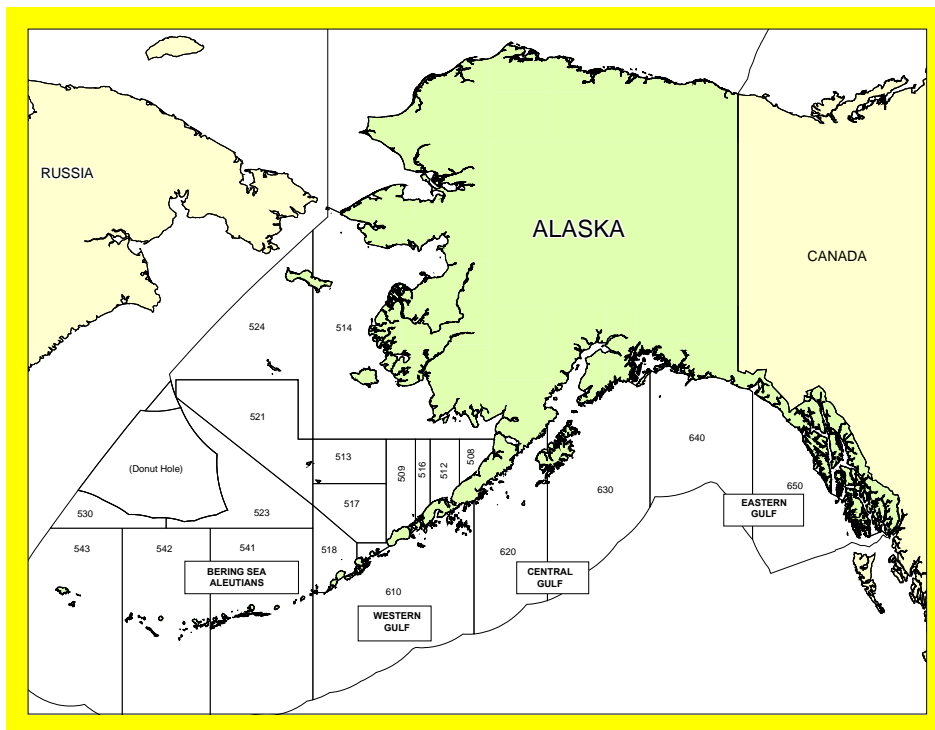


Figure 1 National Marine Fisheries Service statistical and reporting areas.

2.2 Alternative 2: Remove dark rockfish from the GOA and BSAI Groundfish FMPs (preferred)

Under section 303(a)(3) of the Magnuson-Stevens Act, a State may regulate a fishing vessel outside the boundaries of the State, if the vessel is registered under the laws of the State and there is no fishery management plan or other applicable Federal fishing regulations for the fishery in which the vessel is operating. Alternative 2 would remove dark rockfish from the GOA groundfish FMP, and from the BSAI groundfish FMP, which would allow the State to manage the catch of this species in both State and Federal waters off Alaska.

OFLs, ABCs, and TACs would continue to be specified for the GOA PSR and BSAI “other rockfish” complex, but this complex would no longer include dark rockfish. The State would take on the responsibility for assessment and management of the dark rockfish stock.

In managing dark rockfish, the State of Alaska could develop a fishery management plan for the species, under which gear type, season, and guideline harvest level (GHL) for the species would be specified. These management plans would be expected to be prepared by the Alaska Department of Fish and Game and reviewed by the Alaska Board of Fisheries. State management would include regulation of any directed fishing for dark rockfish. Dark rockfish catch by State-permitted vessels participating in both State and Federal fisheries would be limited by a separate bycatch limit, as established by the State.² It is

² The State would not have regulatory authority over bycatch by vessels fishing in Federal waters without a State license. However, as discussed in Sections 4.2.1 and 4.2.3 all catcher vessels, and most catcher/processors that are licensed for Federal waters appear to carry Alaska licenses as well. Moreover, catcher/processors have not targeted dark rockfish and their incidental catch of dark rockfish is historically much lower (less than one percent) than the incidental catch limit the State is likely to establish.

likely that a small directed fishery and/or bycatch-only restrictions would be applied in the AI region. More information regarding the spatial scales of management regions for the State in the AI area are contained under section 3.4.2.

While specific management plans have not yet been formulated by the State, it is likely that measures used currently (e.g., in management of black rockfish) would be among those considered for dark rockfish management by the State (D. Carlile, pers. comm.).

These candidate measures would include, but not necessarily be limited to the following:

- Guideline harvest limits (GHLs, or quotas)
- Gear-, area-, and directed-fishery-specific bycatch limits, wherein catch in excess of bycatch limits would be reported as bycatch overage on an ADF&G fish ticket, the excess bycatch would be required to be landed, with all proceeds from the sale of excess dark rockfish bycatch surrendered to the State.
- Full retention of all rockfish caught, with proceeds of the sale of any bycatch overage paid to the State of Alaska.
- Directed fisheries for dark rockfish in some areas of the State; in others perhaps bycatch only.
- No-take zones, wherein dark rockfish might not be allowed to be taken in a directed fishery and proceeds from any bycatch would be surrendered to the State.
- Gear restrictions (e.g. jig only) for directed fisheries.
- Trip limits.
- Reporting requirements, such as submission of ADF&G fish tickets and/or logbooks.
- Vessel registrations for specific directed dark rockfish fishery management areas.

Management measures would likely vary by the State's regions (Figure 2). For all regions the primary potential improvement for the management of the species would arise from the State's ability to regulate fisheries (e.g. openings and closings, area closures, etc. through the release of Emergency Orders) on much shorter notice, over smaller geographic areas, and with less supporting data than is normally required under Federal management. Further description of management by region (and smaller districts within each region shown in Figure 2) is contained in section 3.1.4.

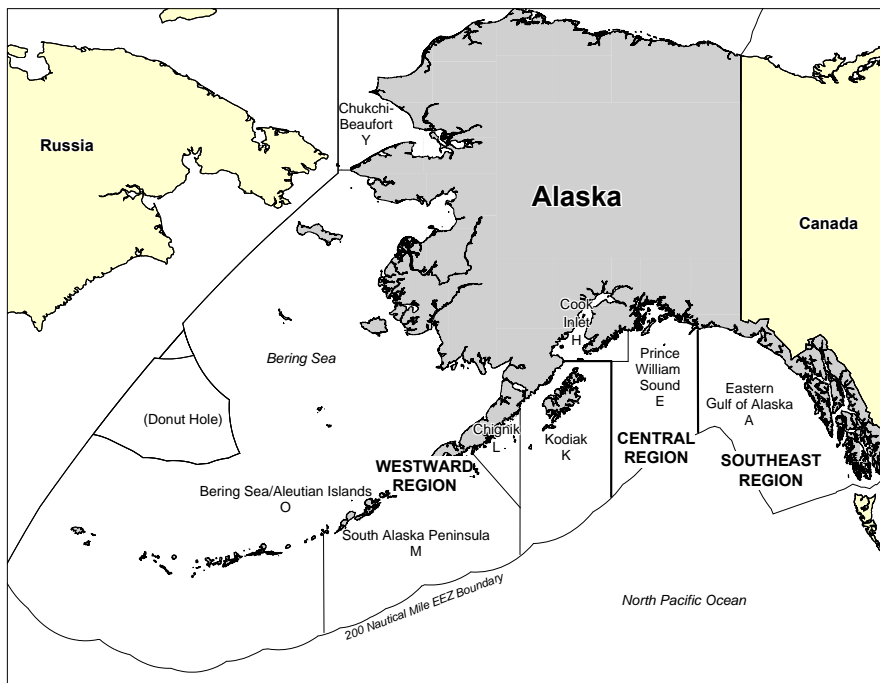


Figure 2 Alaska Department of Fish and Game groundfish registration areas and regions.

In Southeast, dark rockfish would likely be managed as part of a complex that includes black rockfish and blue rockfish, for which there is a directed fishery. In the Central Region, dark rockfish would likely be managed as part of the fisheries (directed in the Cook Inlet Area; bycatch-only in the Prince William Sound Area) for a complex of pelagic shelf rockfish that also includes dusky, widow, yellowtail, black, and blue rockfishes. The Prince William Sound Rockfish Management Plan requires full retention of all rockfish caught; proceeds of the sale of any bycatch overage are surrendered to the State of Alaska. In the Westward Region, dark rockfish would likely be managed as a part of the directed black rockfish fishery.

2.3 Alternative Considered but not Carried Forward

The Council also considered an additional alternative to the proposed action that was not carried forward for analysis. This alternative was to transfer management authority of dark rockfish to the State of Alaska while retaining the species under the Federal FMPs. Demersal shelf rockfish in Southeast Alaska is under a similarly delegated management program with the State of Alaska. A similar alternative was considered and rejected for black rockfish and blue rockfish under Amendment 46 to the GOA FMP. This alternative was not carried forward for dark rockfish because (1) State personnel would be required to comply with additional Federal management processes that may not be consistent with State procedures; (2) the State would need to meet both State and Federal requirements, which often prescribe different time-frames for management actions (e.g., notice, public meetings, and reports); and (3) the State did not believe it could meet the costly assessment requirements for managing a nearshore species, mandated under a Federal management plan (NPFMC 1998).

3.0 AFFECTED ENVIRONMENT

Chapter 3 in the Groundfish EIS and in the PSEIS contain a complete description of the human environment, including the GOA and BSAI physical environment, habitat, groundfish life histories, marine mammals, seabirds, groundfish fisheries, and management. These descriptions are incorporated by reference.

In addition to the factors discussed in the Groundfish EIS and PSEIS, this action specifically concerns the management of dark rockfish and the GOA PSR and BSAI “other rockfish” complexes. A description of the general distribution, habitat requirements, life history, and stock status of dark rockfish, along with a discussion of the other groundfish stocks impacted, is included here.

3.1 General distribution and habitat requirements of dark rockfish

In the GOA FMP, dark rockfish are managed as part of the shelf rockfish (PSR) complex. Four species comprise this complex: dusky rockfish (*Sebastes variabilis*), dark rockfish (*S. ciliatus*), yellowtail rockfish (*S. flavidus*), and widow rockfish (*S. entomelas*). In the Bering Sea Aleutian Islands FMP, dark rockfish are contained within the “other rockfish” complex which contains the following eight species: red banded rockfish (*Sebastes babcocki*), dark rockfish, dusky rockfish, redstripe rockfish (*S. proriger*), yelloweye rockfish (*S. ruberrimus*), harlequin rockfish (*S. variegatus*), sharpchin rockfish (*S. zacentrus*), shortspine thornyhead (*Sebatolobus alascanus*).

The forms of dusky rockfish commonly recognized as “light dusky rockfish” and “dark dusky rockfish” are now officially recognized as two species (Orr and Blackburn 2004). *S. variabilis* applies to variably colored deeper-water species with a common name dusky rockfish, and *S. ciliatus* applies to the dark shallow-water species with a common name dark rockfish. Dusky rockfish are often found in large aggregations over the outer continental shelf and upper slope to depths of 675m (Orr and Blackburn, 2004). Dark rockfish are found in more shallow habitats from nearshore rocky reefs to depths no greater than 160m (Orr and Blackburn 2004).

The range of dark rockfish extends from the western Aleutian Islands and eastern Bering Sea, through the Gulf of Alaska, to southeast Alaska (Orr and Blackburn 2004). Throughout its range it is common in depths ranging from 5m to 160m (Orr and Blackburn 2004). Dark rockfish are commonly collected with black rockfish (*S. melanops*) by trawl and hook-and-line gear in shallow waters and are often misidentified as black rockfish (Orr and Blackburn 2004). In deeper trawls in the Aleutian Islands and Gulf of Alaska dark rockfish are found in association with Pacific ocean perch (*S. alutus*), northern rockfish (*S. polyspinus*) and dusky rockfish (Orr and Blackburn 2004). Dark rockfish are occasionally found in association with “other rockfish”es such as harlequin rockfish, sharpchin rockfish, and redstripe rockfish (Orr and Blackburn 2004).

ADF&G conducted a sampling study in the Gulf of Alaska and Eastern Aleutian Islands from 2001 to 2006 for black rockfish and dark rockfish (Figure 3). Results indicated that habitat use for dark rockfish changes with ontogeny. The smallest fish sampled, 10-30 cm and less than 10 years old, were collected in 1-5 m of water using herring jigs and gillnets and were found very near shore in boulder fields, commonly in harbor breakwaters. With increasing age, dark rockfish move offshore to deeper water and were captured with jig gear in 6-50 m. Video observations by ADF&G have shown that adult dark rockfish are semi-demersal, occur in rocky areas, and sometimes utilize boulder interstitial areas. Preliminary results of reproductive studies conducted in the Kodiak area by ADF&G indicate copulation in dark rockfish occurs in January and February, with fertilization in April and parturition peaking in May and June (D. Urban, ADF&G, pers. comm.).

Study results also showed that dark and black rockfish often occur in the same locations. Of 1,133 sampling locations by ADF&G in Gulf of Alaska and Eastern Aleutian Islands from 2001 to 2006, 26% captured both dark and black rockfish (Figure 3). Co-occurrence was seen across the central and western Gulf of Alaska as well as the eastern Aleutian Islands (Figure 4). Because the sampling was done with jig gear which is subject to fishing bias, these results may not document relative population densities, but do reflect at minimum presence of the two species.

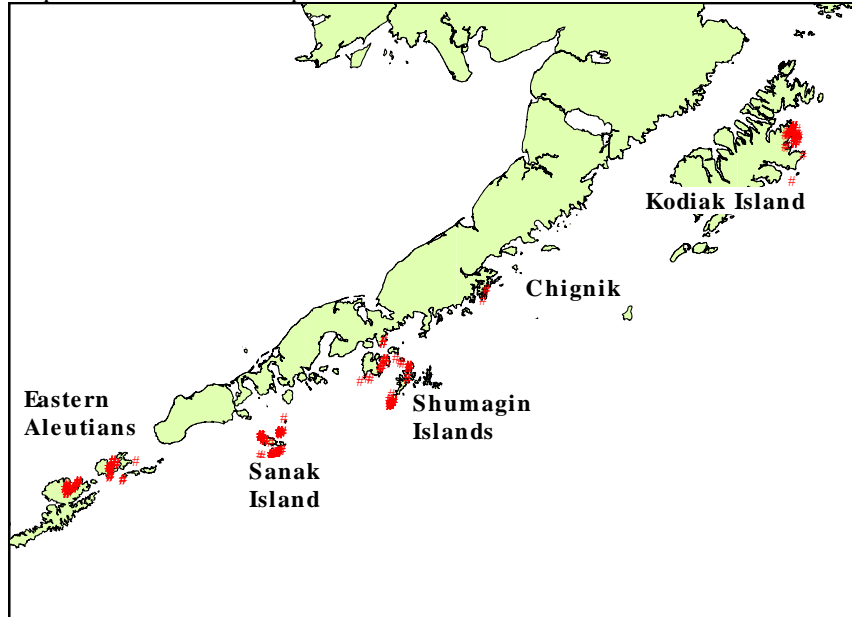
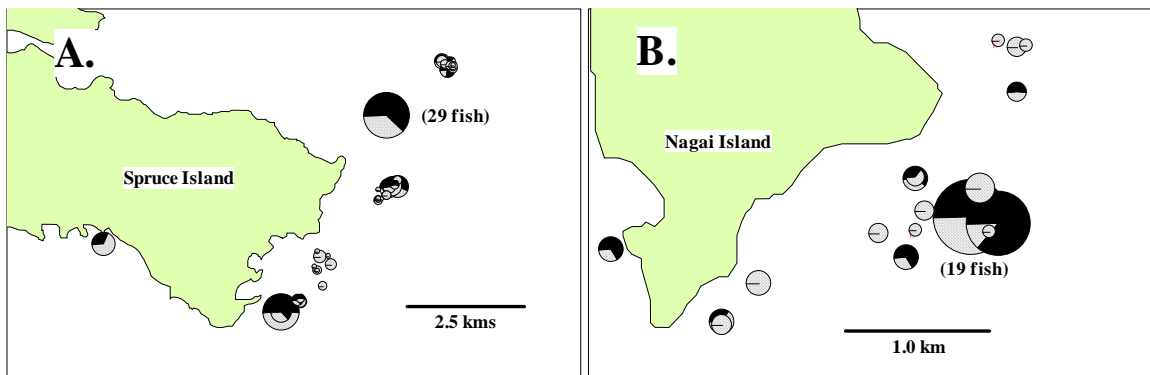


Figure 3 Locations where dark rockfish were captured during ADF&G surveys, 2001-2006. Survey locations were not systematically distributed but targeted known fish concentrations.



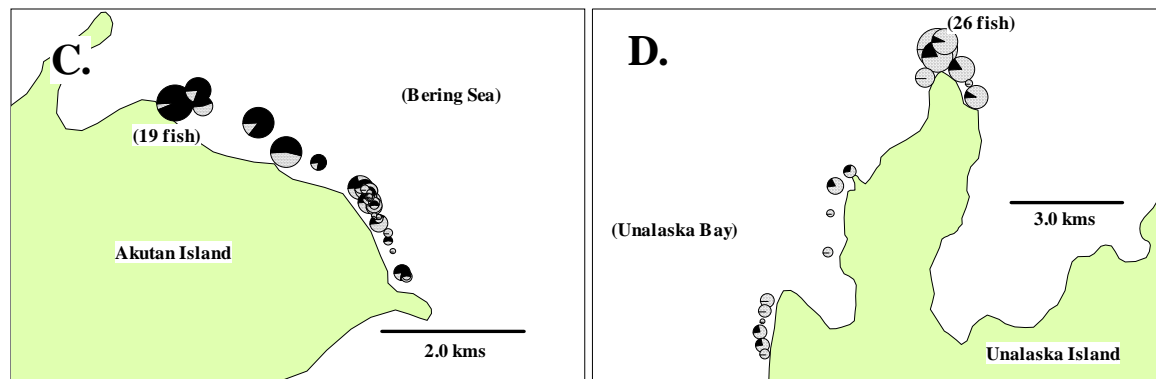


Figure 4 Pie charts of black (black portion) and dark (white portion) rockfish catches in: **A.** Spruce Island near the city of Kodiak, **B.** Mountain Point on Nagai Island in the Shumagin Island group, **C.** the north side of Akutan Island in the eastern Aleutian Islands and **D.** the NE side of Unalaska is near Unalaska Bay.

The ecological separation of these two morphologically similar cogeners is not well understood although underwater video reveals the darks to be more solitary and demersal while the blacks typically are a schooling fish well up in the water column (Dan Urban, ADF&G, personal observations). A food habits study of 142 black and 84 dark rockfish was conducted by ADF&G in the Shumagin Islands. Stomachs were collected over a 10 day period in August 2005. It showed that these two species had a 29% diet overlap (Renkonen Index) with similar niche breadth (standardized Levin’s measure, dark RF = 0.25, black RF 0.29). Black rockfish generally ate more fish (mostly sand lance and Pacific cod) while dark rockfish relied more on invertebrates, largely pteropods, decapod larvae, and jellyfish (Figure 5, ADF&G unpublished data).

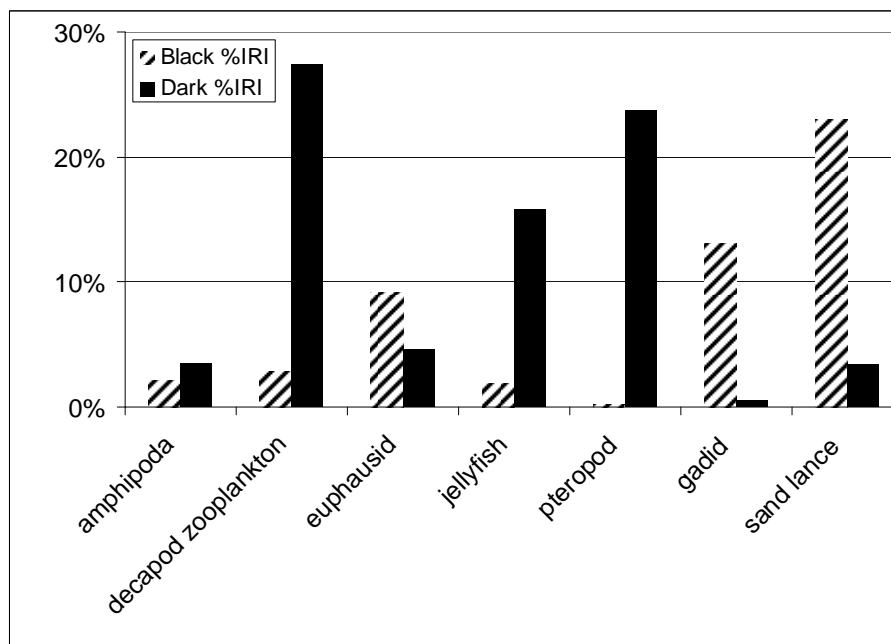


Figure 5 Percent Index of Relative Importance (a composite index based on frequency of occurrence, numbers consumed, and weight of prey items, Cortés 1997) for dark and black rockfish from the same area of the Shumagin Islands, August 2005.

3.1.1 Life history characteristics of *Sebastes* rockfish species

Life history characteristics for all *Sebastes* species include an egg stage completed within the female and a pelagic larval stage (Lunsford et al. 2005). Larval studies for dusky rockfish (the best studied of the species in the PSR complex) are hampered by a lack of genetic analyses thus post-larval dusky rockfish have not been identified but are assumed to be similar to other *Sebastes* species and hence to be pelagic. Information for dark rockfish is presumed to be similar to known information for dusky rockfish. The habitat of young juveniles is unknown but a demersal stage follows the pelagic stage as evidenced by the appearance of juveniles less than 25 cm fork length in bottom trawl surveys (Clausen et al. 2002). Older juveniles have been taken only infrequently in trawl surveys and then in inshore shallower waters than the adults (Lunsford et al. 2005). Limited food information for this species indicates that euphausiids are an important prey item for adult dusky rockfish (Yang 1993).

The size of dusky rockfish taken in the fishery generally appears to have increased after 1992; in particular, the mode increased from 42 cm in 1991-92 to 44-47 cm in 1993-97. The mode then decreased to 42 cm in 1998, and rose back to 45 cm in 1999-2002 (Lunsford et al. 2005). Age data from the fishery indicates a range of ages from 4-76 years (Lunsford et al. 2005). Age and length data from the Federal fishery data are only available for dusky rockfish.

Mortality rates and maximum age for pelagic shelf rockfish species are presented in Table 1. The estimates range from 0.06–0.09 and were based on dusky rockfish samples (Lunsford et al. 2005). A value of 0.09 has typically been used in stock assessments for pelagic shelf rockfish species because these species were typically younger than other long-lived rockfish (Lunsford et al. 2005). A value of 0.07 was recently computed for dark rockfish based upon a study completed in the GOA (Chilton. *In Review*). This study indicated a higher maximum age than had been previously assumed for dark rockfish. This value of 0.07 was utilized to compute ABCs and OFLs for dark, widow and yellowtail rockfish in the recent stock assessment for pelagic shelf rockfish (Lunsford et al. 2005).

Table 1 Instantaneous rate of natural mortality and maximum age for pelagic shelf rockfish, based on the break-and-burn method of aging otoliths. Area indicates location of study: Gulf of Alaska (GOA) or British Columbia (BC).

Species	Mortality Rate	Maximum Age	Area	Reference
Dusky Rockfish	0.09	59	GOA	1
	0.09	51 ^b	GOA	7
	0.08	59 ^c	GOA	5
	0.06	76	GOA	6
Dark Rockfish	0.07	75	GOA	2
Yellowtail Rockfish	0.07	53	BC	3
Widow Rockfish	0.05a	59	BC	4

^a Instantaneous rate of total mortality (Z).

^b Maximum survey age.

^c Maximum survey age.

References: (1) Clausen and Heifetz (1991); (2) Chilton, L. *In Review*. Growth and natural mortality of dark rockfish (*Sebastes ciliatus*) in the western Gulf of Alaska. 23rd. Lowell Wakefield Fisheries Symposium on Biology, Assessment, and Management of North Pacific Rockfishes; (3) Leaman and Nagtegaal (1987); (4) Chilton and Beamish (1982); (5) Malecha et al. (2004); (6) Calculated for this document using Hoenig (1983) ($-\ln(0.001)/t_m$); (7) back calculated maximum age using Hoenig (1983) ($-\ln(0.001)/M$).

Age and size of maturity for dark rockfish are currently under investigation. Limited age and length data are available from ADF&G for dark rockfish from dockside sampling efforts from the 2002-2004 black

rockfish commercial jig fishery from 1993–2006 and from black and dark rockfish surveys completed off Kodiak, Chignik, South Peninsula, and Eastern Aleutians from 2001–2006. Lengths of dark rockfish sampled range from 10–52 cm and 1–81 years old (ADF&G, unpublished data, Figure 6).

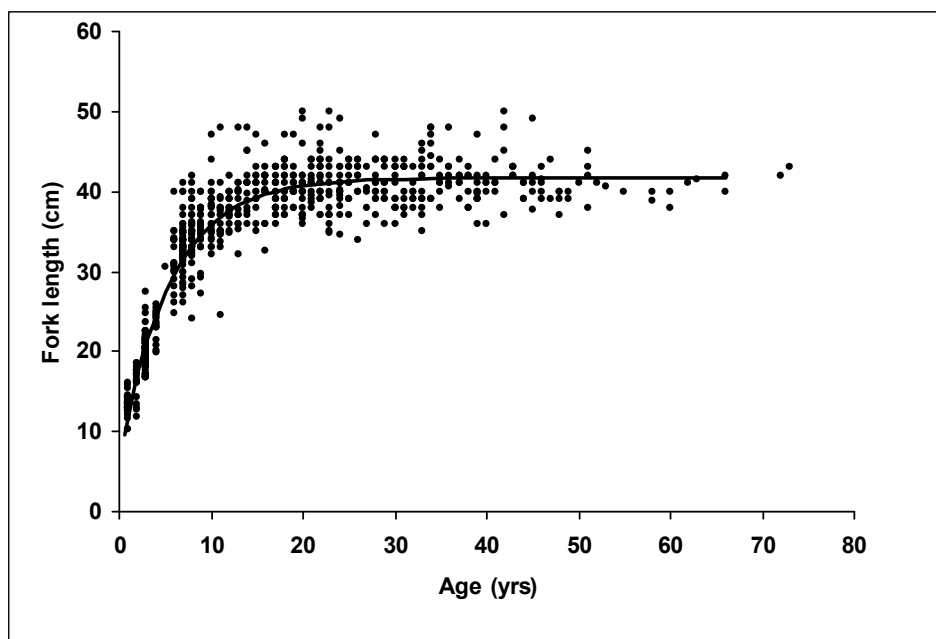


Figure 6 Age at length of male dark rockfish from Kodiak Island waters with a fitted von Bertalanffy growth curve ($\rho = 0.8363$, $k = 0.1787$, $L^\infty = 41.69$).

3.1.2 Biomass by species

3.1.2.1 GOA Pelagic Shelf rockfish complex

Dusky rockfish are the most abundant species in the pelagic shelf rockfish complex gulfwide. The remaining three species make up a small proportion of the complex. Biomass estimates from GOA trawl surveys from 1984–2005 are shown in Table 2. GOA trawl surveys were triennial until 1999 and biennial since that time. Starting in 1996 a distinction was made between “light” and “dark” dusky rockfish (and since 2005 they have been referred to by their now official names of dusky rockfish and dark rockfish). Data are presented through the most recent GOA trawl survey in 2005.

Biomass in all years is dominated by dusky rockfish. Biomass of dark, widow and yellowtail rockfish is patchy from one year to the next, with occasional single tows during the survey dominating the biomass estimate for that species. In 1999, dusky rockfish predominated, but a relatively large biomass of yellowtail rockfish was also seen in the Southeastern area. This yellowtail rockfish biomass can be mostly attributed to one relatively large catch in Dixon Entrance near the U.S./Canada boundary. In 2005, the dusky and dark rockfish biomass estimates were the highest ever recorded. The dark rockfish biomass was influenced by a large catch of 1,154 kg in the Shumagin area. The next largest catch of dark rockfish was 167 kg (Lunsford et al. 2005). With the exception of 2005 the relative contribution to the overall survey biomass from dark rockfish has been low. GOA rockfish trawl biomass estimates for all species from 1984–2005 are shown in Table 2 while estimates by individual species including standard errors from NMFS triennial/biennial trawl surveys in the Gulf of Alaska from 1996–2005 are shown in Table 2 through Table 6.

Table 2 Biomass estimates (mt) for species in the pelagic shelf rockfish complex in the Gulf of Alaska, based on results of bottom trawl surveys from 1984 through 2005 (Lunsford et al. 2005)

Species	Statistical Area					Total
	Shumagin	Chirikof	Kodiak	Yakutat	Southeastern	
1984						
Dusky rockfish	3,843	7,462	4,329	15,126	307	31,068
Yellowtail rockfish	0	0	0	17	454	471
Total, all species	3,843	7,462	4,329	15,143	761	31,539
1987						
Dusky rockfish	12,011	4,036	46,005	18,346	1,097	81,494
Widow rockfish	0	0	0	51	96	147
Total, all species	12,011	4,036	46,005	18,397	1,193	81,641
1990						
Dusky rockfish	2,963	1,233	16,779	5,808	953	27,735
Widow rockfish	0	0	0	285	0	285
Total, all species	2,963	1,233	16,779	6,093	953	28,020
1993						
Dusky rockfish	11,450	12,880	23,780	7,481	1,626	57,217
Total, all species	11,450	12,880	23,780	7,481	1,626	57,217
1996						
Light dusky rockfish	3,553	19,217	36,037	14,193	1,480	74,480
Dark dusky rockfish	152	139	59	0	0	350
Widow rockfish	0	10	0	0	919	929
Yellowtail rockfish	0	0	20	0	65	85
Total, all species	3,704	19,366	36,116	14,193	2,464	75,843
1999						
Light dusky rockfish	2,538	9,157	33,729	2,097	2,108	49,628
Dark dusky rockfish	2,130	31	49	0	0	2,211
Widow rockfish	0	0	69	0	115	184
Yellowtail rockfish	0	0	0	162	12,509	12,671
Total, all species	4,668	9,188	33,847	2,259	14,732	64,694
2001						
Light dusky rockfish	5,352	2,062	23,590	7,924 ^a	1,738 ^a	40,667 ^a
Dark dusky rockfish	362	15	36	0 ^a	0 ^a	413 ^a
Widow rockfish	0	0	0	0 ^a	345 ^a	345 ^a
Yellowtail rockfish	0	0	0	54 ^a	4,192 ^a	4,245 ^a
Total, all species	5,714	2,077	23,626	7,978 ^a	6,275 ^a	45,670 ^a
2003						
Light dusky rockfish	4,039	46,729	7,198	11,519	1,377	70,862
Dark dusky rockfish	235	49	16	0	0	300
Widow rockfish	0	0	0	0	32	32
Yellowtail rockfish	0	0	0	71	635	705
Total, all species	4,274	46,778	7,214	11,590	2,044	71,899
2005						
Dusky rockfish	69,295	38,216	60,097	2,488	389	170,484
Dark rockfish	21,454	389	2,348	0	0	24,191
Widow rockfish	0	0	51	0	77	128
Yellowtail rockfish	0	0	0	0	1,121	1,121
Total, all species	90,749	38,605	62,445	2,448	1,587	195,924

^aNote: The Yakutat and Southeastern areas were not sampled in the 2001 survey. Estimates of biomass for these two areas in 2001 were obtained by averaging the corresponding area biomasses in the 1993, 1996, and 1999 surveys.

Table 3 Dusky Rockfish biomass estimates and standard errors from NMFS triennial/biennial trawl surveys in the Gulf of Alaska from 1996-2005 (from 2005 SAFE report, NPFMC 2005)

Year	<u>1996</u>	<u>1999</u>	<u>2001</u>	<u>2003</u>	<u>2005</u>
Biomass	74,480	49,540	41,905	70,862	170,484
S.E.	32,851	19,193	11,634	34,352	51,657
LCI	8,778	11,154	18,637	2,158	68,202
UCI	140,182	87,926	65,173	139,566	272,766

Table 4 Dark rockfish biomass estimates and standard errors from NMFS triennial/biennial trawl surveys in the Gulf of Alaska from 1996-2005.

Year	<u>1996</u>	<u>1999</u>	<u>2001</u>	<u>2003</u>	<u>2005</u>
Biomass	350	2,211	413	299	24,191
S.E.	169	2,002	343	160	19,052
LCI	17	-1,712	-259	-15	-13,151
UCI	682	6,134	1,085	614	61,533

Table 5 Widow rockfish biomass estimates and standard errors from NMFS triennial/biennial trawl surveys in the Gulf of Alaska from 1996-2005.

Year	<u>1996</u>	<u>1999</u>	<u>2001</u>	<u>2003</u>	<u>2005</u>
Biomass	929	184	345	32	128
S.E.	906	116	526	22	73
LCI	-848	-44	-686	-12	-14
UCI	2,705	412	1,375	76	270

Table 6 Yellowtail rockfish biomass estimates and standard errors from NMFS triennial/biennial trawl surveys in the Gulf of Alaska from 1996-2005.

Year	<u>1996</u>	<u>1999</u>	<u>2001</u>	<u>2003</u>	<u>2005</u>
Biomass	85	12,671	4,245	705	1,121
S.E.	53	11,561	6,675	483	851
LCI	-19	-9,989	-8,838	-242	-547
UCI	189	35,331	17,328	1,653	2,790

The relative contribution of dark rockfish to the overall PSR complex survey biomass from 1996–2005 survey years is shown in Table 7. Here 2005 represents the highest percent contribution to the overall survey biomass estimate for the complex since the species was individually identified beginning in 1996.

Table 7 Contribution of dark rockfish survey biomass to overall PSR survey biomass estimate

Year	% Survey Biomass
1996	0.46
1999	3.42
2001*	0.90
2003	0.42
2005	12.35

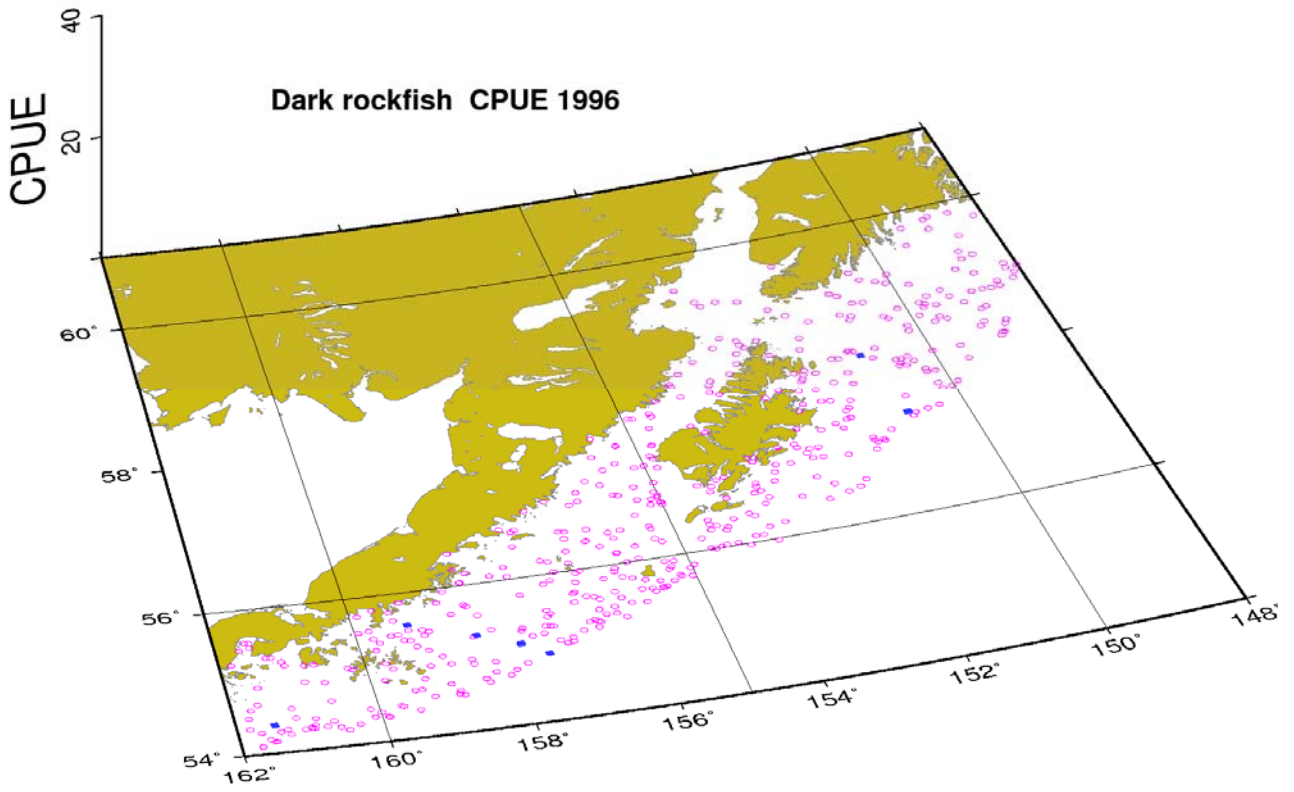
*Note the 2001 survey did not cover the eastern GOA

Trawl survey data shows locations by species in the pelagic shelf rockfish complex observed in the Gulf of Alaska since 1996. Dark rockfish shows high biomass in selected tows in the Shumagin area in 1999 (Figure 7a) and 2005 (Figure 7e). Trawl survey data also shows selected high tows east and southeast of Kodiak (Figure 7e). The large survey haul in 2005 which raised concerns about the offshore distribution of dark rockfish is an outlier for several reasons. First, though offshore, the haul was taken in depths of just over 100 meters, and in close proximity to a reported 6 fathom pinnacle. The species composition of this haul included other nearshore species such as yelloweye rockfish and kelp greenling. In submarine dives on a shallow pinnacle near Albatross Bank, a diverse mixture of species were found along steep terrain including yelloweye rockfish, dusky rockfish, and *black* rockfish (D. Hanselman pers. comm.). The sex ratio of the fish identified as dark rockfish were significantly different than the sex ratio of the overall catches of dark rockfish from 1996-2005 and much closer to that of black rockfish (Figure 8). The preponderance of males warranted examining the comparative length distributions of males from each species. The mean length of males in combined survey catches was 38 cm and 44 cm for dark and black rockfish respectively. The mean length of males in this haul was 41 cm, in between the two species. However, Chilton et al. (*in press*) reported an L_{∞} of 39 cm for male dark rockfish in a study of 281 male dark rockfish near Kodiak. Therefore, this particular haul should be viewed skeptically as representative of an offshore distribution, due to both its unique location and perhaps questionable identification of species.

Dusky rockfish trawl survey data shows consistent high tows albeit patchily distributed from one survey to the next (Figure 7a-e). The 2005 survey showed the highest biomass of dusky rockfish since the survey has been conducted (Lunsford et al. 2005).

Survey biomass data for widow and yellowtail rockfish are shown for the 1984-2005 survey years (Figure 10a-i and Figure 11a-i). Widow rockfish data showed only one high biomass tow in 1996 in the southeast leading to a biomass estimate in that area of >900 mt. Yellowtail rockfish showed higher biomass tows in southeast in 1984, 1996, and 2005 (Figure 11a-i). The high survey biomass estimate for yellowtail rockfish in 1999 was attributed to one relatively large catch in the Dixon entrance area (Figure 11f).

7a.



7b.

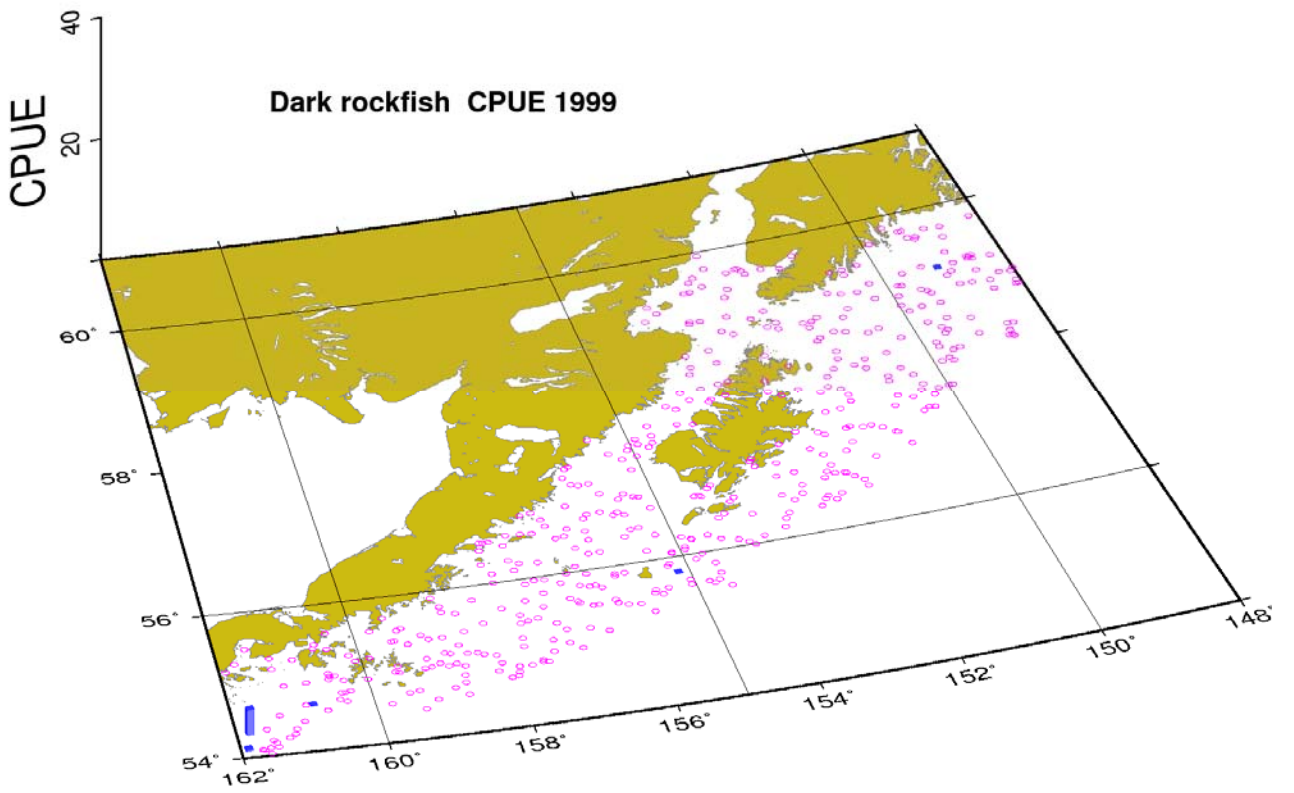
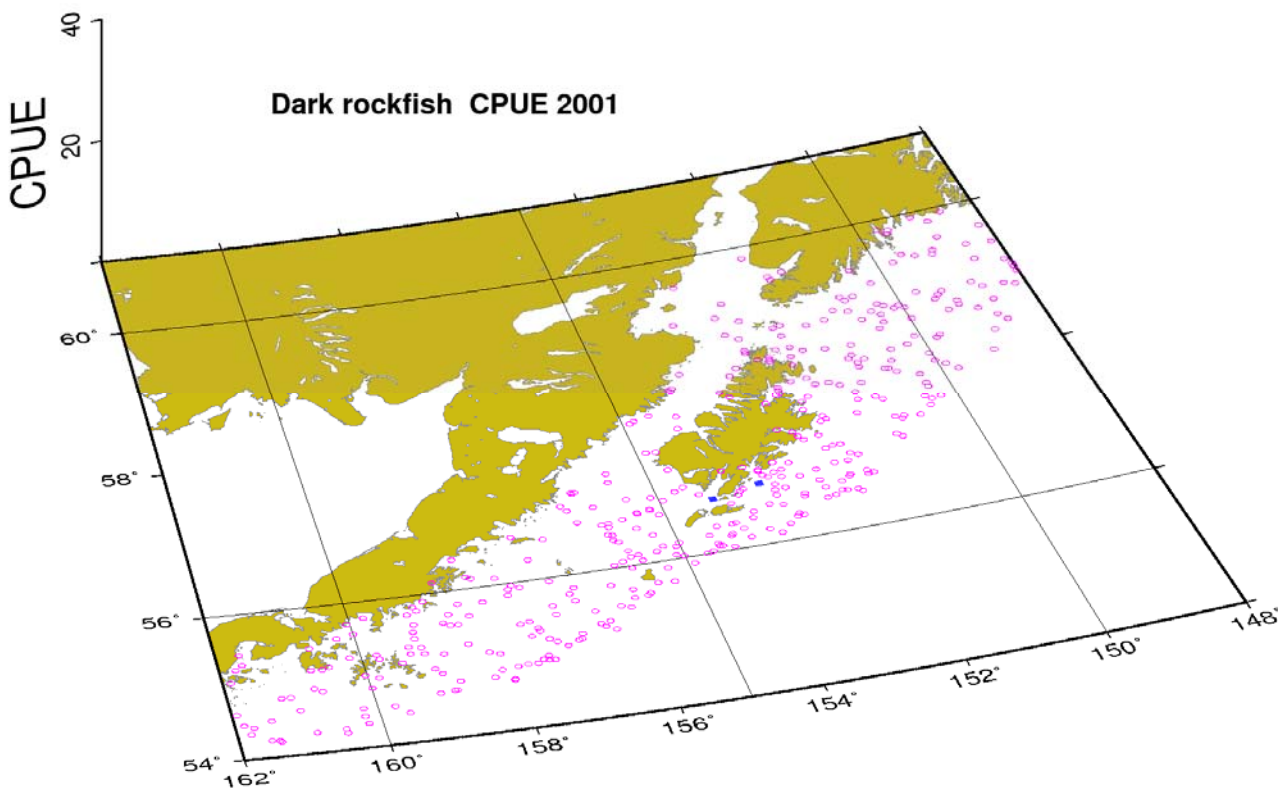


Figure 7 Dark rockfish CPUE from survey 1999-2005.

7c.



7d.

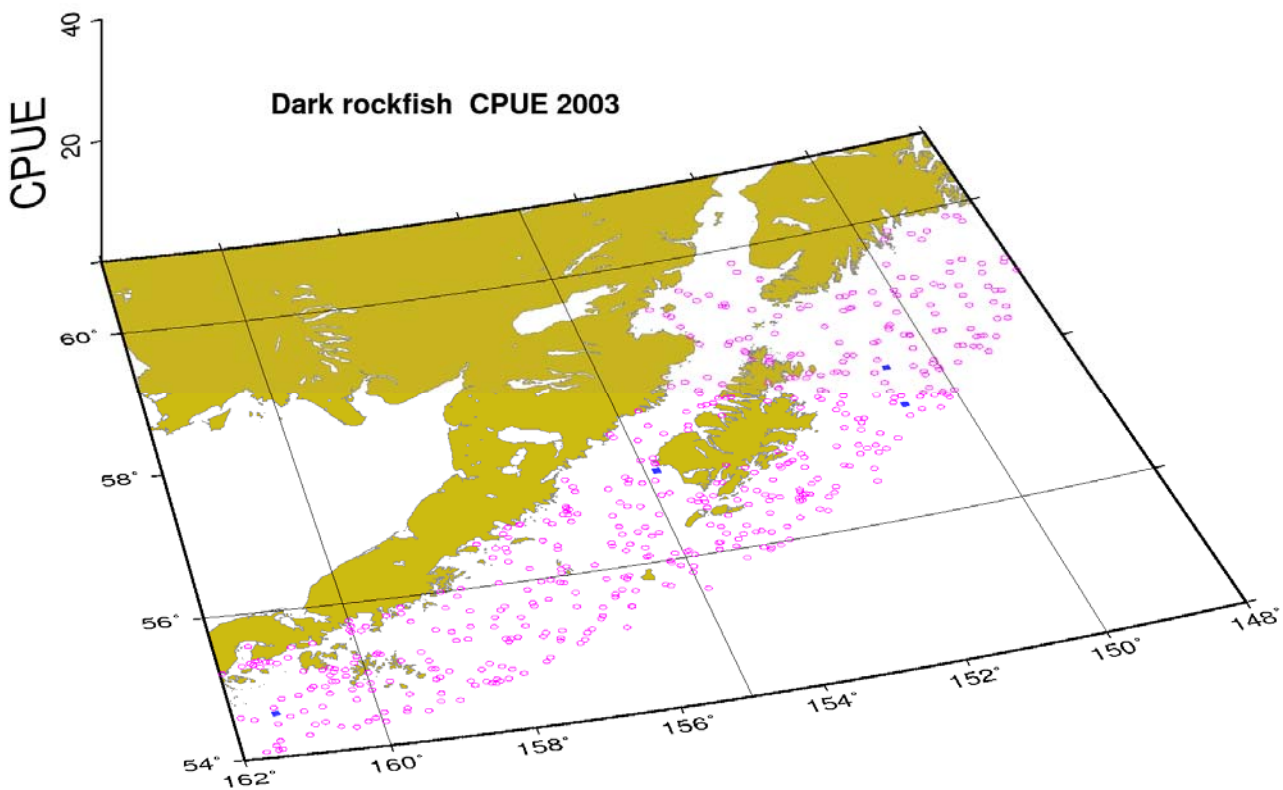


Figure 7 continued.

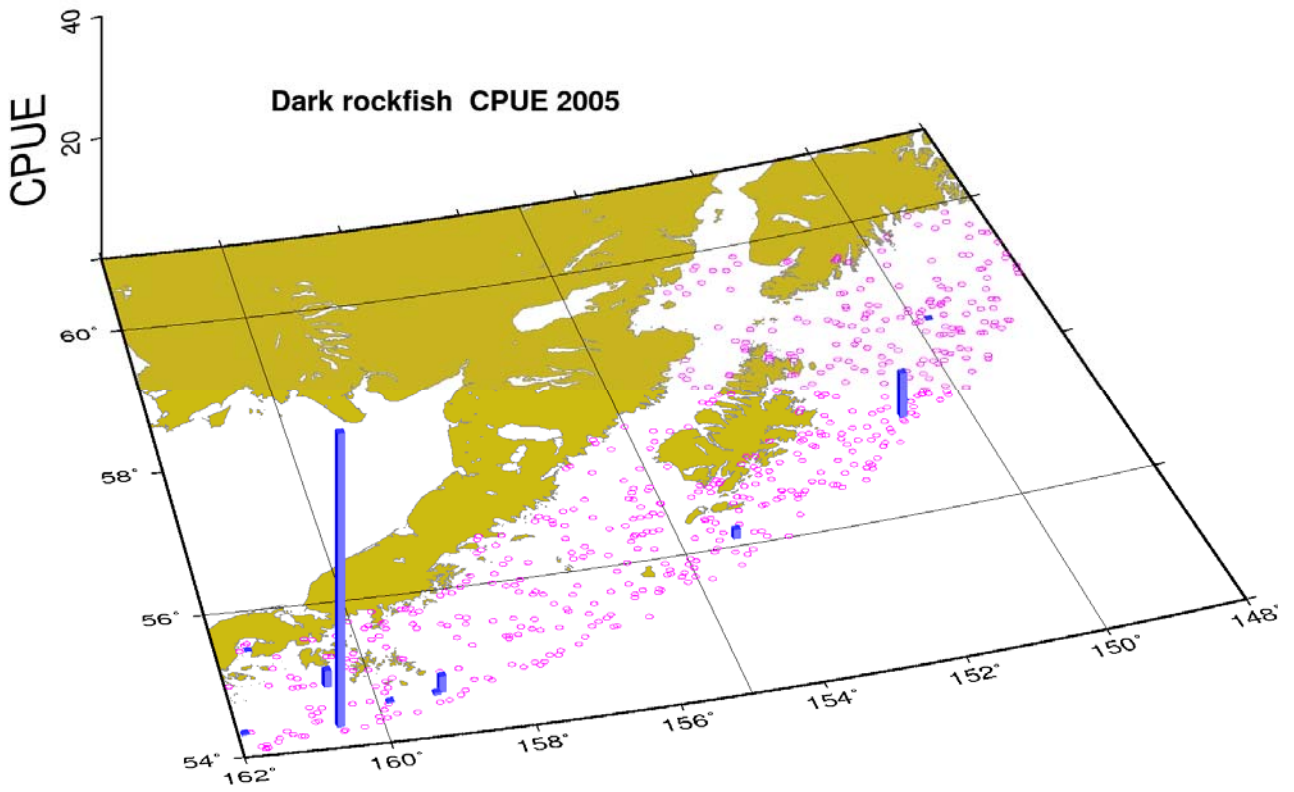


Figure 7 continued.

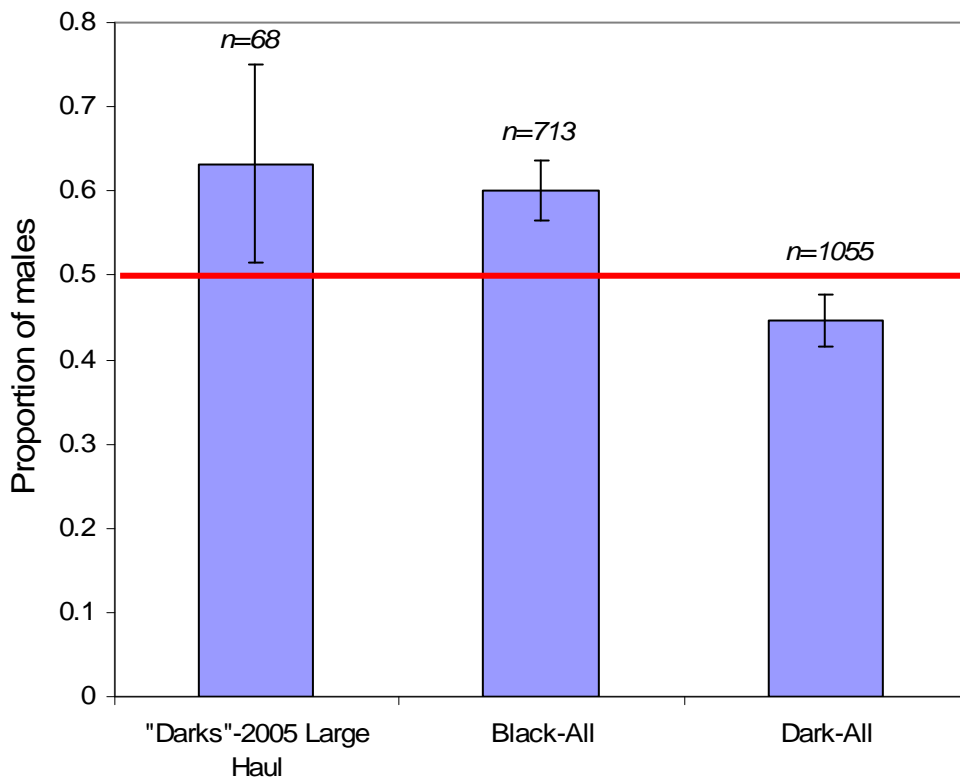
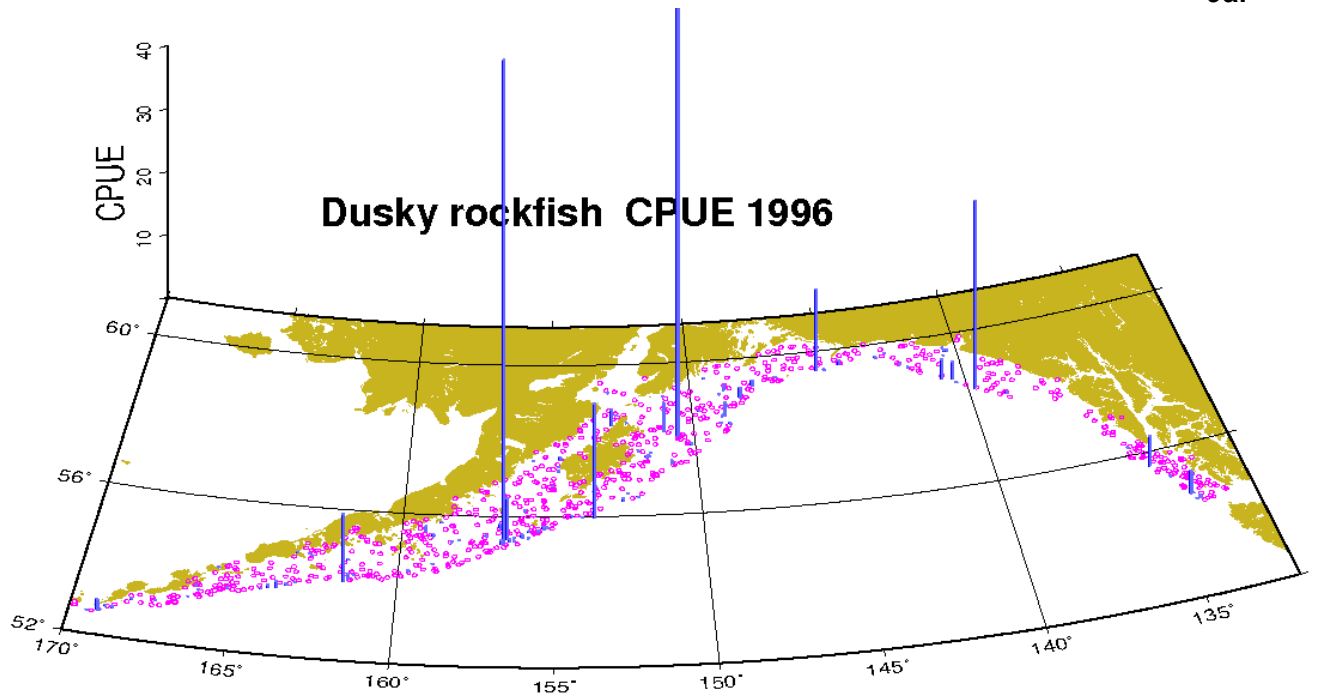


Figure 8 Comparison of sex-ratio for fish identified as dark rockfish in large 1154 kg haul near Shumagin Islands in 2005 with all lengths for black and dark rockfish in the NMFS trawl survey database.

9a.



9b.

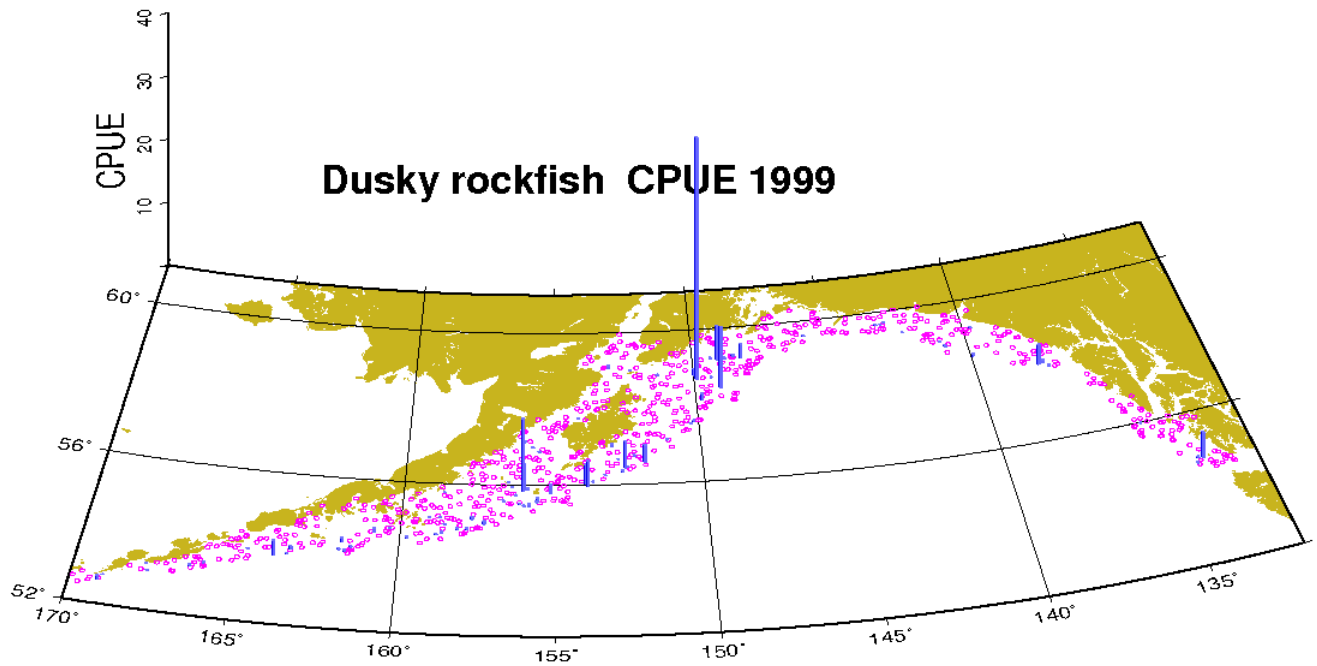
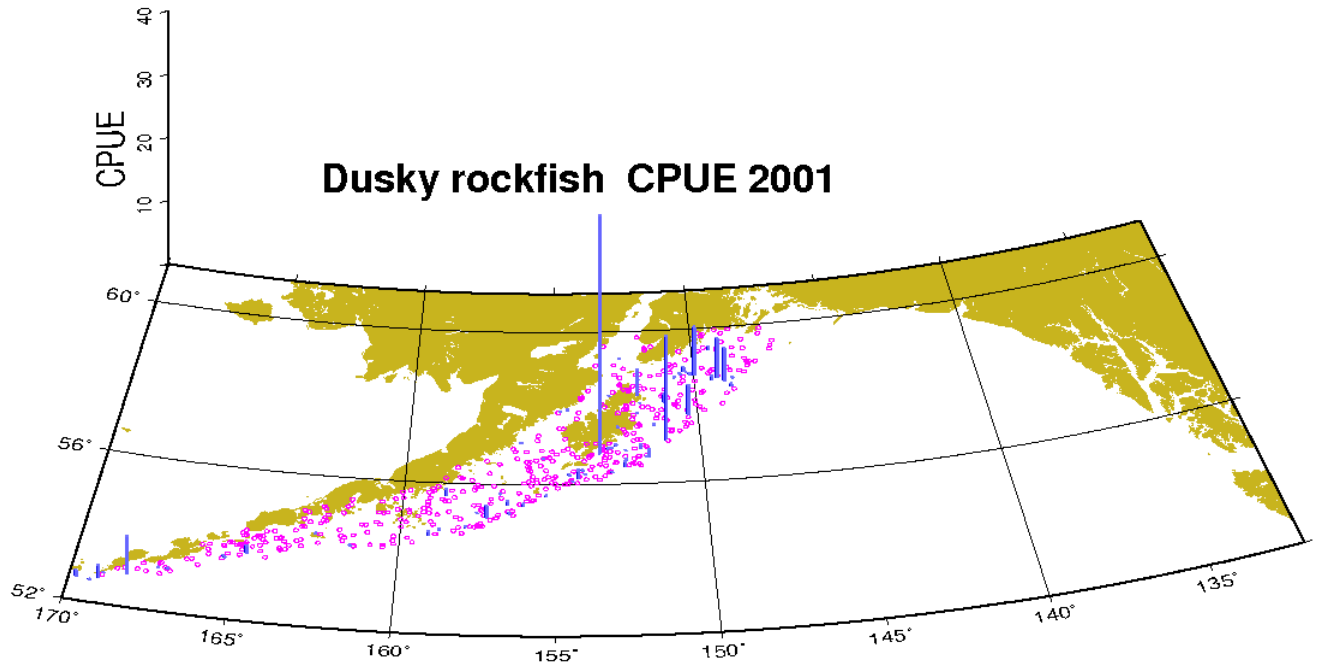


Figure 9 Dusky rockfish survey catch per unit effort (CPUE), survey years 1996-2003

9c.



9d.

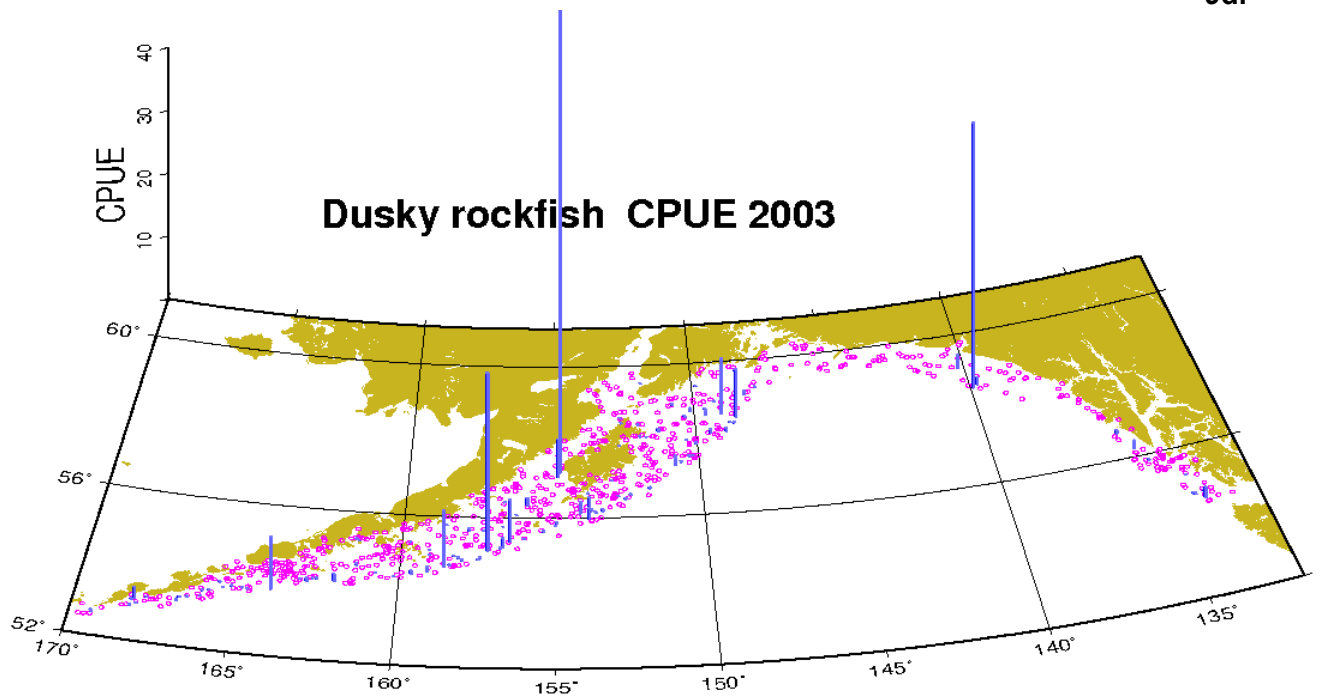


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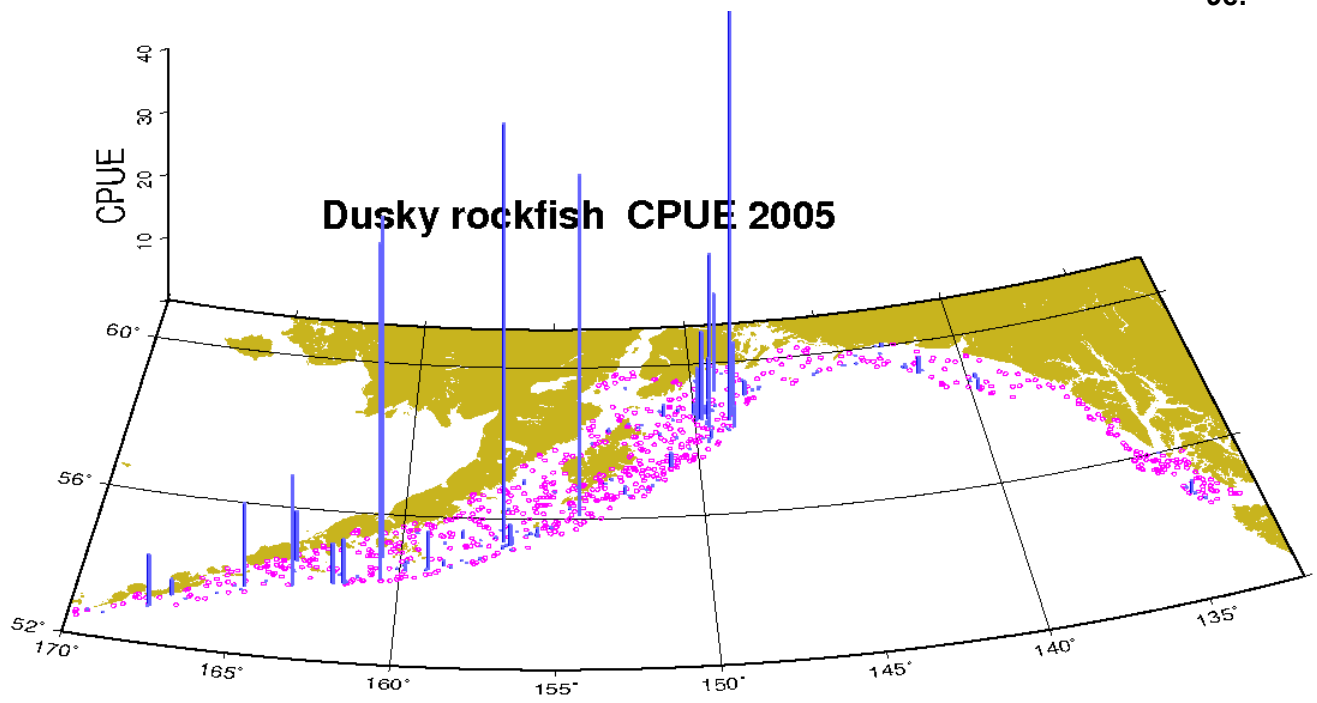
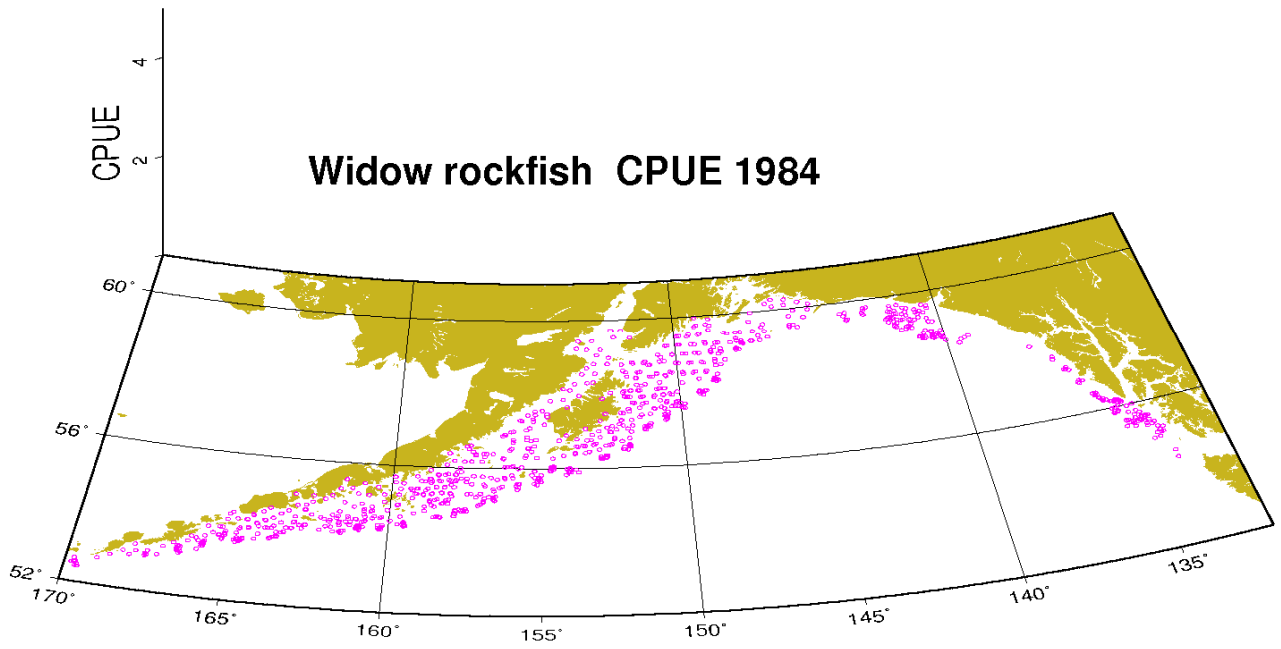


Figure 9 continued

10a.



10b.

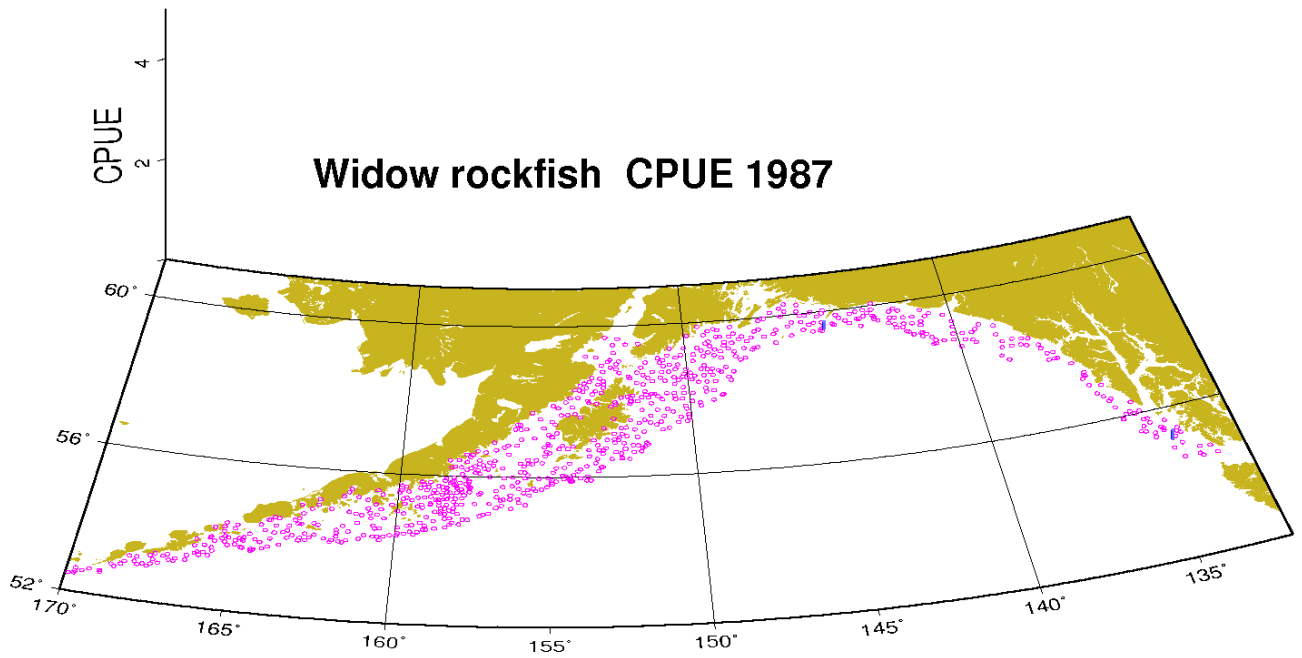
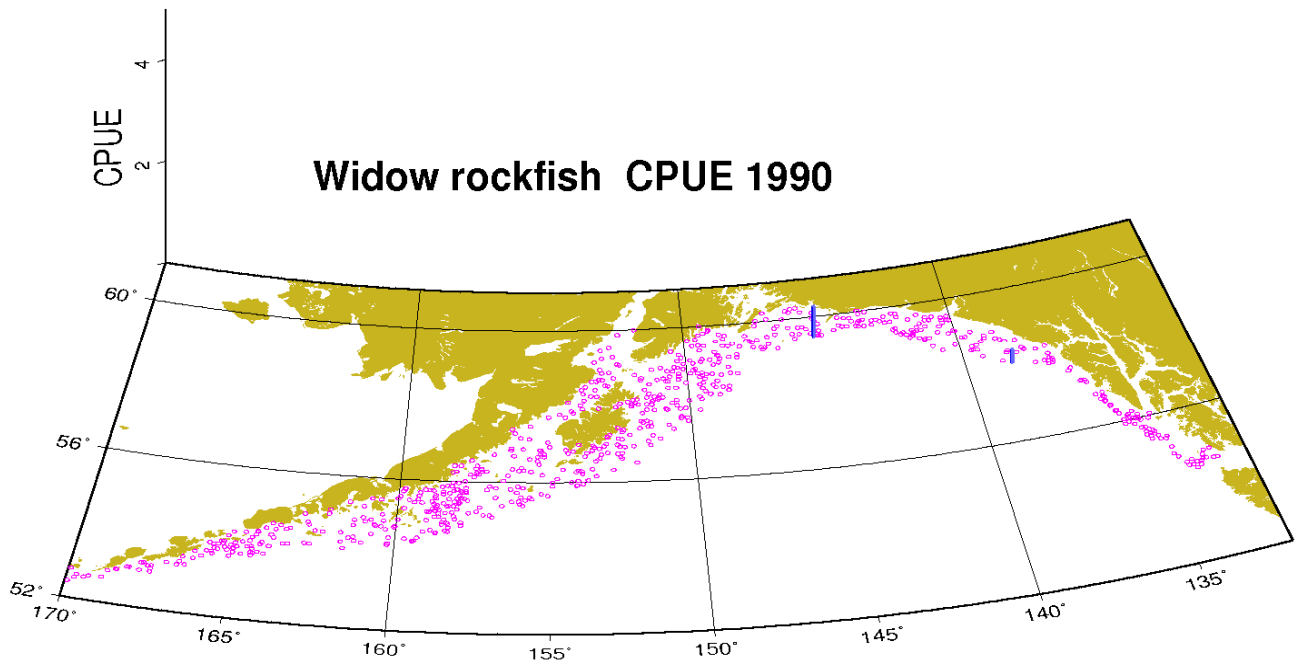


Figure 10 Widow rockfish survey catch per unit effort (CPUE), survey years 1984-2005

10c.



10d.

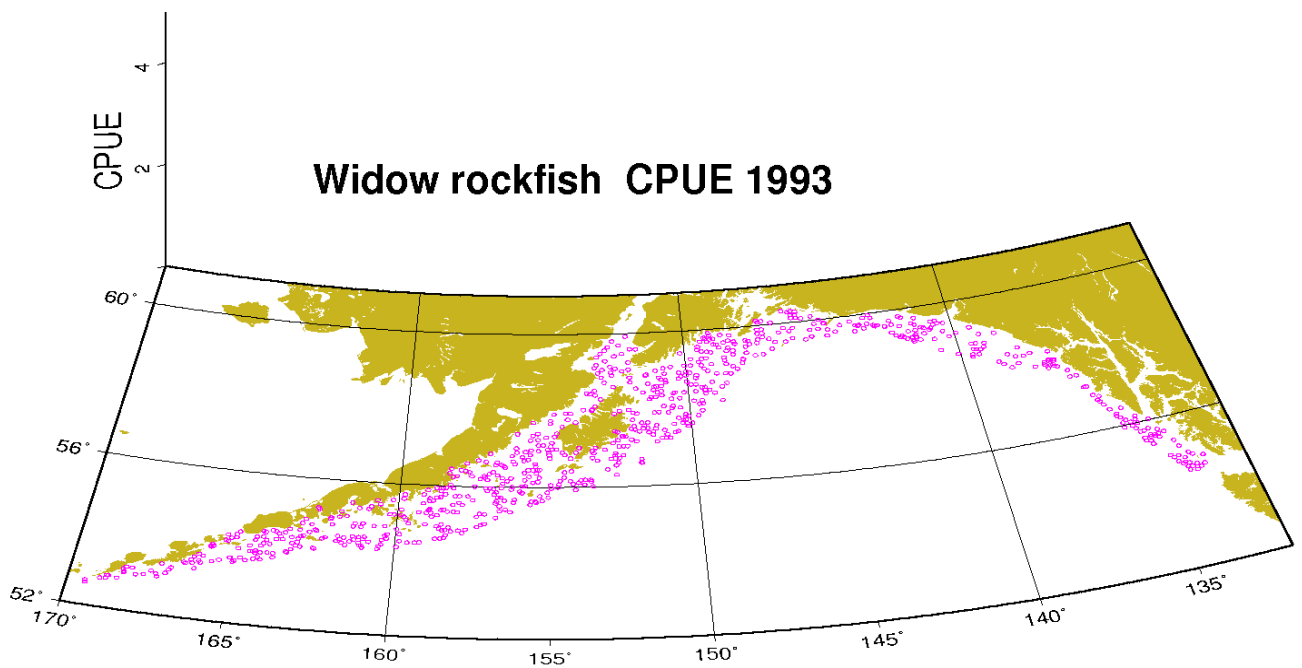
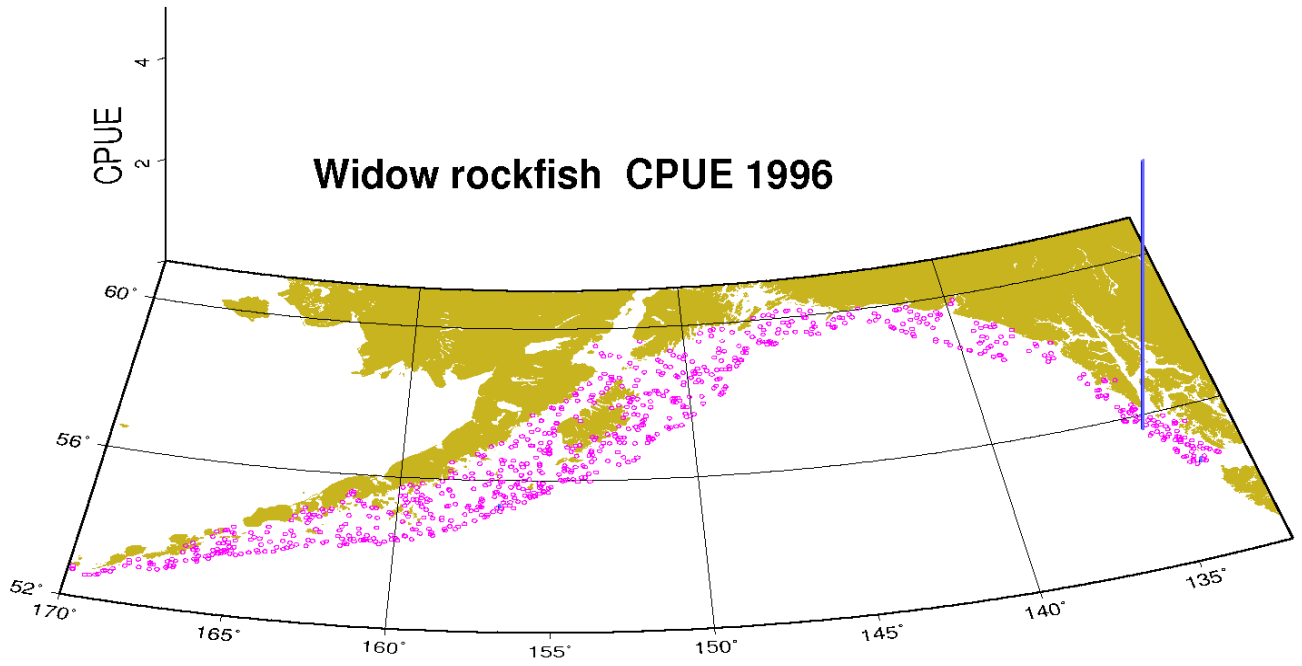


Figure 10 continued

10e.



10f.

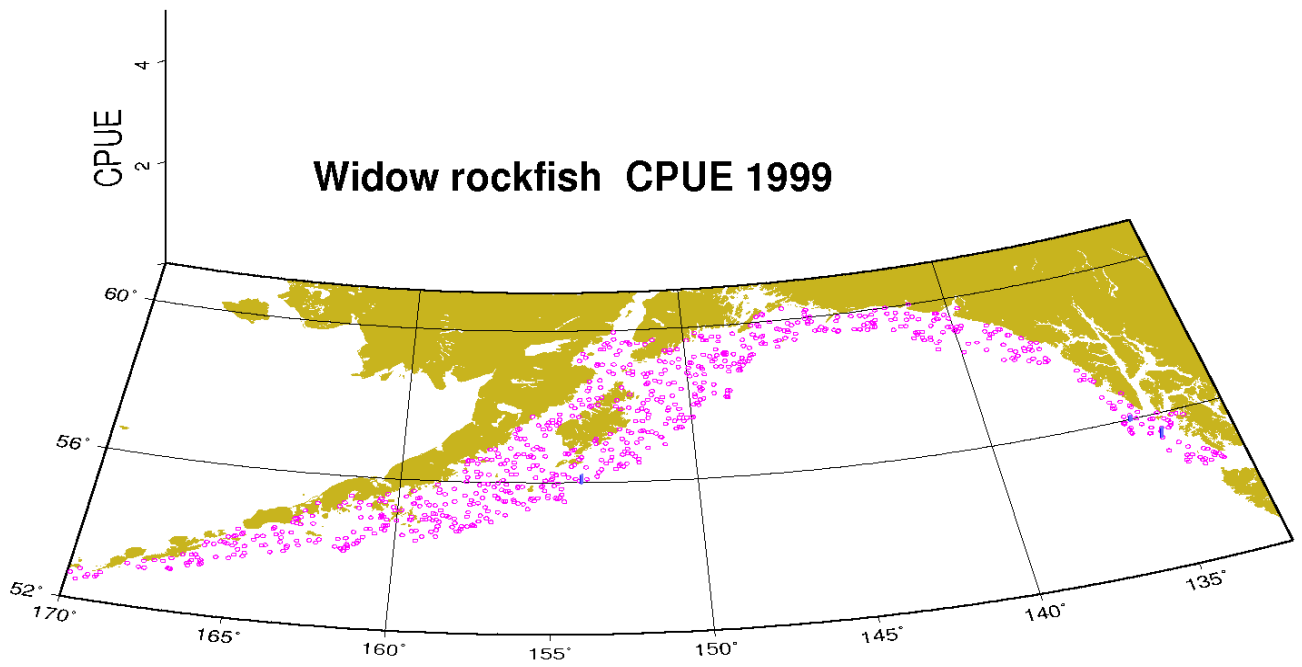
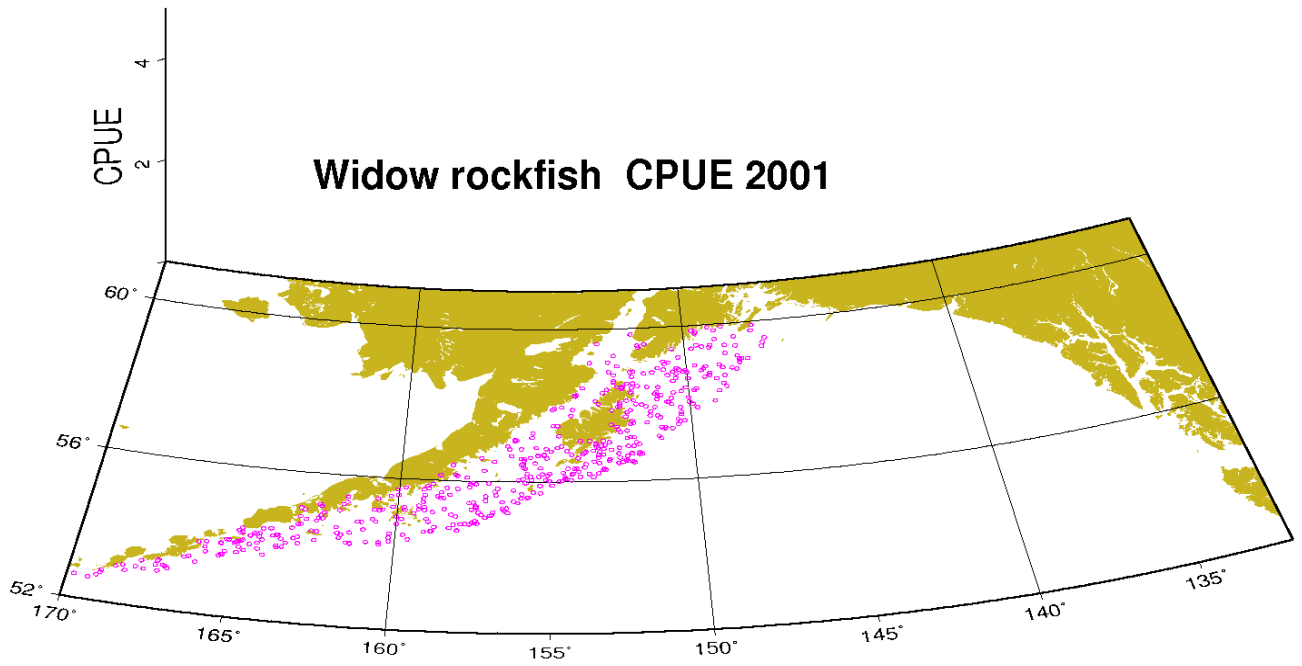


Figure 10 continued

10g.



10h.

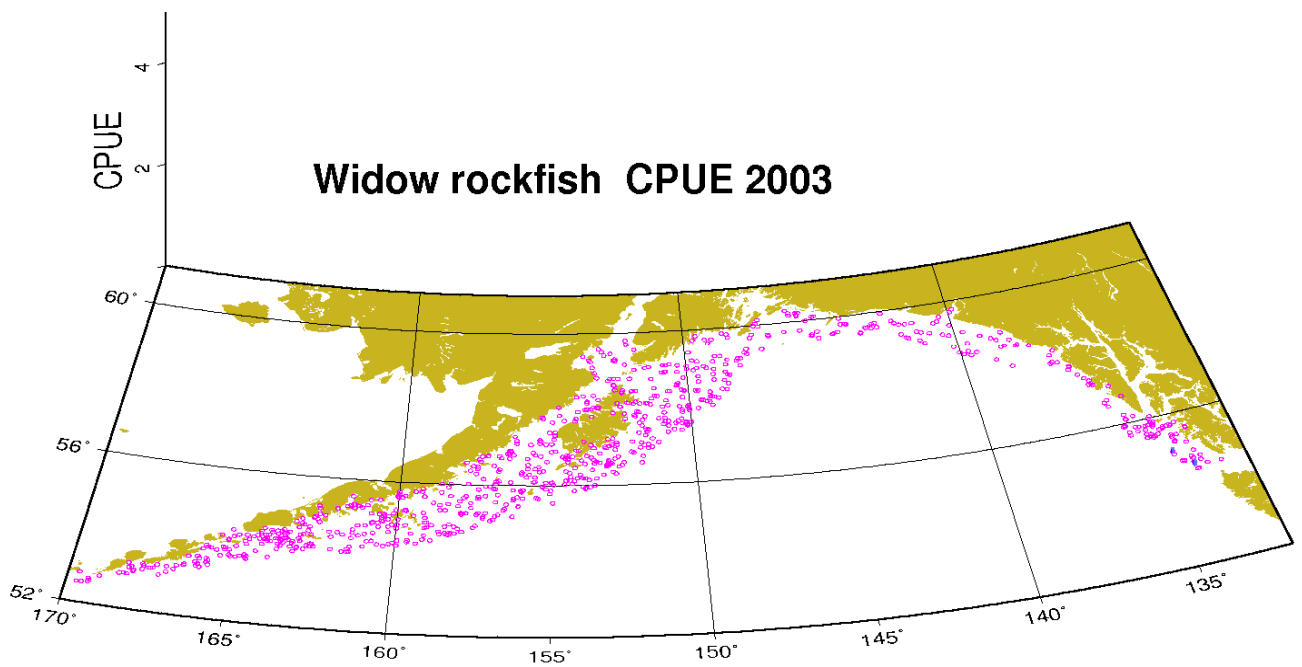


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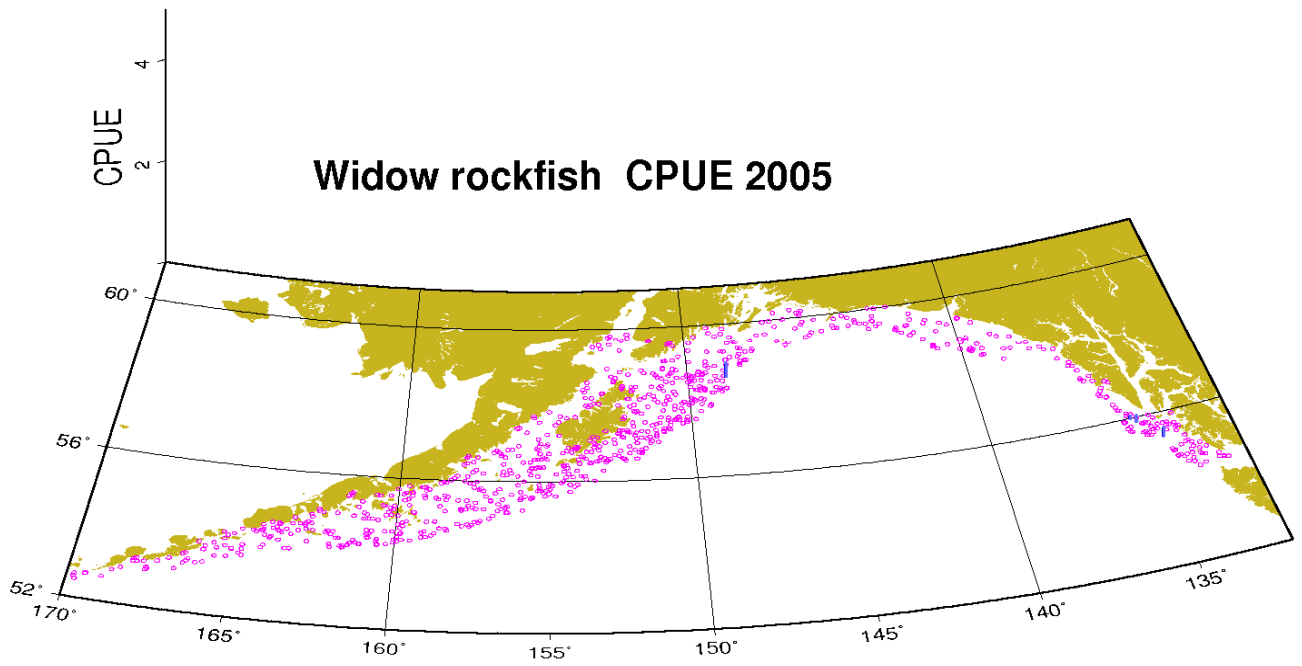
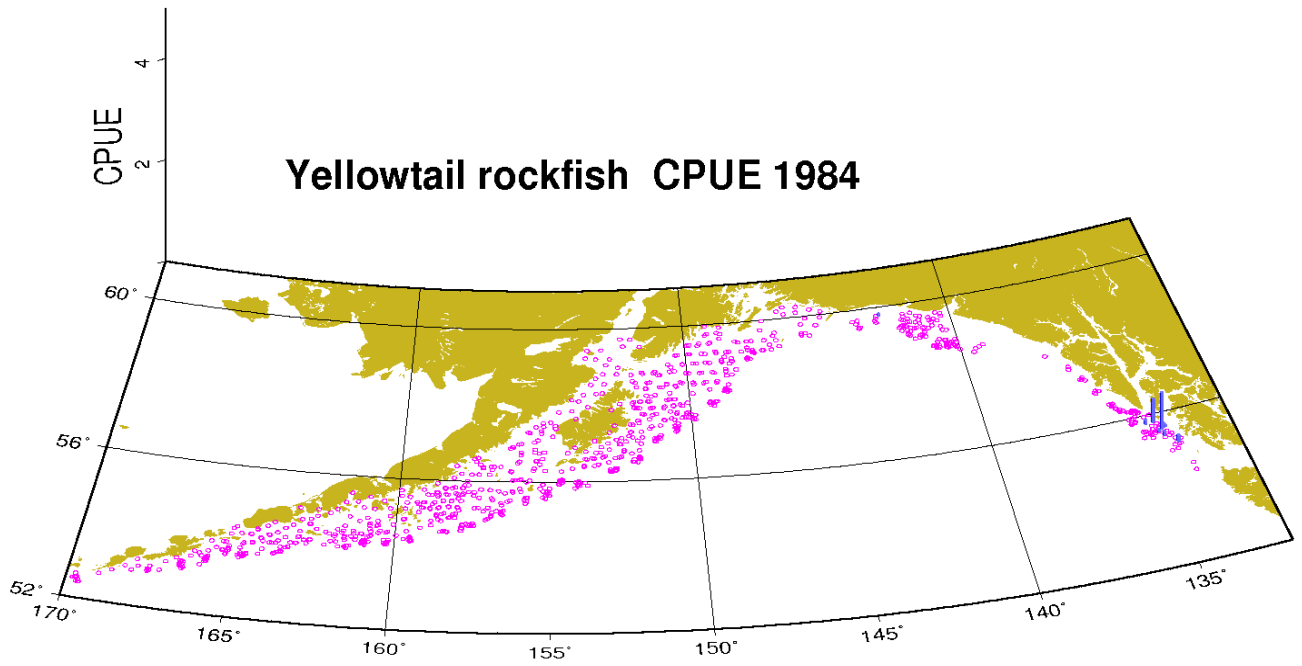


Figure 10 continued

11a.



11b.

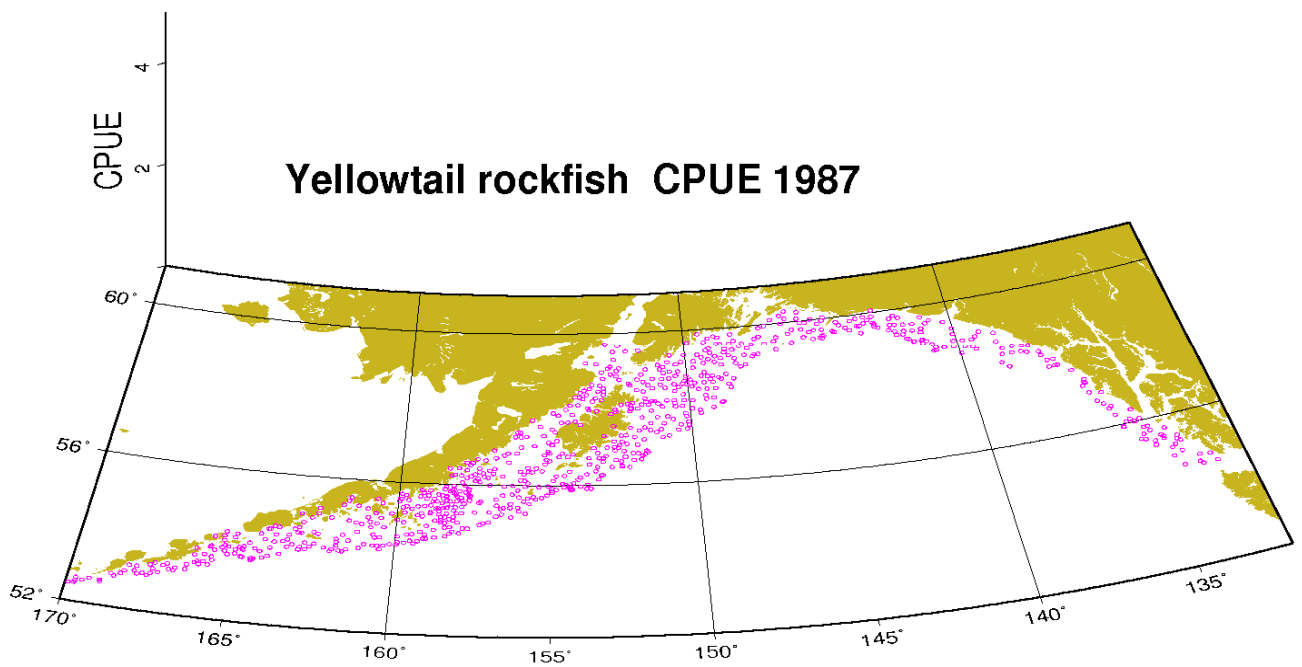
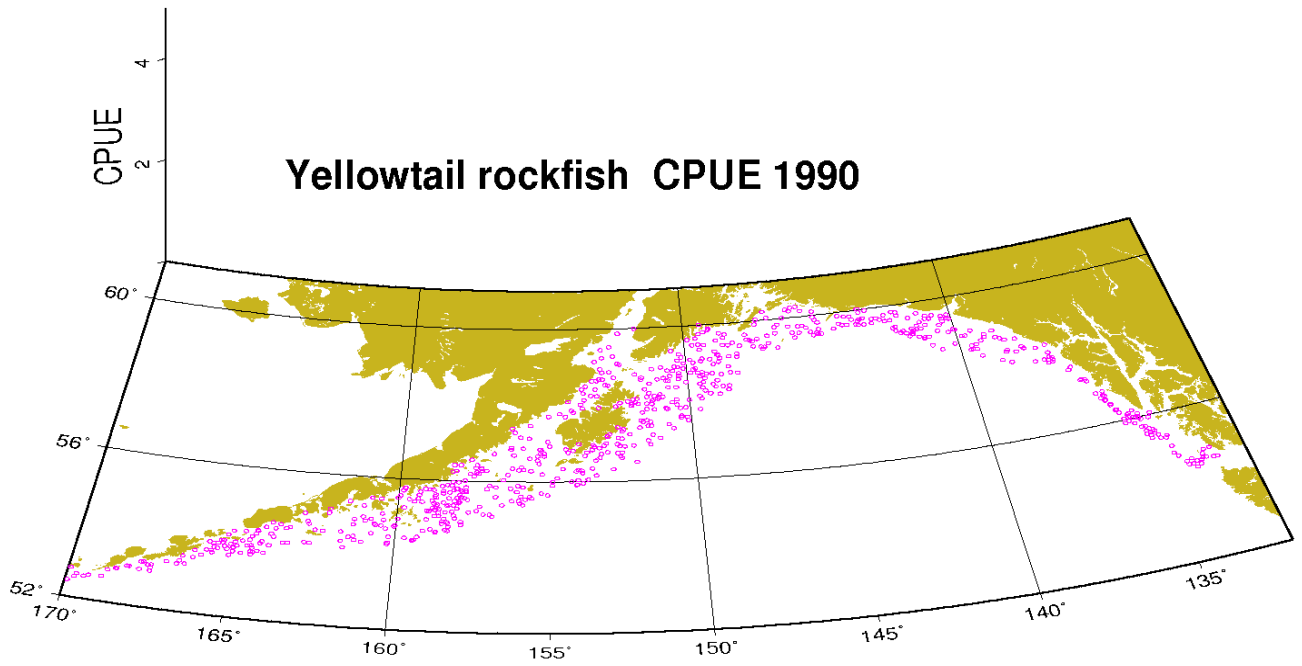


Figure 11 Yellowtail rockfish survey catch per unit effort (CPUE) trawl surveys 1984-2005

11c.



11d.

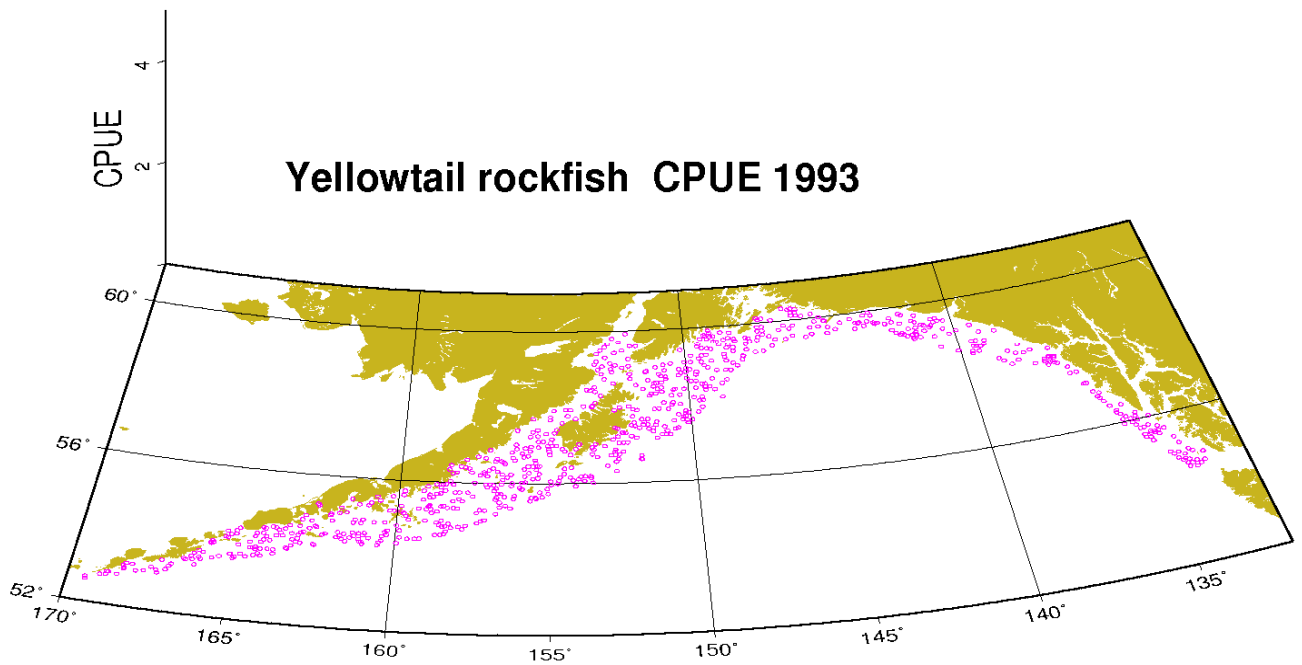
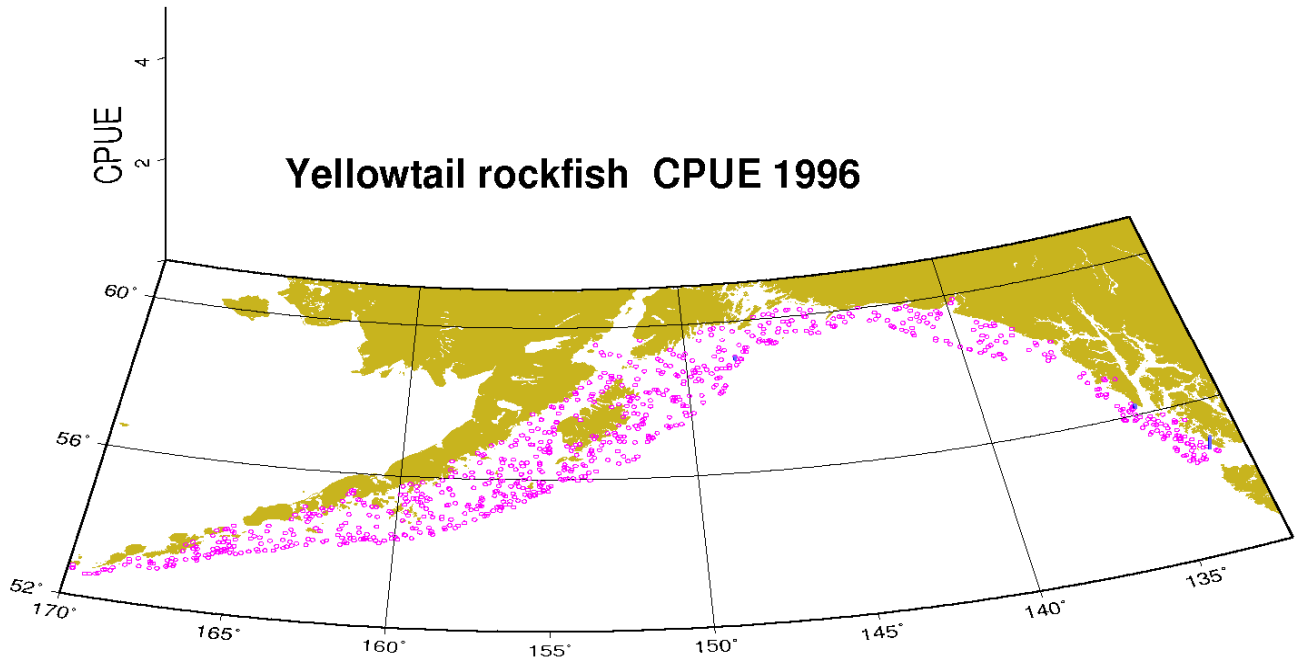


Figure 11 continued

11e.



11f.

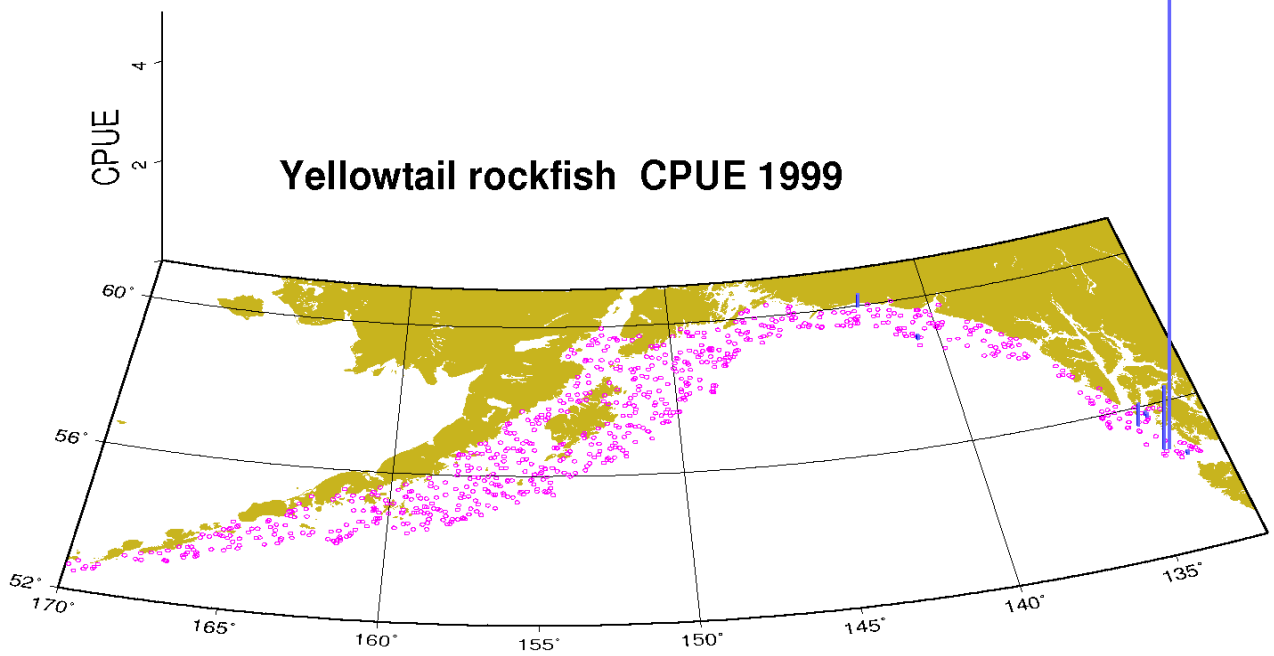
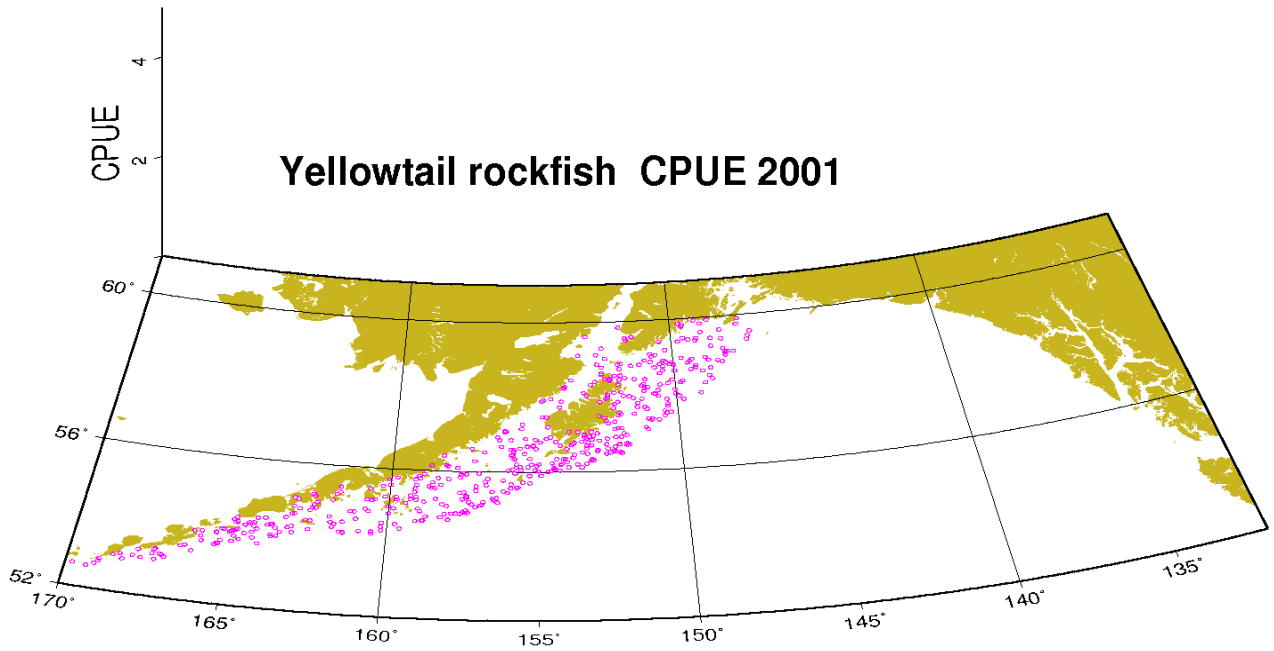


Figure 11 continued

11g.



11h.

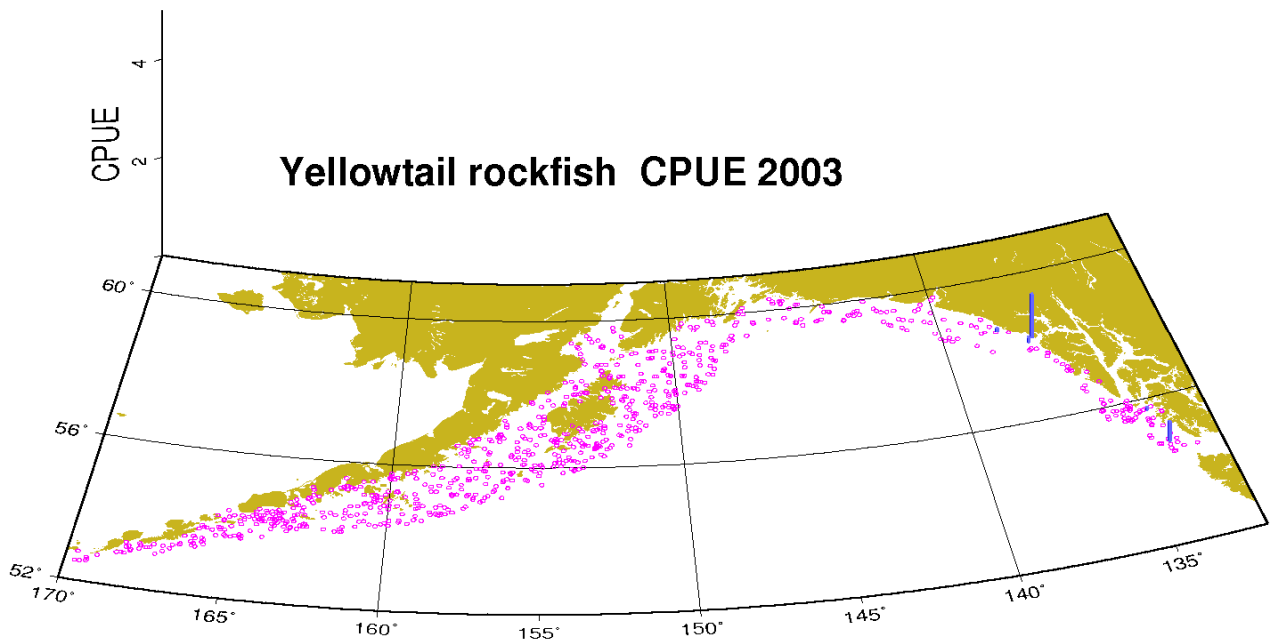


Figure 11 continued

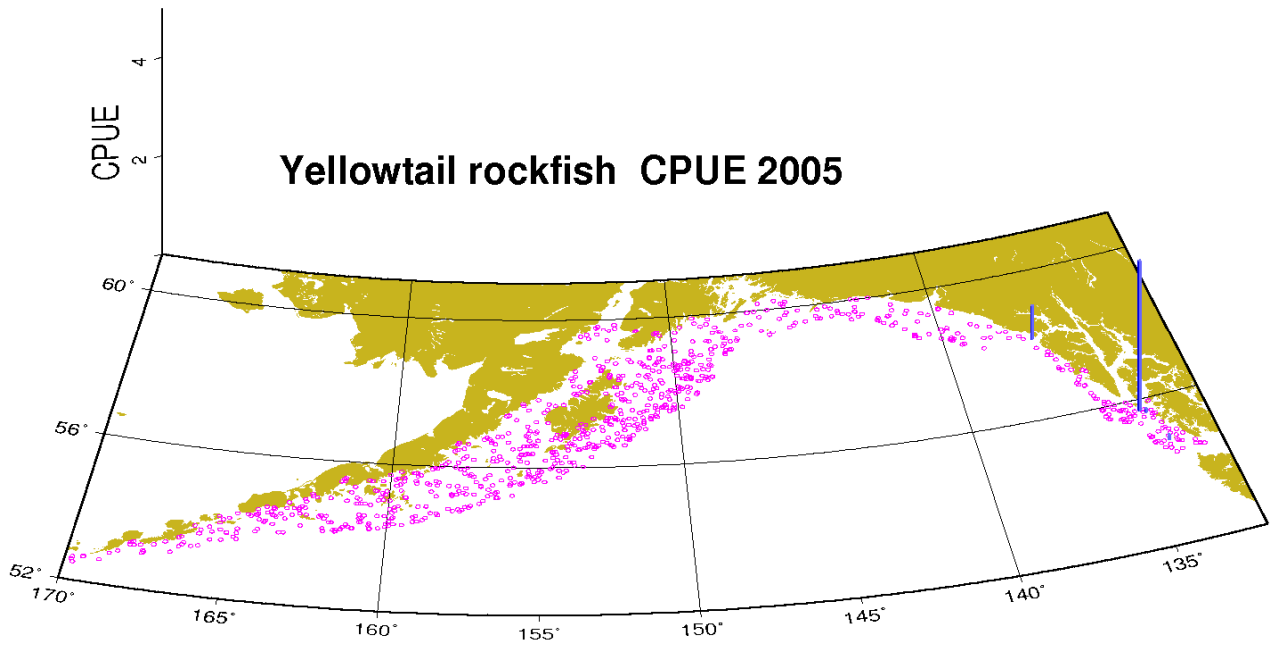


Figure 11 continued

Both widow and yellowtail rockfish species are patchily distributed and occasionally encountered in nearshore areas, shown by GOA bottom trawl survey catches of yellowtail in 1999 and of widow in 1996. These species make up a small percentage overall of the survey biomass in the PSR complex. Unlike dark rockfish, however, they are not recommended for removal to State management at this time.

In contrast to dark rockfish, widow and yellowtail rockfish tend to have the bulk of their distribution in offshore areas, despite occasional high CPUE in sporadic tows nearshore throughout the survey. While these species can be found nearshore, they are not believed to be a true nearshore species as with dark rockfish and black rockfish. For example, Allen and Smith (1988) say that over their entire range the most common occurrence of yellowtail is on the outer shelf between 100 and 150 meters and of widow on the outer shelf between 150m and 200m. Love (2002) says yellowtails migrate into deeper water as they mature but in the more northern part of their range they are occasionally found in kelp beds. Widow rockfish are most abundant from British Columbia to northern California and yellowtail rockfish are found from about southeast Alaska to central California (Love, 2002).

In the GOA, both species are likely at the northern extent of their range of distribution and have limited abundance in the areas surveyed by the bottom trawl survey (C. Lunsford, pers comm.). These species are more common in the pelagic shelf region further south, such as in British Columbia where trawl fisheries have existed historically for both species. Widow rockfish are an important component of the rockfish catch in offshore trawl fisheries in British Columbia (DFO 1999a). Yellowtail rockfish are also caught in conjunction with widow rockfish as both species tend to favor high relief bottom substrate near the edge of the continental shelf (DFO, 1999b). Commercial catches in B.C. tend to be made in depths of 100-200 meters for both species (DFO, 1999a,b).

In the GOA PSR complex, both yellowtail and widow rockfish are minor components of the overall complex biomass. Moving yellowtail and widow rockfish to State management along with dark rockfish does not seem logical given the combination of their tendency for offshore distribution as well as potentially being at the northern extent of their range of distribution in the GOA. However, both species would be likely candidates for alternative management measures such as those under consideration by the Council's non-target species initiative. The goal of non-target management is to protect incidentally-caught species from fishing effects. Management options would include prohibiting directed fishing and Maximum Retainable Allowances (MRAs). This initiative is a long-term effort under consideration by the Council. Yellowtail and widow rockfish as minor components of the PSR complex in the GOA, may be considered for these alternative management measures in the future.

Further analysis of trawl survey data for the GOA is included in order to investigate the relative prevalence of dark rockfish amongst rockfish species sampled as well as their habitat preference. Figure 12 shows the weight of dark rockfish found in survey hauls by bins. Large hauls of dark rockfish are extremely uncommon, with more than half of the hauls which catch dark rockfish containing less than 5 kg.

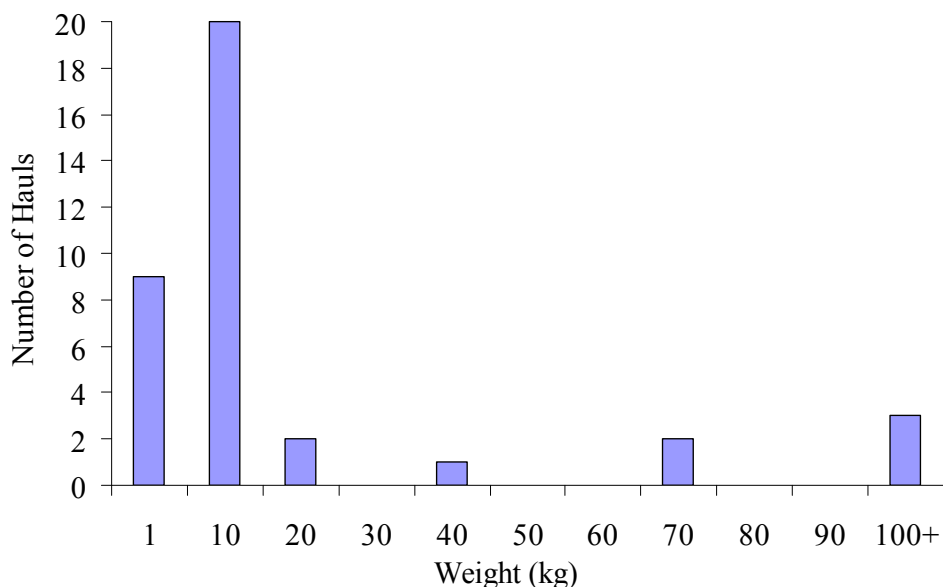


Figure 12 GOA Dark rockfish catch in survey hauls by weight (kg) 1996-2005. The 100+ group includes two haul catches (167 kg and 1154 kg).

Table 8 shows the relative weight (minimum and maximum) of dark rockfish in surveyed tows. Other than the single tow in 2005 with a maximum weight of 1154 kg, the maximum weight over the time period was 94 kg in 1999 (Table 8). The number of hauls in which dark rockfish were identified is quite low (Table 8).

Table 8 Dark rockfish in surveyed tows 1996-2005

Year:	1996	1999	2001	2003	2005
Survey Data					
Minimum weight	0.35	1.30	1.01	0.52	0.21
Maximum weight	8.80	93.80	13.90	11.04	1153.98
Number of hauls	9	5	4	6	13

In contrast, Table 9 shows similar survey information for dusky rockfish. Maximum weights are much higher, and number of tows in which dusky rockfish are identified is much higher (Table 9). Data for black rockfish were also compiled for comparison with the depth strata for dusky and dark rockfish. Black rockfish are found in shallow waters and infrequently encountered in the bottom trawl survey due to their habitat preference (Table 10). Minimum weight, maximum weight, encounter rate in the survey are all more similar to dark rockfish than to dusky.

Table 9 Dusky rockfish in surveyed tows 1996-2005

Year:	1996	1999	2001	2003	2005
Survey Data					
Minimum weight	0.15	0.14	0.09	0.09	0.32
Maximum weight	2403.55	874.00	926.31	2605.66	2239.44
Number of hauls	109	89	70	115	140

Table 10 Black rockfish in surveyed tows 1996-2005

Year:	1996	1999	2001	2003	2005
Survey Data					
Minimum weight	0.50	1.27	0.66	1.73	0.99
Maximum weight	107.00	4.80	1.41	32.48	363.15
Number of hauls	3	8	3	4	9

The majority of GOA survey effort occurs in depths from 51-250 m (Figure 13). Catches of black and dark rockfish are similar in depth and the majority of catches occur between 51-150 m (Figure 14). The depth distribution of dusky rockfish is much deeper and catches often occur out to 300m (Figure 14). These data indicate that dark and black rockfish inhabit shallower depths than dusky rockfish.

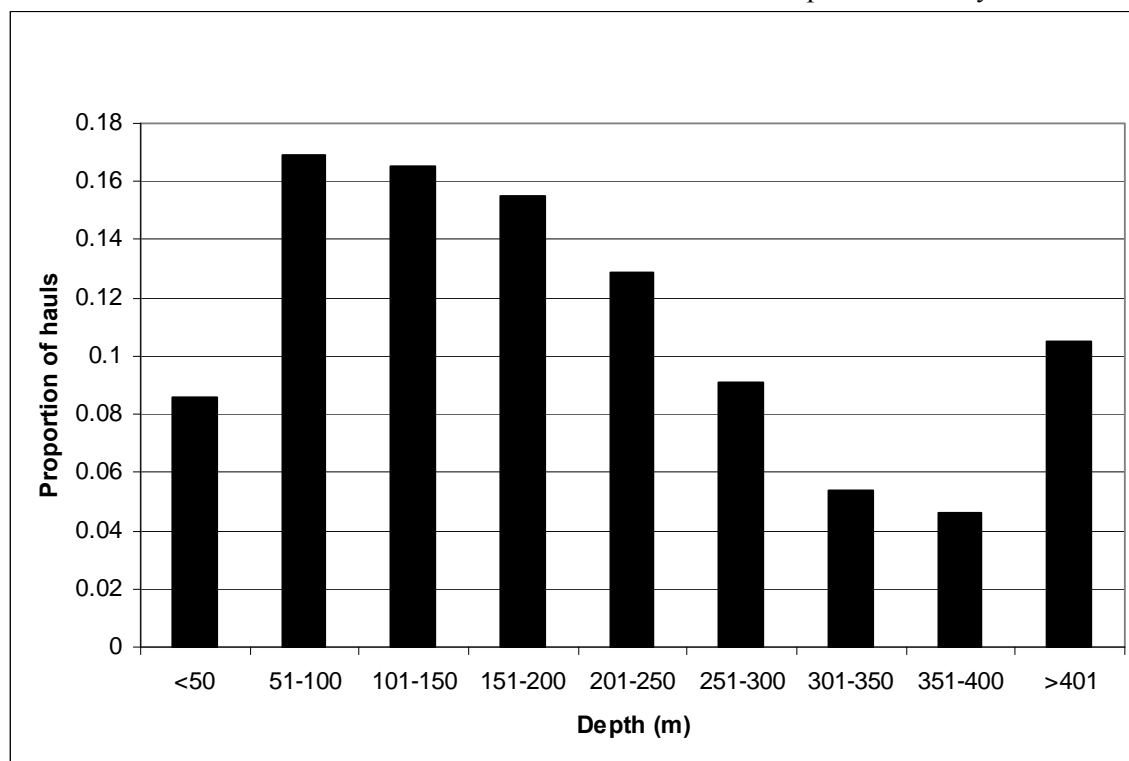


Figure 13 Proportion of survey hauls by depth for GOA surveys 1996-2005.

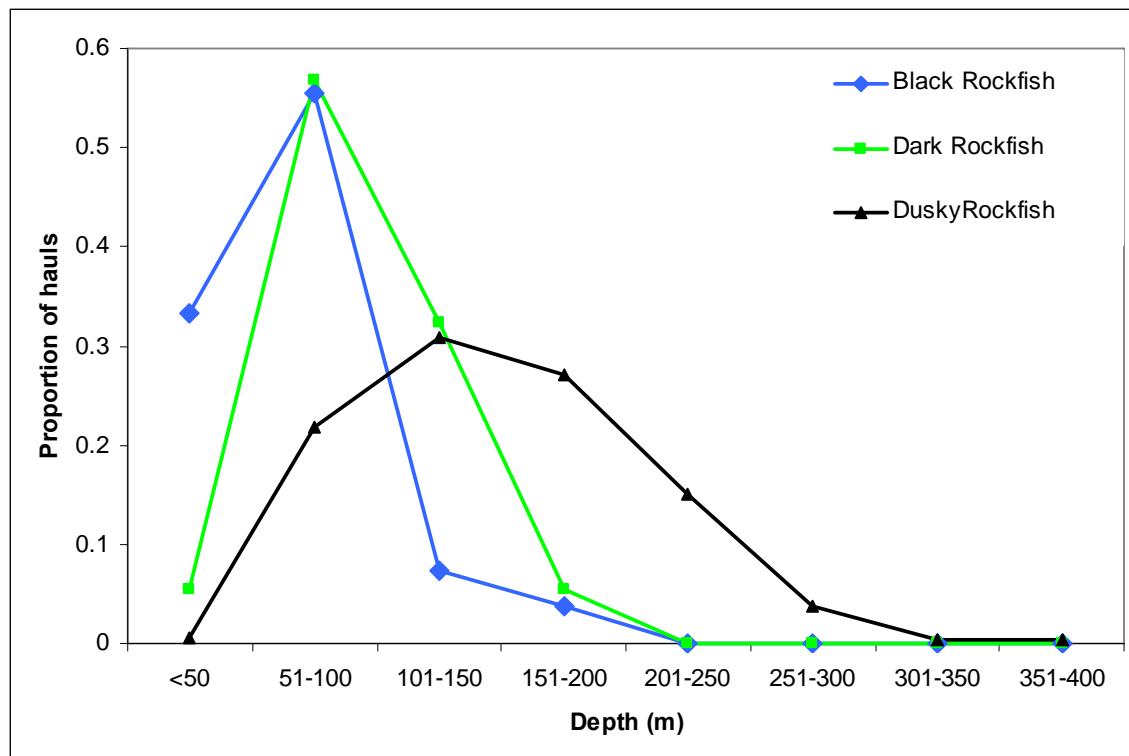


Figure 14 Proportion of hauls by depth and species 1996-2005.

3.1.2.2 BSAI “Other Rockfish” complex

Biomass of species in the “other rockfish” complex is generally dominated by shortspine thornyhead rockfish and dusky rockfish. Dark rockfish are encountered infrequently in the Aleutian Island survey. Biomass total within each year as well as summary information across years for all “other rockfish” species are presented in Table 11 through Table 16. When encountered in the BSAI region, dark rockfish were nearly always in the AI survey. In the Bering Sea dark rockfish were rarely encountered (Table 11). Figure 12 shows locations by haul of dark rockfish in the Aleutian Islands region, while Table 17 shows the breakdown of biomass in the survey for dark rockfish by Aleutian Island region and depth strata. The majority of dark rockfish when encountered were found in the Western Aleutian region in the depth strata from 0-100m (Table 13, Figure 12). Coefficients of variation on these biomass estimates are very high given the patchy nature of surveying these species (Table 17).

The catch of dark rockfish is also a minor component of the total other rockfish complex catch in the BSAI. Over the period 1997 through 2006 dark rockfish averaged 1.65 percent of the total other rockfish catch (Table 12) in the Aleutian Islands and 0.67 percent of the total other rockfish catch (Table 14).

Table 11 Biomass from the Aleutian Islands surveys.

Aleutian Islands	Year									
	1980	1983	1986	1991	1994	1997	2000	2002	2004	2006
dark rockfish						524	99	315	320	982
harlequin rockfish	0	6	18	22	20	68	25	24	4,663	48
dusky rockfish						712	1,306	612	2,089	6,687
redbanded rockfish	0	5	0	1	0	2	0	1	5	5
sharpchin rockfish	1	0	0	3	2	0	0	0	3	0
shortspine thornyhead	695	3,627	6,860	6,341	7,311	10,441	11,700	15,255	18,280	18,844
dusky rockfish	35	1,135	2,925	525	291					
Grand Total	730	4,774	9,803	6,891	7,624	11,747	13,130	16,208	25,359	26,567

Table 12 Dark rockfish catch in the Other rockfish complex in the Aleutian Islands

Year	Dark rockfish (kg)	Total Other rockfish (kg)	Percent Dark rockfish
1997	1,437.20	160,823.64	0.89
1998	2,481.67	239,856.45	1.03
1999	17,722.24	493,063.77	3.59
2000	7,077.73	446,640.26	1.58
2001	9,137.06	400,413.22	2.28
2002	2,265.41	364,762.49	0.62
2003	3,184.69	278,075.11	1.15
2004	4,358.53	262,720.79	1.66
2005	2,561.76	209,124.42	1.22
2006	1,755.50	300,384.95	0.58
1997 – 2006 Total	51,981.79	3,155,865.10	1.65

Data is from the Observer Program
 Dark rockfish includes dark rockfish and 'unidentified dark rockfish'
 Other rockfish includes all rockfish except Pacific ocean perch, rougheye, shortraker, and northern rockfish

Table 13 Biomass from the SE EBS surveys.

SE EBS	Year									
	1980	1983	1986	1991	1994	1997	2000	2002	2004	2006
dark rockfish						0	0	5	8	2
harlequin rockfish	0	0	18	0	2	0	0	2	4,167	7
dusky rockfish						138	55	97	1,359	731
redbanded rockfish	0	0	0	1	0	0	0	0	0	0
sharpchin rockfish	0	0	0	3	1	0	0	0	3	0
shortspine thornyhead	23	566	423	187	1,071	1,545	1,051	1,012	945	968
dusky rockfish	13	236	2,812	58	99					
Grand Total	36	802	3,253	248	1,172	1,683	1,107	1,117	6,481	1,708

Table 14 Dark rockfish catch in the Other rockfish complex in the Eastern Bering Sea

Year	Dark rockfish (kg)	Total Other rockfish (kg)	Percent Dark rockfish
1997	1,106.55	80,376.48	1.38
1998	1,974.78	109,446.12	1.80
1999	590.93	74,390.39	0.79
2000	3,762.21	120,410.89	3.12
2001	58.50	143,801.05	0.04
2002	149.31	160,016.14	0.93
2003	442.91	173,155.7	0.26
2004	110.69	187,706.58	0.06
2005	142.58	104,666.62	0.14
2006	94.87	101,365.04	0.09
1997 – 2006 Total	8,433.33	1,255,335.01	0.67

Data is from the Observer Program
 Dark rockfish includes dark rockfish and 'unidentified dark rockfish'
 Other rockfish includes all rockfish except Pacific ocean perch, rougheye, shortraker, and northern rockfish

Table 15 Biomass totals (by year) AI.

Aleutian Islands				
	1997-2006		1980-2006	
dark rockfish	2,240	2%		
harlequin rockfish	4,828	5%	4,894	4%
dusky rockfish	11,406	12%		
redbanded rockfish	13	0%	19	0%
sharpchin rockfish	3	0%	8	0%
shortspine thornyhead	74,521	80%	99,354	81%
dusky rockfish	NA	NA	18,557	15%
Grand Total	93,011		122,831	

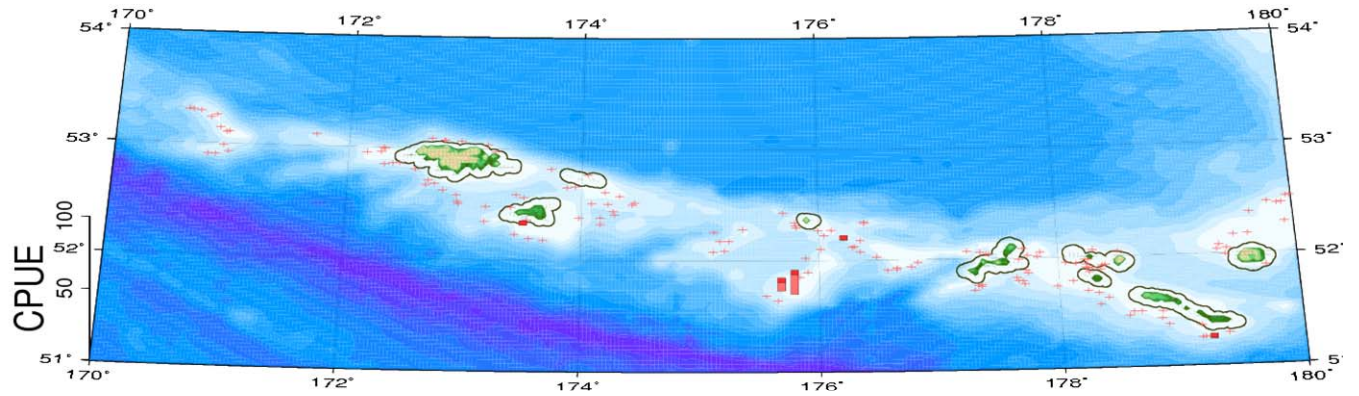
Table 16 Biomass totals (by year) SE EBS.

EBS (SE portion)				
	1997-2006		1980-2006	
dark rockfish	16	0%		
harlequin rockfish	4,176	35%	4,196	24%
dusky rockfish	2,380	20%		
redbanded rockfish	0	0%	1	0%
sharpchin rockfish	3	0%	6	0%
shortspine thornyhead	5,522	46%	7,791	44%
dusky rockfish	NA	NA	5,613	32%
Grand Total	12,096		17,608	

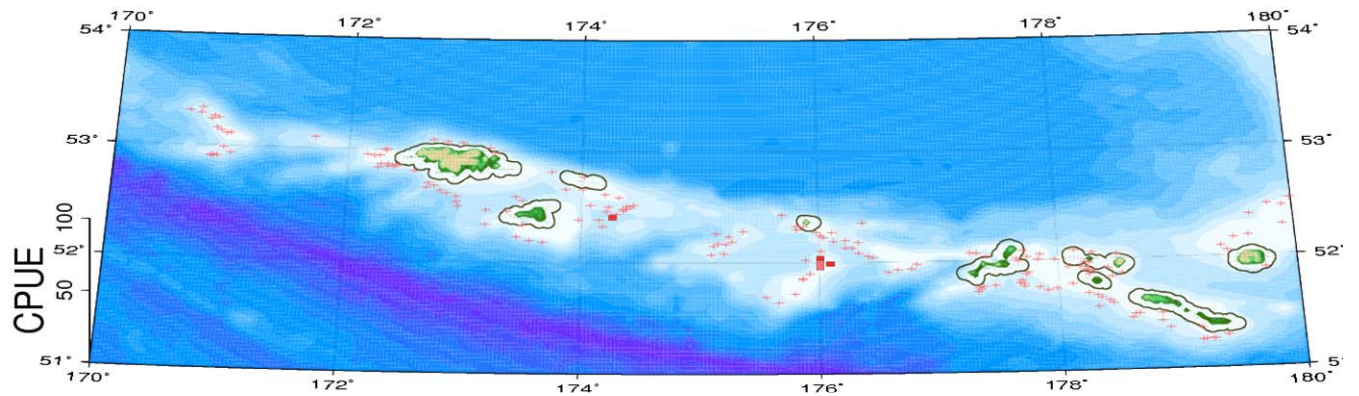
Table 17 Dark rockfish biomass from survey data by depth strata and region

	1997	2000	2002	2004	2006
Southern Bering Sea, 1 - 100m	0	0	5.4	8	1.3
Southern Bering Sea, 101 - 200m	0	0	0	0	0.8
Eastern Aleutian, 1 - 100m	32.4	0	0	0	0
Eastern Aleutian, 101 - 200m	0	0	0	0	8.4
Central Aleutian, 1 - 100m	0	0	0	0	72.9
Central Aleutian, 101 - 200m	9.9	0	0	2.3	0
Western Aleutian, 1 - 100m	481.6	98.6	310	308	898.4
Western Aleutian, 101 - 200m	0	0	0	1.9	0
Total	523.9	98.6	315.4	320.2	981.8
CV for total	61%	96%	57%	58%	47%

Dark rockfish 1997



Dark rockfish 2000



Dark rockfish 2002

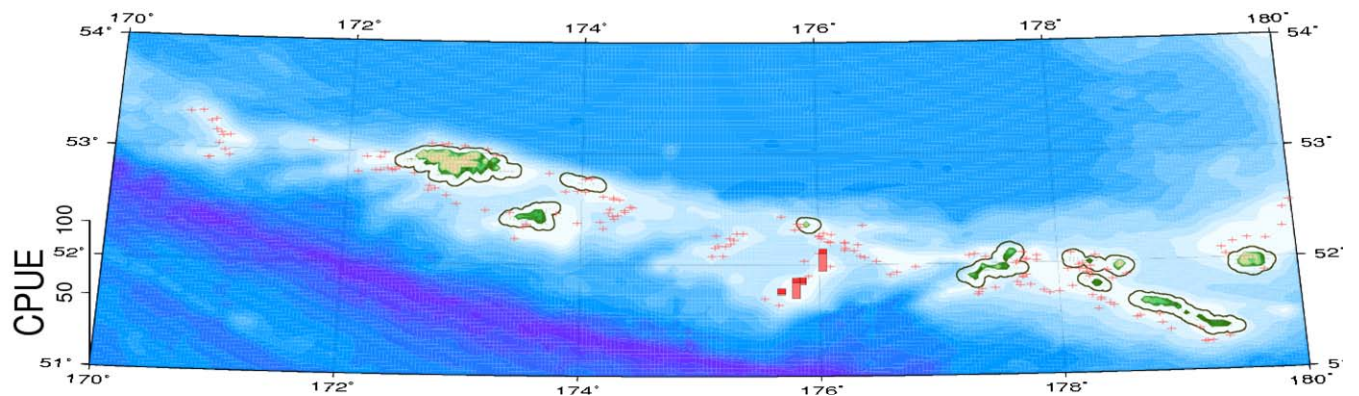
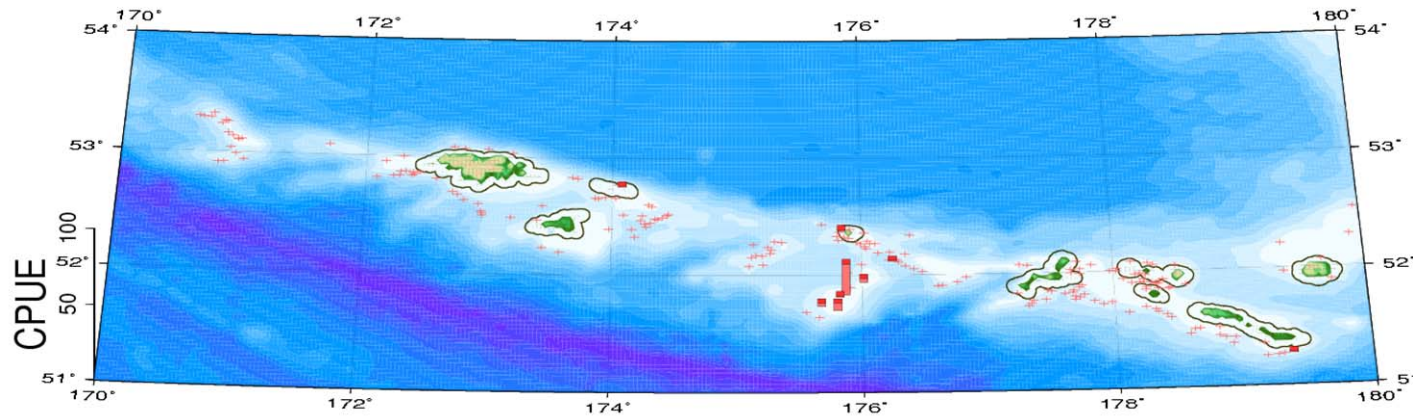


Figure 15 Dark rockfish CPUE from the AI survey 1997-2006

Dark rockfish 2004



Dark rockfish 2006

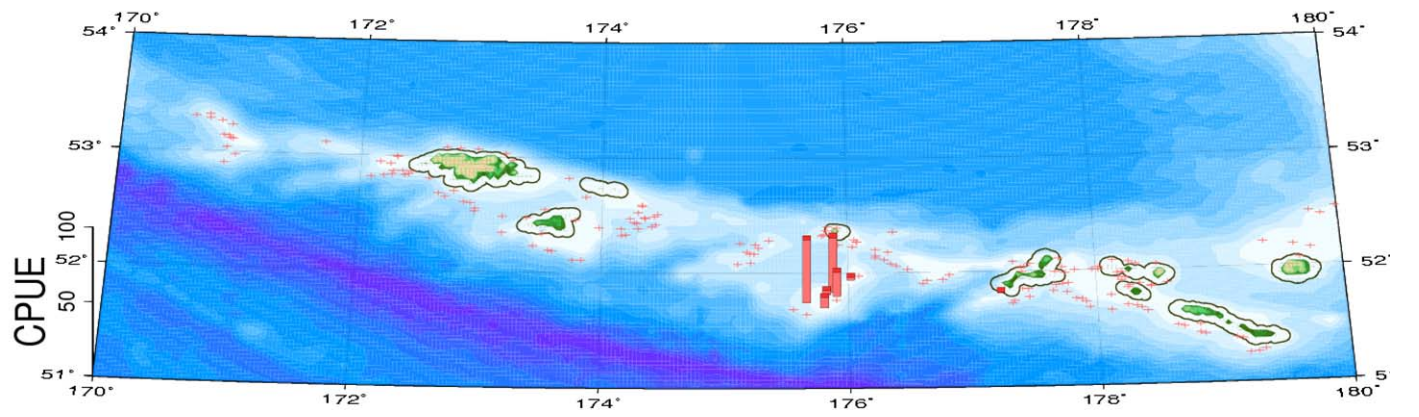


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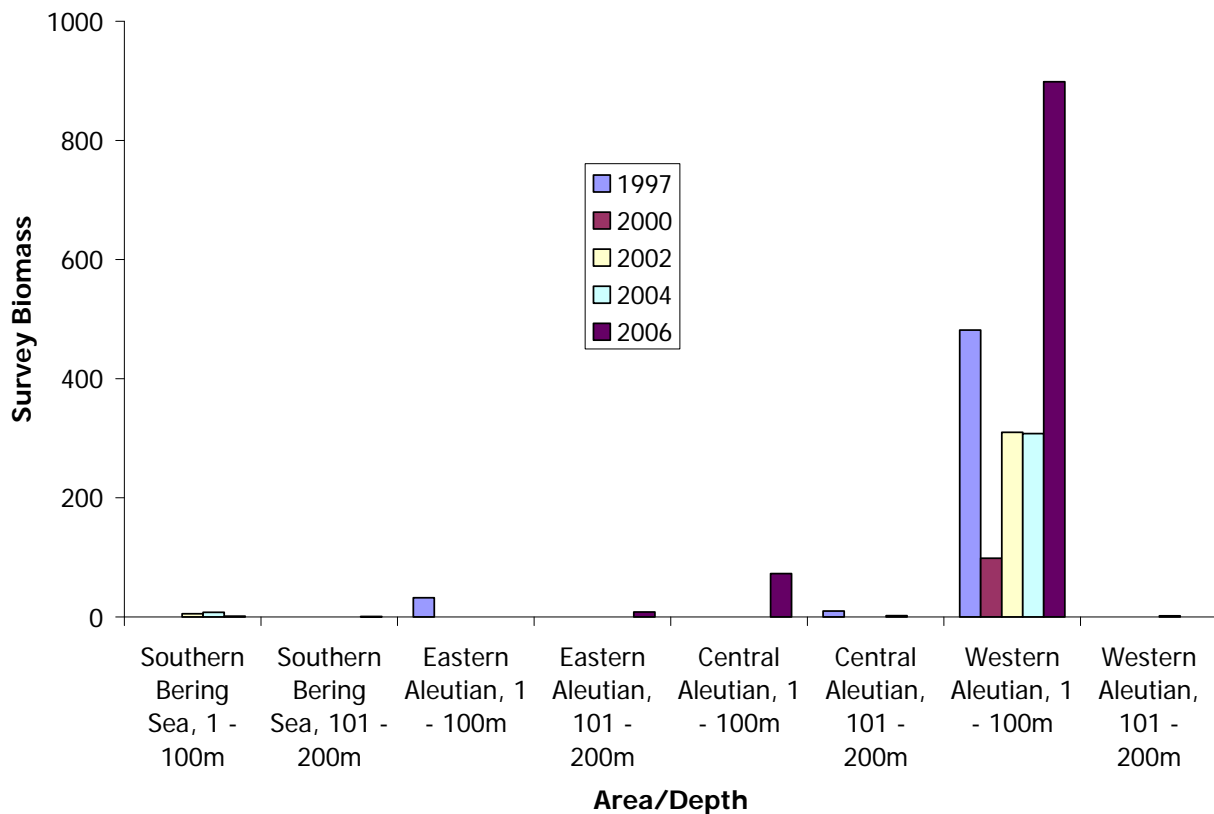


Figure 16 Biomass of dark rockfish in survey data by depth strata and region

Dark rockfish make up a small percentage of the overall survey biomass in the Aleutian Islands in any year, ranging from 0.8 to 4.5 % since 1997 (Table 18).

Table 18 Relative contribution of dark rockfish survey biomass to the total survey biomass in the AI 1997-2006

Year	Survey biomass of darks	Total survey biomass of "other rockfish" complex	Percent contribution of dark rockfish to survey total
1997	524	11753	4.5
2000	99	13130	0.8
2002	315	16207	2.0
2004	320	25360	1.3
2006	982	26566	3.7

Table 19 shows the relative weight (minimum and maximum) of dark rockfish in surveyed tows in the AI as well as the average bottom depth of the tow. Similar data for dusky rockfish in the AI surveys are presented in Table 20. The maximum weight of dark rockfish is lower than for dusky rockfish in two of the four years. Average bottom depth of haul is relatively shallow and number of hauls is relatively low in which dark rockfish were identified (Table 19).

Table 19 Dark rockfish data from surveyed tows in the AI

Year	1997	2000	2002	2004
Survey Data:				
Minimum weight	0.18	0.15	1.32	0.79
Maximum weight	33.00	16.35	27.86	49.95
Average weight	6.66	5.67	11.63	7.81
Average bottom depth	111.71	139.00	80.60	90.40
Number of hauls	7	3	5	10

Table 20 Dusky rockfish data from surveyed tows in the AI

Year	1997	2000	2002	2004
Survey Data:				
Minimum weight	0.22	0.07	0.29	0.46
Maximum weight	15.45	121.50	27.50	161.58
Average weight	3.68	7.90	4.41	13.40
Average bottom depth	150.70	166.66	154.48	163.21
Number of hauls	20	41	29	33

Tentative biomass estimates are available from State surveys for black rockfish species but are not available for dark rockfish at this time in State waters. Hydroacoustic survey experience in State waters indicates that as dark rockfish tend toward the bottom they are likely found in the hydroacoustic dead zone and can't be easily detected via this method (Dan Urban, pers. comm.). These species may be difficult species to survey other than with submersibles or ROV transects (Dan Urban, pers. comm.).

Figure 17 shows the occurrence of dark and dusky rockfish in surveys in the BS, AI and GOA in conjunction with other State managed species in these areas. Dark rockfish are caught in approximately 1% of all survey tows in these areas, which is considerably less than many State-managed species (Figure 17).

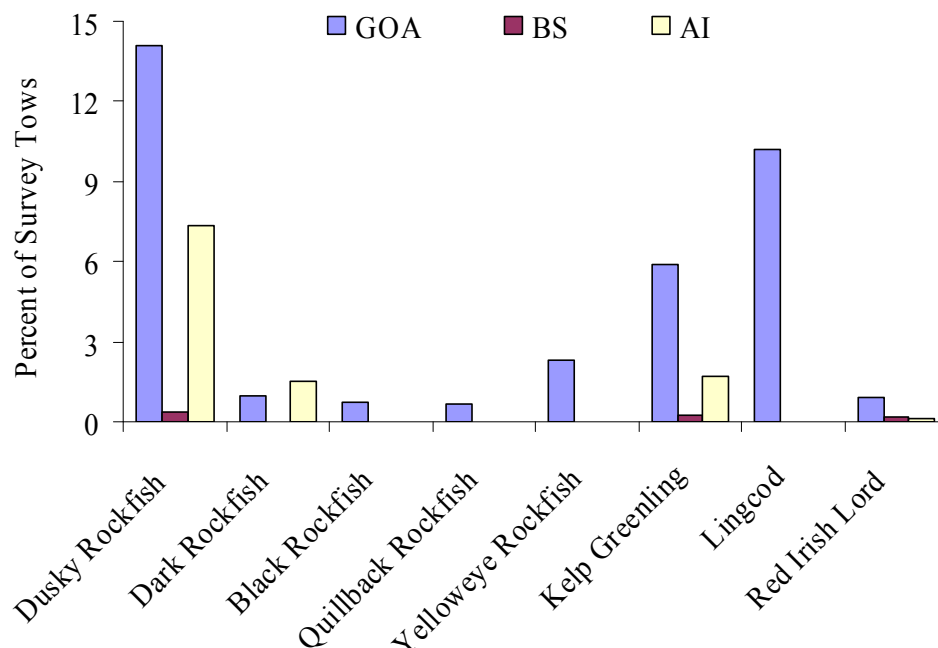


Figure 17 Percent of tows that caught dark and dusky rockfish in surveys by region (GOA = Gulf of Alaska, BS = Bering Sea, AI = Aleutian Islands) in conjunction with other nearshore species.

3.1.3 Stock Assessment

3.1.3.1 GOA pelagic shelf rockfish assessment

A single ABC is estimated for the pelagic shelf complex as a whole. An age-structured model is used to estimate the ABC and OFL for the dusky rockfish stock. This stock is currently in Tier 3. Under Amendment 56, Tier 3, the maximum permissible fishing mortality for ABC is $F_{40\%}$ and fishing mortality for OFL is $F_{35\%}$. These fishing rates are applied to the model estimated biomass to generate the ABC and OFL for the stock. The ABC is then apportioned over the three GOA management areas.

For widow, yellowtail and dark rockfish, the average of exploitable biomass from the three most recent trawl surveys is used to determine the ABC (Tier 5). In Tier 5, F_{ABC} is defined to be $\leq 0.75 \times M$. For M of 0.07 for the three species, F_{ABC} is then $0.75 \times M$, which equals 0.0525. Multiplying this value of F by the current exploitable biomass for dark, widow, and yellowtail rockfish (10,493 mt) yields an ABC of 551 mt for 2007. The ABC is then apportioned over the GOA management areas. **Error! Reference source not found.** Table 21 provides the 2007 OFL and ABC calculated by species based on the 2006 stock assessment. There was no 2006 GOA trawl survey thus estimates for Tier 5 species (e.g. all but dusky rockfish) are based upon the 2005 stock assessment results. Changes to the ABC and OFL for the PSR complex in 2007 from the previous year's assessment are due to updated catch information included in the projection model for dusky rockfish.

Table 21 2007 OFL and ABC, calculated by species

Species	OFL GW	ABC apportionment
Dusky	5,723	4,991
Dark	735 (combines all three species)	436
Widow		9
Yellowtail		106
Total PSR	6,458	5,542

The 2007 complex OFL is 6,458mt and the ABC is 5,542mt. This OFL is applied gulfwide. The ABC however is apportioned over the three GOA areas using the following apportionment for 2007 WGOA=1,466mt, CGOA = 3,325mt, WYAK =307mt and EYAK/SEO = 444 mt.

3.1.3.2 BSAI “Other Rockfish” Assessment

A single OFL is estimated for the “other rockfish” complex. ABCs are specified by individual area for the EBS and the AI. The entire complex is assessed at the Tier 5 level. In previous assessments Reuter and Spencer (2003; 2004) have recommended that shortspine thornyhead be split out of the “other rockfish” complex given that this species biomass makes up over 90% of the “other rockfish” biomass. The authors have also noted that the species is demographically different from other species in the complex with biomass estimates that have lower uncertainty than those of the remaining members of the complex (Reuter and Spencer, 2006). The Plan Team and SSC have continued to recommend that shortspine thornyhead remain in the complex. The Plan Team and SSC agree with the authors approach however in calculating OFL and ABC using different natural mortality rates for shortspine thornyhead ($M=0.03$) and for the remaining “other rockfish” biomass ($M=0.09$).

The BSAI OFL represents the sum of the individually calculated shortspine thornyhead (SST) OFL with the OFL from the remaining species in the complex (calculated as a group). The ABC is calculated separately by area (for EBS and AI). Each area-specific ABC represents the sum of the individually calculated ABC for shortspine thornyhead together with the group ABC for the remaining species in the complex. The respective BSAI biomass estimates are calculated by adding the average biomass (1997-2006 surveys) of the AI (SST = 14,905 mt; "other rockfish" = 3,698 mt) with the average EBS slope survey (2002-2004) (SST = 17,906 mt, "other rockfish" 19 mt) estimate and the EBS shelf survey ("other rockfish" 142 mt). BSAI OFL equals ((SST BSAI biomass (32,811) x 0.03 = 984) + ("other rockfish" BSAI biomass (3,859 mt) x 0.09 = 347)) = 1,331. For calculation of the respective ABCs each of the biomass estimates were multiplied by 0.75 of M (SST 0.75 x 0.03 = 0.0225 and "other rockfish" 0.75 x 0.09 = 0.0675). The resulting OFLs and ABCs for 2007 are shown below:

Table 22 "other rockfish" complex Tier 5 for 2007 (from Reuter and Spencer 2006):

Region	M	Exploitable biomass (mt)	F _{ABC}	ABC (mt)	F _{OFL}	OFL (mt)
BSAI_{SST}	0.03	32,811			0.03	984
BSAI_{Orock}	0.09	3,859			0.09	347
BSAI_{Total}						1,331
EBS_{SST}	0.03	17,906	0.0225	403		
EBS_{Orock}	0.09	161	0.0675	11		
EBS_{Total}				414		
AI_{SST}	0.03	14,905	0.0225	335		
AI_{Orock}	0.09	3,698	0.0675	250		
AI_{Total}				585		

3.2 Pelagic Shelf Rockfish Fishery (GOA)

Pelagic shelf rockfish (GOA) have been caught almost exclusively with bottom trawls although some contribution from observed longline vessels has occurred. OFLs are specified gulfwide while ABCs and TACs are apportioned by area in the GOA. Overfishing levels in recent years are lower than in the period from 1998-2003 while ABCs have remained fairly constant (Table 23). Generally, in the PSR fishery in the GOA, the TAC has been established as equal to the ABC (Table 23).

Table 23 Overfishing levels (OFL), acceptable biological catch (ABC) and total allowable catch (TAC) levels for the GOA pelagic shelf rockfish complex 1998-2006

Year	OFL	ABC (total all areas)	TAC (total all areas)
1998*	9,420	4,880	4,880
1999	9,420	4,880	4,880
2000	9,040	5,980	5,980
2001	8,220	5,980	5,490
2002	8,220	5,490	5,490
2003	8,220	5,490	5,490
2004	5,570	4,470	4,470
2005	5,680	4,553	4,553
2006	6,662	5,436	5,436

*includes black and blue rockfish which were removed from the GOA FMP in 1998

The majority of the catch occurs in the Central GOA management area (Table 24).

Table 24 Commercial catch^a (mt) of fish in the pelagic shelf rockfish complex in the Gulf of Alaska, with Gulfwide values of acceptable biological catch (ABC) and total allowable catch (TAC), 1988-2005. Updated through October 18, 2005. (Lunsford et al. 2005)

Year	Category	Regulatory Area ^b					Gulfwide		
		Western	Central	Eastern	West Yakutat ^c	Southeast Outside ^d	Total	ABC	TAC
1988	Foreign	0	0	0	-	-	0		
	U.S.	400	517	168	-	-	1,085		
	JV	Tr	1	0	-	-	1		
	Total	400	518	168	-	-	1,086	3,300	3,300
1989	U.S.	113	888	737	-	-	1,738	6,600	3,300
1990	U.S.	165	955	527	-	-	1,647	8,200	8,200
1991	U.S.	215	1,191	936	-	-	2,342	4,800	4,800
1992	U.S.	105	2,622	887	-	-	3,605	6,886	6,886
1993	U.S.	238	2,061	894	-	-	3,193	6,740	6,740
1994	U.S.	290	1,702	997	-	-	2,989	6,890	6,890
1995	U.S.	108	2,247	536	471	64	2,891	5,190	5,190
1996	U.S.	182	1,849	265	190	75	2,296	5,190	5,190
1997	U.S.	96	1,959	574	536	38	2,629	5,140	5,140
1998	U.S.	60	2,477	576	553	22	3,113	4,880	4,880
1999	U.S.	130	3,835	694	672	22	4,659	4,880	4,880
2000	U.S.	190	3,074	467	445	22	3,731	5,980	5,980
2001	U.S.	121	2,436	451	439	12	3,008	5,980	5,980
2002	U.S.	185	2,680	457	448	9	3,322	5,490	5,490
2003	U.S.	164	2,194	617	607	10	2,975	5,490	5,490
2004	U.S.	281	2,182	211	199	12	2,885	4,470	4,470
2005	U.S.	118	1,843	218	215	3	2,397	4,553	4,553

^aCatches for 1988-97 include black rockfish and blue rockfish, which were members of the complex during those years.

^bCatches for West Yakutat and Southeast Outside areas are not available for years before 1996. Eastern area is comprised of the West Yakutat and Southeast Outside areas combined.

^cWest Yakutat area is comprised of statistical areas 640 and 649.

^dSoutheast Outside area is comprised of statistical areas 650 and 659.

Catches of PSR have generally been below TACs. Annual catches have increased from 1988 to 1992 and have fluctuated since that time. The pattern can largely be explained by management actions affecting rockfish during this time period. Prior to 1991 TACs for more desirable rockfish species such as Pacific ocean perch were relatively large, thus the incentive to target lower valued rockfish (such as dusky rockfish in the PSR complex) was low. As TACs for Pacific ocean perch became more restrictive in the 1990's the incentive to target other rockfish species increased, resulting in higher catches for PSR species and a high in 1992 of 3,605 mt gulfwide. In-season management measures have largely prevented further increases in the dusky rockfish fishery. In some years (e.g., 1997-1998 and 2000-2005) the PSR fishery in the Central GOA was closed prior to reaching the PSR TAC. The fishery was closed either to ensure that catch did not exceed TAC, to prevent excessive bycatch of species such as Pacific ocean perch, or to prevent exceeding seasonal PSC limits established for Pacific halibut (Lunsford et al. 2005).

Under the current management the Gulf of Alaska rockfish fisheries open on January 1st for non-trawl gear participants. The opening for trawl gear is near July 1st. The trawl opening is timed to coincide with

the availability of the third seasonal halibut PSC allocation. The fishery is also timed to accommodate the sablefish longline survey that occurs later in the summer. The fishery is also timed to accommodate the sablefish longline survey that occurs later in the summer. The rockfish fisheries, which also take some sablefish, must be completed early enough to allow the redistribution of sablefish stocks to avoid possible survey bias. The opening coincides with the openings of the Aleutian Islands Pacific ocean perch and Bering Sea flathead sole fisheries to distribute effort among the fisheries.

Both the trawl and non-trawl fisheries are prosecuted from a single TAC, with the harvest from the trawl fishery limited to the remaining available TAC after the non-trawl fleet has prosecuted the fishery from its January 1st opening. Since the non-trawl fleet has shown little interest in the fisheries historically, most of the TAC has been harvested by the trawl fleet.

Most participants target Pacific ocean perch first, until the TAC of that species is fully harvested. Pacific ocean perch are a larger biomass and typically are easier to target than either northern rockfish or PSR. The season for Pacific ocean perch usually lasts between one and two weeks. Once the Pacific ocean perch fishery is closed, vessels will usually move on to the northern rockfish or PSR directed fisheries. The directed fisheries for northern rockfish and PSR typically last less than one month, closing before the end of July. Managers have exercised some caution in managing the fishery, occasionally closing the northern rockfish and PSR fisheries to ensure that the OFL for Pacific ocean perch is not reached. When sufficient TAC and PSC limits have remained available, managers have reopened the fisheries later to allow participants to complete the harvest.

Harvests of the rockfish TACs or PSC limit have, on occasion, resulted in closures of the rockfish fisheries. In 2000, halibut PSC closed the PSR fishery. In 2001, halibut PSC closed both the northern rockfish and PSR fisheries in July. The fisheries were reopened on October 1st, when the fifth seasonal halibut PSC allowance became available. The fisheries closed again near the end of October, after harvest of the deep-water halibut PSC allocation.

From 1991-2005, dark rockfish have not made up more than 2.6 percent of the complex catch for PSR (Table 25). In most of these years dark rockfish made up only trace amounts of the catch with more than 99% of the catch made up of dusky rockfish. In 1999, dark rockfish made up 2.6% with dusky rockfish making up 97.4% of the catch. In 2004, widow rockfish made up a larger relative percentage of the total catch than in previous years with dusky rockfish making up 95.5% and dark rockfish 0.4%. In both of these years the high observed catch for dark rockfish (2.6% in 1999) and widow rockfish (4.5% in 2004) respectively were due to abnormally large individual tows recorded by observers (C. Lunsford, pers. comm.). In most years large tows of dark rockfish are not recorded by observers, indicating large catches of dark rockfish are uncommon in the trawl fishery. In 2005, the catch composition was 98.8% dusky rockfish and 1.1% dark rockfish (Table 25). Incidental catch of PSR species in State fisheries is accounted for under the Federal TAC. The catch information is summarized from fish tickets however, which did not differentiate between dusky rockfish and dark rockfish until 2005. Logbooks for the State black rockfish fishery in Kodiak differentiate between the two species and show a high proportion of incidentally caught dark rockfish (see section 3.4.1 for more information), however, prior to 2005, the associated fish tickets show only aggregate dusky rockfish. Thus prior to 2005 there is likely underreporting of dark rockfish breakout in the federal PSR catch as a result of landed dark rockfish in State waters that are being reported as dusky rockfish on fish tickets and in Federal production reports.

Table 25 Percentage of complex catch (from observer data)

Year	Dusky	Dark	Yellowtail	Widow
1991	93.5	0.2	5.1	1.2
1992	98.9	0.3	trace	0.8
1993	98.1	trace	0.5	1.4
1994	98.3	1.2	0.1	0.4
1995	99.2	trace	trace	0.8
1996	99.7	trace	trace	0.3
1997	99.9	trace	trace	0.1
1998	99.9	trace	trace	trace
1999	97.4	2.6	trace	trace
2000	99.2	0.6	0.1	0.2
2001	99.7	0.3	trace	trace
2002	99.4	0.5	trace	0.1
2003	98.8	0.8	trace	0.3
2004	95.1	0.4	trace	4.5
2005	98.8	1.1	0.2	trace

Source: C. Lunsford, NMFS

Catches for dusky rockfish are concentrated on several relatively shallow, offshore banks on the outer continental shelf particularly the “W” grounds west of Yakutat, Portlock Bank (northeast of Kodiak Island) and around Albatross Bank south of Kodiak Island (Lunsford et al. 2005). Highest CPUE in the commercial fishery is generally at depths of 100-149 m (Reuter 1999).

From 1988-1995 nearly all of the catch of dusky rockfish was taken by large factory trawlers that processed the fish at sea. Since 1999 a larger proportion of the catch has been taken by smaller shore-based trawlers in the Central GOA and the catch has been delivered to Kodiak-based processing plants. These shore-based trawlers have accounted for the following percentages of trawl catch in the CGOA from 1996-2004 (Table 26).

Table 26 Percent shore-based trawl catch in Central GOA area 1996-2004 (Lunsford et al 2005)

Year	Percent shore-based trawl catch in Central GOA area
1996	27.1
1997	18.1
1998	25.0
1999	45.2
2000	74.4
2001	58.0
2002	49.7
2003	n/a
2004	64.6

The North Pacific Groundfish Observer Program collects catch and bycatch data used for management and in-season monitoring of groundfish fisheries. Since 1990, all vessels larger than 60 ft (length overall) participating in the groundfish fisheries have been required to have observers onboard at least part of the time. The amount of observer coverage is based on vessel length, with 30% coverage required on vessels 60 ft to 125 ft, 100% coverage on vessels larger than 125 ft, and 100% coverage at shore-based processing facilities. There are no observer coverage requirements for vessels less than 60 ft.

For Gulf of Alaska fisheries, observer coverage is lower in some target fisheries due to the prevalence of smaller vessels in the GOA fishing fleet than in the Bering Sea fleet. Over the past ten years, there has generally been an increasing level of participation by smaller vessels in the GOA groundfish fisheries, particularly trawl and fixed gear catcher vessels less than 60 ft (NPFMC 2004). Target and incidental catch for all vessels is calculated using the reported catch on fish tickets (for catcher vessels delivering shoreside), weekly production reports (WPR) or observer data (for catcher/processors and motherships). Rates are not extrapolated from observed vessels to unobserved (ie as with PSC rates in the GOA) thus unobserved vessel catch approximation is dependant upon fish ticket data. For catcher vessels a discard rate is applied to estimate discards at sea.

Table 27 Retained catch (mt) of PSR species by gear type 1998-2005 (screened for confidentiality).
Source: NMFS Catch Accounting

Species and year	Trawl	Fixed gear*	Jig Gear
1998			
Dusky rockfish	1,288	84	4
PSR**	1,510	0	0
Widow rockfish	18	0	0
Yellowtail rockfish	0	0	2
1999			
Dusky rockfish	2,364	19	3
PSR**	2,136	0	0
Widow rockfish	0	0	0
Yellowtail rockfish	0	1	3
2000			
Dusky rockfish	2,395	15	5
PSR**	1,092	0	0
Widow rockfish	0	0	0
Yellowtail rockfish	0	1	2
2001			
Dusky rockfish	1,932	9	9
PSR**	892	0	0
Widow rockfish	0	0	0
Yellowtail rockfish	24	0	1
2002			
Dusky rockfish	1,807	3	15
PSR**	1,195	0	0
Widow rockfish	0	0	0
Yellowtail rockfish	0	0	1
2003			
Dusky rockfish	2,946	9	8
Widow rockfish***	n/a	n/a	n/a
Yellowtail rockfish	0	0	3
2004			
Dusky rockfish	2,410	8	53
Widow rockfish	n/a	n/a	n/a
Yellowtail rockfish	0	1	1
2005			
Dusky rockfish	2,023	18	17
Widow rockfish	n/a	n/a	n/a
Yellowtail rockfish	0	n/a	1

*fixed gear includes hook and line and pot gear. Jig gear is not included as it is broken out separately.

PSR aggregate were not identified to species *total only available in 2003 (7mt)

Dark rockfish are also caught in the state jig fishery by vessels targeting black and dusky rockfish. Dark rockfish have often been misidentified as black rockfish and caught in the black rockfish commercial fishery (Orr and Blackburn 2004). Dark rockfish have not been separately identified in the black rockfish fishery on fish tickets, although recent dockside sampling efforts by ADF&G and logbooks have identified dark rockfish separately from dusky rockfish species during the state jig fishery (see section 3.4.1 for additional information).

Most incidental catch for hauls targeting pelagic shelf rockfish consists primarily of northern rockfish, other rockfish, and Pacific ocean perch (Ackley and Heifetz 2001). The other rockfish complex includes 15 rockfish species with the primarily caught species in the category being sharpchin, redstripe, harlequin, silvergry, yellowmouth and redbanded rockfish. Dusky rockfish was the primary incidental catch in hauls targeting northern rockfish (Ackley and Heifetz 2001). The incidental catch of pelagic shelf rockfish species in the non-rockfish fisheries is presumed to be small (Lunsford et al 2005).

Discard rates of pelagic shelf rockfish have been lower than the rates for other slope rockfish species and in recent years (2000-2004) have ranged from 2.4% to 4.7% (Lunsford et al 2005). Dark rockfish are presently included in the MRA for aggregate rockfish in the GOA. MRAs for aggregate rockfish range from 5-15% by fishery, except for arrowtooth flounder which remains at 0%. In October 2007, the Council recommended that the MRA for aggregate rockfish in the GOA arrowtooth flounder fishery be increased to 5%. This regulatory revision is expected to be implemented in late-2008.

3.3 BSAI “Other Rockfish” fishery

Dark rockfish are managed as part of the “other rockfish” complex in the Aleutian Islands/Eastern Bering Sea. Dusky rockfish and shortspine thornyheads are the two most abundant species in this complex. The distributions of other species in this complex including dark rockfish are not well documented (Reuter and Spencer, 2006). There is no targeted fishery for “other rockfish” in the AI or EBS as the entire TAC is needed for incidental catch in other groundfish fisheries.

OFLs for the “other rockfish” complex are set for the entire BSAI area, while ABCs and TACs are set by area for the EBS and AI (Table 28). The TAC in the EBS has been set below ABC in recent years while the AI TAC is set equal to ABC. TACs are set to meet incidental catch needs.

Table 28 OFL, ABC and catch for the “other rockfish” complex in the BSAI 2004-2007

Year	Area	OFL	ABC	TAC	Catch
2004	BSAI	1,280			
	EBS		960	960	317
	AI		634	634	337
2005	BSAI	1,870			
	EBS		810	460	178
	AI		590	590	286
Year	Area	OFL	ABC	TAC	Catch
2006*	BSAI	1,870			
	EBS		810	460	153
	AI		590	590	417
2007	BSAI	1,330			
	EBS		414	n/a	n/a
	AI		585	n/a	n/a

*catch through 11/04/06

Historical catches of “other rockfish” are shown in Table 29. Peak catch in the EBS occurred in 1978 with a catch of 941 mt while peak catch in the AI was in 1982 with a harvest of 2,114 (Reuter and Spencer, 2006).

Table 29 Summary of catches (mt) of “other rockfish” in the eastern Bering Sea and Aleutian Islands regions. (from Reuter and Spencer, 2006) data from NMFS/AK regional website.

Year	<u>Eastern Bering Sea</u>						<u>Aleutian Islands</u>					
	<u>Domestic</u>						<u>Domestic</u>					
	<u>For.</u>	<u>JV</u>	<u>DAP</u>	<u>Total</u>	<u>ABC</u>	<u>OFL</u>	<u>For.</u>	<u>JV</u>	<u>DAP</u>	<u>Total</u>	<u>ABC</u>	<u>OFL</u>
1977*	112	--	--	112			700	--	--	700		
1978*	941	--	--	941			212	--	--	212		
1979*	759	--	--	759			1,039	--	--	1,039		
1980	456	3	--	459			420	--	--	420		
1981	331	--	25	356			328	--	--	328		
1982	262	11	3	276			2,114	--	--	2,114		
1983	212	8	--	220			1,041	4	--	1,045		
1984	121	8	47	176			42	14	--	56		
1985	33	3	56	92			2	14	83	99		
1986	4	12	86	102			Tr	15	154	169		
1987	3	4	467	474			0	6	141	147		
1988	0	8	333	341			0	68	210	278		
1989	0	4	188	192			0	0	481	481		
1990	0	0	418	418			0	0	858	858		
1991	0	0	422	422			0	0	343	343		
1992	0	0	600	600			0	0	664	664		
1993	0	0	192	192			0	0	496	496		
1994	0	0	133	133			0	0	292	292		
1995	0	0	288	288			0	0	219	219		
1996	0	0	170	170			0	0	282	282		
1997	0	0	163	163			0	0	305	305		
1998	0	0	188	188			0	0	364	364		
1999	0	0	135	135			0	0	631	631		
2000	0	0	232	232	369	492	0	0	563	563	685	913
2001	0	0	295	295	361	482	0	0	592	592	676	901
2002	0	0	398	398	361	482	0	0	518	518	676	901
2003†	0	0	293	293	960	1,280	0	0	366	366	634	846
2004†	0	0	289	289	960	1,280	0	0	314	314	634	846
2005†	0	0	157	157	809	1,865	0	0	275	275	590	1,865
2006§	0	0	139	139	809	1,865			389	389	590	1,865

These biomass estimates were revised (2001) to show the catch of those species currently in the “other rockfish” category. † Catch estimates updated 2006 § Estimated removals through October 16th, 2006.

In the Aleutians, “other rockfish” are primarily caught by the atka mackerel trawl fishery (dusky rockfish) and to a lesser extent the sablefish longline fishery (shortspine thornyheads). In the Bering Sea “other rockfish” are taken in small amounts by several fisheries, primarily the Pacific cod trawl and longline fisheries. From 1990-2001 dark rockfish comprised <1% of the “other rockfish” catch in the EBS and 3% in the AI catch. Table 30 Common and scientific names of rockfish in the "other rockfish" reporting category identified, 1990-2001, by AFSC research surveys (at least one observation) and U.S. fishery observers (greater than 1% of hauls) in the eastern Bering Sea and Aleutian Islands. Source: Reuter and Spencer, 2006

Table 30 Common and scientific names of rockfish in the "other rockfish" reporting category identified, 1990-2001, by AFSC research surveys (at least one observation) and U.S. fishery observers (greater than 1% of hauls) in the eastern Bering Sea and Aleutian Islands. Source: Reuter and Spencer, 2006

Common name	Scientific name	EBS		AI	
		Survey	Fishery	Survey	Fishery
Red banded rockfish	<i>Sebastes babcocki</i>	~	~	1%	<1%
Dark rockfish	<i>Sebastes ciliatus</i>	~	1%	4%	3%
Dusky rockfish	<i>Sebastes variabilis</i>	18%	39%	22%	45%
Redstripe rockfish	<i>Sebastes proriger</i>	~	1%	~	1%
Yelloweye rockfish	<i>Sebastes ruberrimus</i>	~	1%	<1%	1%
Harlequin rockfish	<i>Sebastes variegatus</i>	~	1%	9%	5%
Sharpchin rockfish	<i>Sebastes zacentrus</i>	~	<1%	<1%	<1%
Shortspine thornyhead	<i>Sebastolobus alascanus</i>	62%	43%	61%	34%

For catch accounting purposes dark rockfish are grouped with redbanded, redstripe, yelloweye, and sharpchin rockfish (“Rockfish unid” in Table 31). In 2006, the catch of these four species was 61 mt in the AI and 6 mt in the BS). Historically the majority of the catch in the fishery (both EBS and AI) has been of dusky rockfish and shortspine thornyhead which make up the majority of the biomass in the complex as well.

Recent catches in both the AI and EBS show a similar trend. There is no target fishery for the “other rockfish” complex. Target fisheries which catch these two species are primarily the Atka mackerel trawl fishery and Pacific cod longline fishery (for dusky rockfish catch) and the longline fisheries (sablefish, turbot, halibut) as well as rockfish trawl fishery (for shortspine thornyhead catch) (Reuter and Spencer, 2006). No specific information is currently available on the catch by fishery of the dark rockfish component of the catch in the AI or EBS. Dark rockfish are presently included in the MRA for aggregate rockfish in the BSAI. MRAs for aggregate rockfish range from 5-15% by fishery.

Table 31 Total fishery catch (mt) of top species in “other rockfish” group in the Aleutian Islands and eastern Bering Sea from 2003-2006. *Source: Reuter and Spencer, 2006. Data from Catch Accounting System, NMFS AK Regional Office.*

Aleutian Islands				
2006*	541	542	543	Total
Dusky	101	48	9	158
Shortspine	35	96	15	146
Rockfish unid.	7	54	>1	61
Harlequin	4	9	10	23
Total	147	207	34	388
2005	541	542	543	Total
Dusky	66	53	14	133
Shortspine	40	46	27	113
Rockfish unid.	1	4	9	14
Harlequin	1	8	5	14
Total	108	111	55	274
2004	541	542	543	Total
Dusky	33	81	18	132
Shortspine	42	36	18	96
Harlequin	1	17	18	36
Rockfish unid.	>1	26	21	47
Total	76	160	75	311
2003	541	542	543	Total
Dusky	62	73	17	152
Shortspine	67	69	41	177
Harlequin	1	22	11	34
Rockfish unid.	1	1	1	3
Total	130	165	70	366

*Total catch as of October 16, 2006

Eastern Bering Sea	
2006*	EBS
Shortspine thornyhead	92
Dusky	40
Rockfish unid.	6
Total	139
2005	EBS
Shortspine thornyhead	119
Dusky	36
Rockfish unid.	1.5
Total	157
2004	EBS
Shortspine thornyhead	242
Dusky	32
Rockfish unid.	15
Total	289
2003	EBS
Shortspine thornyhead	256
Dusky	23
Rockfish unid.	13
Total	293

*Total catch as of October 16, 2006

3.4 Other Groundfish Stocks

Groundfish stocks caught in conjunction with fisheries for pelagic shelf rockfish in the GOA include Pacific ocean perch, northern rockfish and species in the “other slope” rockfish complex. In the BSAI there are no targeted fisheries for “other rockfish”, but these fish are commonly caught in the Atka mackerel fishery (AI) and Pacific cod longline and trawl fisheries in the BSAI. Descriptions of these species and fisheries are contained in the annual Stock Assessment and Fishery Evaluation reports for the Gulf of Alaska (NPFMC 2005).

Dark rockfish are often caught in conjunction with black rockfish. Black rockfish is managed by the State of Alaska in both the GOA and BSAI. Commercial fisheries targeting black rockfish use jig gear. Management measures for black rockfish vary by region (Table 32). Black rockfish are difficult to assess given the habitat they inhabit (D. Urban, pers. comm.). A stock assessment does not exist for black rockfish in any of the management regions. Methodologies which utilize a combination of acoustic measures and age data are being developed for assessment purposes (N. Sagalkin, pers comm.). Management of black rockfish by region is summarized below. Where possible, information on the bycatch and landings of dark rockfish in the black rockfish fishery are included for each region.

Table 32 Summary of black rockfish regulations by registration area (from Mattes and Failor-Rounds, 2005)

	Kodiak	Chignik	South Alaska Peninsula	Aleutian Islands
Opening date	January 1	January 1	January 1	January 1
Registration	Nonexclusive	Superexclusive	Nonexclusive	Nonexclusive
Trip Limits	5000 lbs. or 2500 lbs. if registered for incidental harvest	no	no	no
Logbooks	mandatory	mandatory	mandatory	mandatory
CFEC Permit and gear types	M05B for hand troll or M26B for mechanical jig	M05B for hand troll or M26B for mechanical jig	M05B for hand troll or M26B for mechanical jig	M05B for hand troll or M26B for mechanical jig
Vessel Registration	mandatory	mandatory	mandatory	mandatory
number of jig machines	up to 5	up to 5	up to 5	up to 5
number of hooks	up to 30 per line or a single continuous line with 150 hooks no more than 250 hooks on the vessel	up to 30 per line or a single continuous line with 150 hooks	up to 30 per line or a single continuous line with 150 hooks	not specified in regulation

3.4.1 GOA black rockfish fishery

Dark rockfish and black rockfish often co-occur in nearshore kelp beds of the Gulf of Alaska, and are superficially similar in appearance, especially in body color, which can lead to misidentification. Black rockfish are a nearshore, shallow water species that are commercially targeted using jig gear. Black and blue rockfish were both removed from the Federal FMP in 1998 under Amendment 46 and turned over to the State of Alaska for management due to concerns of overfishing these species under the relatively high TAC for the pelagic shelf species complex (NPFMC 1998).

3.4.1.1 Black Rockfish Fishery Westward Region

In the GOA, the commercial fishery for black rockfish opens in all Westward districts on January 1st and remains open until December 31, or until GHLs are attained (Mattes and Failer-Rounds 2005). Harvests are monitored through fish ticket records, processor reports and dockside sampling of commercial catches. Some black rockfish is also landed as bycatch in other fisheries (Ruccio et al. 2004). Trip limits in the Kodiak District for black rockfish are 5,000 pounds per five day harvest and landing (Table 31). Vessel operators must register specifically for the black rockfish fishery in this district. No trip limits are imposed in the Chignik or South Alaska Districts of the Westward Region (Table 32).

When black rockfish are caught as bycatch in federal fisheries, they are able to be retained (subject to the state MRAs) and the amount retained is counted against the GHL. Management measures in place for directed black rockfish fishing include GHLs which are established by State regulatory area (Figure 18), logbook requirements and daily and weekly trip limits depending upon the area specific regulations (Table 31). These measures are strictly enforced with fines levied if they are violated. Management of GHLs in the westward region is on very small spatial scales. Figure 18 shows the overall areas (Kodiak, Chignik and South Alaska Peninsula) as well as the smaller districts within each area. For the Kodiak area, separate GHLs are established for each of the 7 districts. In the Chignik area the GHL is managed area-wide with the provision that no more than 45,000 lbs can be taken from any Chignik District. The South Alaska Peninsula GHL was originally established at 100,000 lbs area-wide with a similar provision for no more than 45,000 lbs from any one District and was reduced in 2006 to 75,000 lbs with the 45,000-lb restriction then removed. This reduction was based upon the maximum allowable catch in the Shumagin region where the majority of the catch in the District was believed to be occurring.

GHLs are established by State area management staff annually and are formulated such that they can be expeditiously reduced should information indicate that this is necessary. If an area is closed due to reaching the GHL, black rockfish goes on bycatch status in that area. If the State bycatch level is then exceeded a ticket can be issued in case of violation.

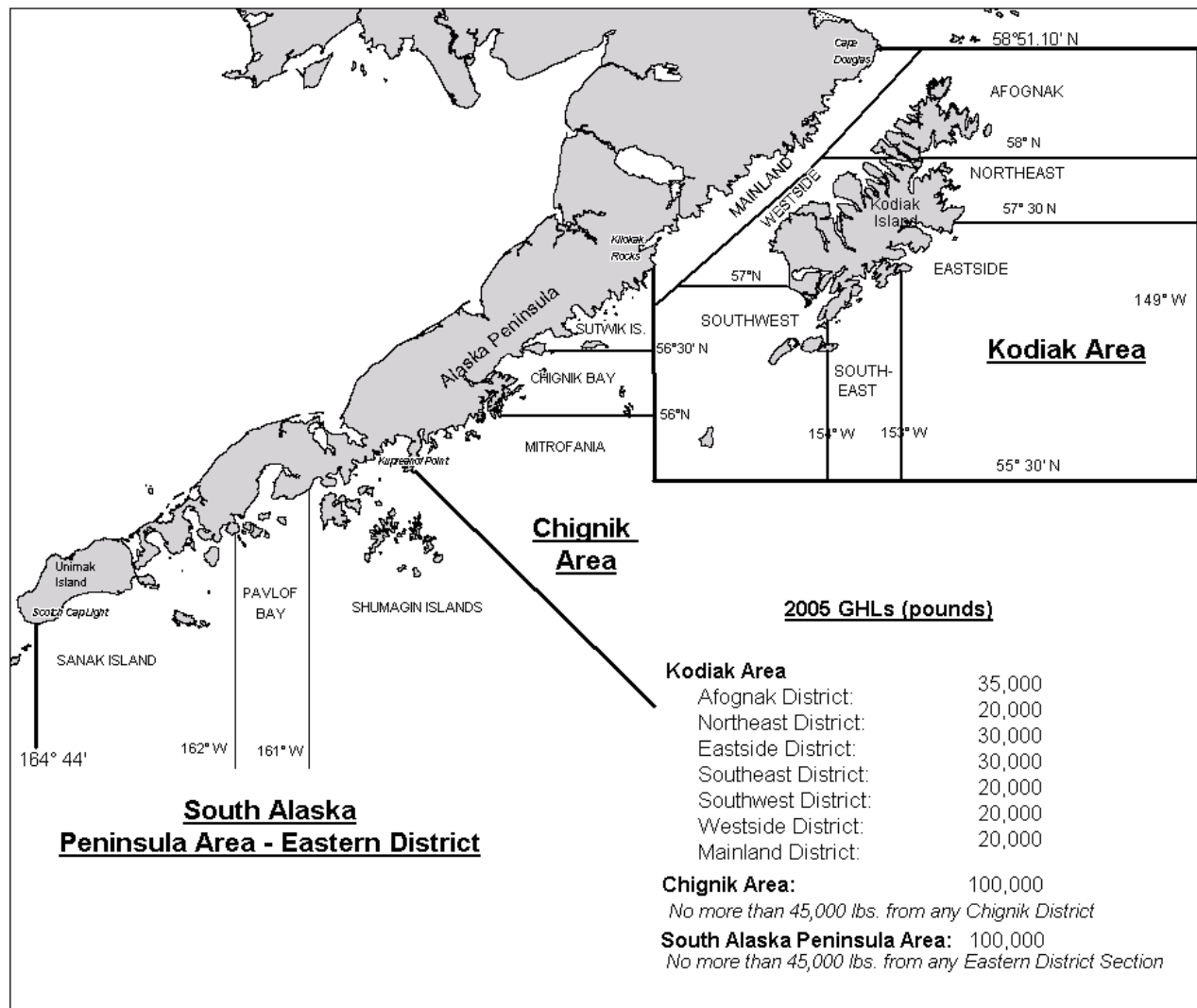


Figure 18 Kodiak, Chignik, and South Alaska Peninsula black rockfish management areas and districts, 2005. Note that the GHL for the South Alaska Peninsula Area in 2006 was reduced to 75,000 lbs and is no longer restricted by District (from Mattes and Spalinger, 2006).

Black rockfish harvest from the overall areas and districts in the Kodiak, Chignik and South Peninsula areas for 2005 are shown in Table 33. Some Kodiak districts closed early due to reaching or approaching their GHL while other district GHLs were not realized. Areas that closed due to achieving their GHLs were then restricted to a 5% bycatch limit in non-directed fisheries (Mattes and Spalinger, 2006). Limited effort occurred in Southwest, Westside, or Mainland Districts which is consistent with previous years (Mattes and Spalinger, 2006). Single-species registration and trip limit requirements were implemented in 2003. These requirements, in conjunction with lower ex-vessel prices and higher fuel costs are believed to be resulting in lower effort and harvest (Mattes and Spalinger, 2006). Many black rockfish landings are made in conjunction with fishing for Pacific cod during the State-waters fishery.

Table 33 Black rockfish harvest from the Kodiak, Chignik, and South Alaska Peninsula Areas, 2005 (from Mattes and Spalinger, 2006).

Area/District	Guideline	Total Harvest ^a	Directed Fishery Closure Date	Pounds	
	Harvest Level			Directed Harvest ^b	Incidental Harvest
Kodiak Area					
Afognak	35,000	33,011	August 2	32,930	80
Northeast	20,000	20,611	May 25	20,563	49
Eastside	30,000	34,354	July 5	34,092	262
Southeast	30,000	28,183	August 2	28,030	153
Southwest	20,000	71	December 31	0	71
Westside	30,000	1,265	December 31	1,265	0
Mainland	20,000	0	December 31	0	0
Total (Kodiak Area)	185,000	117,188		116,879	615
Chignik Area					
Sutwik Island	45,000 ^c	38,945	December 31	38,945	0
Chignik Bay	45,000 ^c	1,532	December 31	1,532	0
Mitrofanina	45,000 ^c	9,326	December 31	9,244	82
Total (Chignik Area)	100,000	49,803		49,721	82
South Alaska Peninsula Area					
Shumagin Islands	45,000 ^c	23,881	December 31	22,807	1,075
Pavlof Bay	45,000 ^c	37,665	December 31	37,573	92
Sanak Island	45,000 ^c	85	December 31	0	85
Total (South Peninsula Area)	100,000	61,632		60,380	1,252

^a Includes incidental harvest.

^b Based on vessel being registered for directed fishing, not actual pounds landed.

^c Each district in the Chignik and South Alaska Peninsula Areas is capped at \leq to 45,000 pounds; the total GHL is 100,000 pounds for the area.

Table 34 Catch and effort, excluding discards, for the Kodiak Area black rockfish fishery 1998-2004 (from Sagalkin and Spalinger 2005)

Year	Vessels	Number of Landings	Directed GHL	Total Harvest (lbs)	Price per pound
1998	76	355	190,000	195,623	0.32
1999	84	316	185,000	131,986	0.40
2000	92	282	185,000	255,044	0.41
2001	55	194	185,000	220,825	0.40
2002	41	143	185,000	204,547	0.43
2003	49	106	185,000	85,362	0.36
2004	52	140	185,000	123,231	0.36

Catch and effort data for the Kodiak District from 1998-2004 are shown in Table 34. A total of 76 vessels harvested 231,555 pounds (105 mt) of black rockfish from the combined Kodiak, Chignik and Eastern District of the South Alaska Peninsula Area in the 2004 fishery (Sagalkin and Spalinger 2005). Of those participating, 31 vessels harvested black rockfish in the directed commercial fishery with jig gear while the remainder landed it as bycatch in other fisheries (Sagalkin and Spalinger 2005). The majority of the harvest was from the Kodiak District.

There are currently no regulations for dark rockfish caught as bycatch in the black rockfish fishery and these fish are not identified to species level on fish tickets. Fish ticket records are aggregated with dark rockfish and dusky rockfish together. While catch accounting for dark rockfish is not yet required, some information is available on species identification at processors as well as from recent dockside sampling efforts and logbook data in some regions.

Canneries processing black rockfish in Kodiak in 2003 noted that increased sorting efforts for dusky and dark rockfish led to estimates that many deliveries that were close to 5,000 pounds total for all rockfish species often contained ¼ to ½ “dusky” rockfish (combined light and dark dusky rockfish species) once sorted (Ruccio et al. 2004). Total harvest in 2003 as reported on fish tickets for Kodiak, Chignik and South Alaska Peninsula areas for black rockfish was 141,265 pounds and for combined dusky rockfish species 17,967 pounds. The majority of the dusky rockfish harvest (17,910 of the total 17,967 pounds) was taken in the Kodiak District.

Dockside sampling efforts have increased in recent years and samplers have collected a range of data in addition to fish ticket records, fishing locations and effort. Recently data has been collected during the black rockfish jig fishery on fish length, sex, reproductive maturity, and otoliths for aging (Sagalkin and Spalinger 2005). Species composition data from dockside sampling in Kodiak indicates that the percentage of black rockfish identified as darks is higher in recent years (Figure 19 and Figure 20).

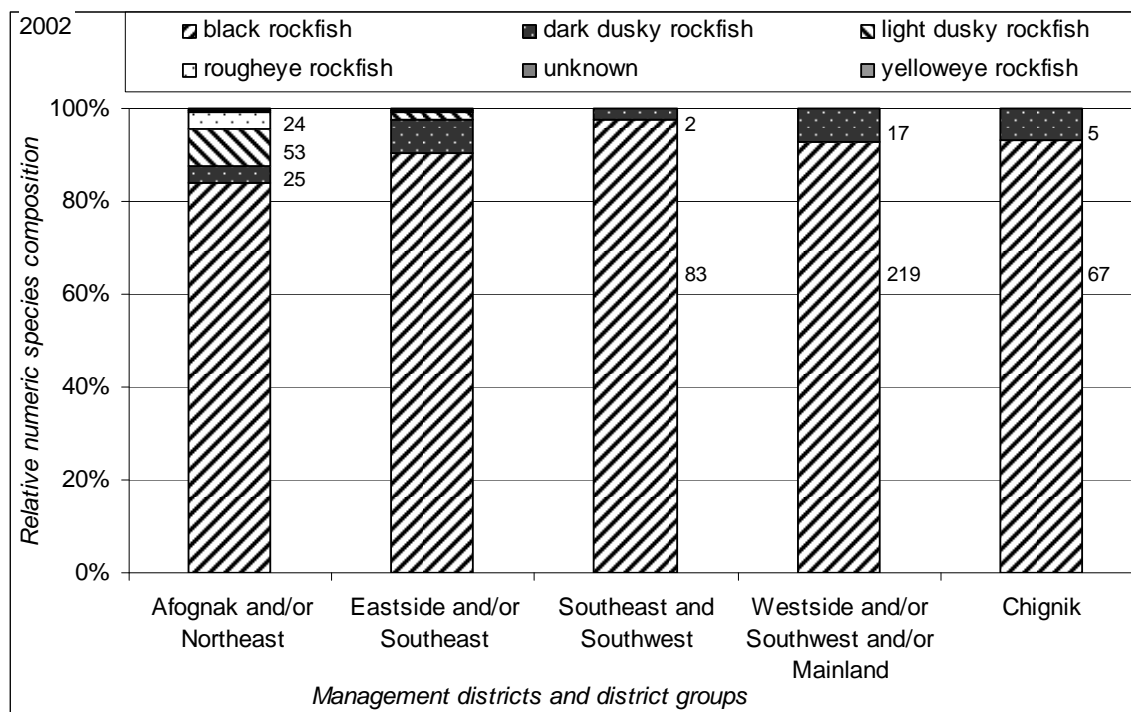


Figure 19 Percent species composition landed in the Kodiak Black rockfish jig fishery by district 2002 (Source ADF&G) Numbers next to bars are total sample sizes in each species category.

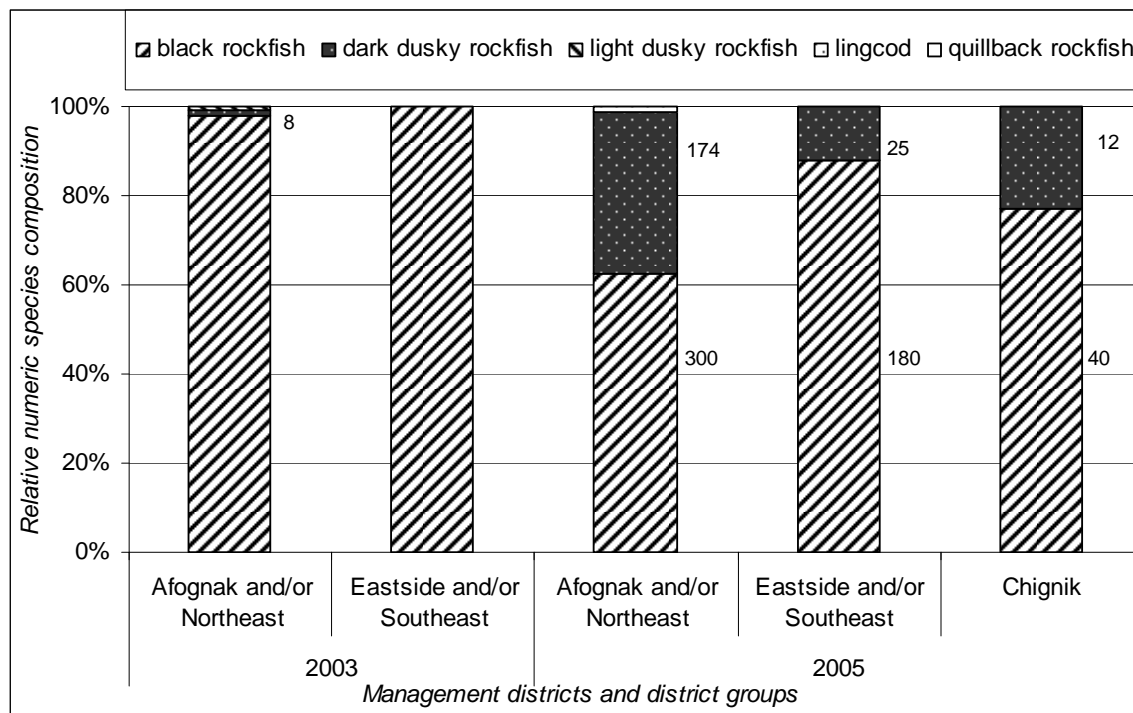


Figure 20 Percent species composition landed in the Kodiak Black rockfish jig fishery by district 2003, 2005 (Source ADF&G). Numbers next to bars are total sample sizes in each species category.

Percent species composition landed in the directed black rockfish jig fishery from dockside sampling in the Westward Region are shown in figures 19 and 20. In all areas and years the catch is predominantly black rockfish, however in 2005 a substantial proportion of the catch was dark rockfish (Figure 20). Note that this is the same year where the Federal trawl survey data showed a high biomass of dark rockfish (largely from one tow near the Shumagins).

Generally processors offer less money for dark rockfish than for black rockfish, thus there is limited incentive for the fishermen to separate the two species (N. Sagalkin pers. comm.). Fish tickets do not differentiate between the two species however, thus catch records show these fish as “dusky rockfish”. Logbook records since 2005 do differentiate by species and bycatch data from these logbooks have been summarized from the Kodiak region for 2005 and 2006. These data show a high proportion of dark rockfish caught in the black rockfish fishery (Table 35). Breaking out the bycatch numbers by area shows that a high proportion of the total bycatch in 2005 of dark rockfish came out of the Afognak area of Kodiak District (Table 36). The total bycatch in 2005 of darks represents 19% of the catch (in numbers) of black rockfish, while the individual total from the Afognak region represents 40% of the catch (in numbers) of black rockfish. This is currently underreported for darks in the Federal fishery as described above given that catch record show these two species together and labeled only as dusky rockfish. These fish are accounted for (in aggregate and recorded as dusky rockfish) under the PSR TAC. The number of dark rockfish identified as bycatch in 2006 was substantially less than in 2005 (Table 35, 36).

Table 35 Total Kodiak District Rockfish catch and retained bycatch from logbook data for the Black Rockfish fisheries

Year	Number of fish		
	Black Rockfish	Dark Rockfish	Dusky Rockfish
2005	20,728	3,944	4,269
2006	15,922	1,491	2,423

Table 36 Rockfish catch and retained bycatch from logbook data for the Black rockfish fisheries from 3 sections (2005, 2006)

	2005 Num. of fish per section		
	Afognak	Northeast	Eastside
Black Rockfish	6,760	5,472	6,128
Dark Rockfish	2,722	417	710
Dusky Rockfish	2,464	1,501	214
	2006 Num. of fish per section		
	Afognak	Northeast	Eastside
Black Rockfish	4,199	2,349	3,977
Dark Rockfish	322	323	429
Dusky Rockfish	1,564	70	402

Similar logbook data are not available for the South Alaska Peninsula Area. There is a logbook requirement but compliance with this has been poor and there has been limited directed effort recently (K. Spalinger, pers. comm.). A research survey in 2004 in the Shumagins area using a chartered jig vessel caught approximately 900 black rockfish and 434 dark rockfish, which could show an indication of the species composition in that region (D. Urban pers. comm.). The Shumagins are also the region of the high biomass estimates from tows in the trawl surveys in 1999 and 2005 (Figure 7e).

3.4.1.2 Black Rockfish Fishery Cook Inlet

The Cook Inlet Area includes the waters west of Cape Fairfield and north of Cape Douglas. It is divided into the Cook Inlet and North Gulf Districts. The Cook Inlet District includes the waters of Cook Inlet north of a line from Cape Douglas to Point Adam while the North Gulf District comprises the remaining waters of the management area, primarily the Gulf waters along the outer Kenai Peninsula (Trowbridge and Bechtol, 2004).

The GHLL for the Cook Inlet region is an aggregate for all rockfish species (including black rockfish since 1998) and is currently established at 150,000 lbs. The season opens on July 1. There is a five-day trip limit imposed of 1,000 lbs for the Cook Inlet District and 4,000 lbs for the North Gulf District. Once the GHLL has been achieved a 20% bycatch limit is imposed (subject to the trip limits). Directed rockfish fisheries are restricted to jig gear.

The North Gulf District has yielded more than 95% of the commercial rockfish catch during any year while catch of pelagic rockfish species and particularly black rockfish have comprised more than 50% of the harvest in most years (Trowbridge and Bechtol, 2004). In 2004, black rockfish harvest (74,048 lb) accounted for about 80% of the directed rockfish catch.

Information from ADF&G has previously indicated that as much as 25% of the fish reported as black rockfish caught in the Kenai Peninsula jig fishery may have actually been dark rockfish (Lunsford et al 2005). Preliminary data from the Cook Inlet management region also shows the proportion of dark rockfish in the landed black rockfish catch (Table 37). The relative proportion of dark rockfish in the

catch has ranged from 0.9 to 5.6%. The lower rates of 0.9 in 2001, as compared to the following three years, may be due to the higher relative percentage of unidentified dusky rockfish in that year that were likely dark rockfish (Table 37).

Table 37 Species composition of pelagic shelf rockfish sampled in the Cook Inlet Area jig fishery and surveys 2001-2004.

Species	2001	2002	2003	2004	Ave (01-04)
Black rockfish	94.4	94.7	93.5	96.4	94.5
Unspec. Dusky rockfish	4.3	0.5	0.2	0.0	1.9
Dark rockfish	0.9	4.2	5.6	3.3	3.0
Dusky rockfish	0.4	0.7	0.8	0.3	0.5

Source: W. Dunn, ADF&G preliminary data

Dockside sampling data in the 2004 fishery for the Cook Inlet Area indicated that from a total of 672 rockfish sampled in the ports of Homer and Seward, species composition were 79% black rockfish, 7% dusky rockfish, 1% quillback rockfish and 13% yelloweye rockfish (Trowbridge and Bechtol 2004). Dusky rockfish were not separated into dusky and dark by species. Of the samples collected 87% came from the directed jig fishery.

3.4.1.3 Black Rockfish Fishery Southeast

There has been black rockfish fishing in Southeast, on and off, since the late 1970's. During the 1990s there was a fishery in the Sitka area, with a single operator providing most of the effort. In addition, black rockfish have been taken as incidental bycatch in salmon troll and net fisheries, sport fisheries, and longline fisheries. The harvest history and geographic distribution of catch from 1985-2001 are shown in (Figures 21 and 22). This includes all catch (including incidental catch).

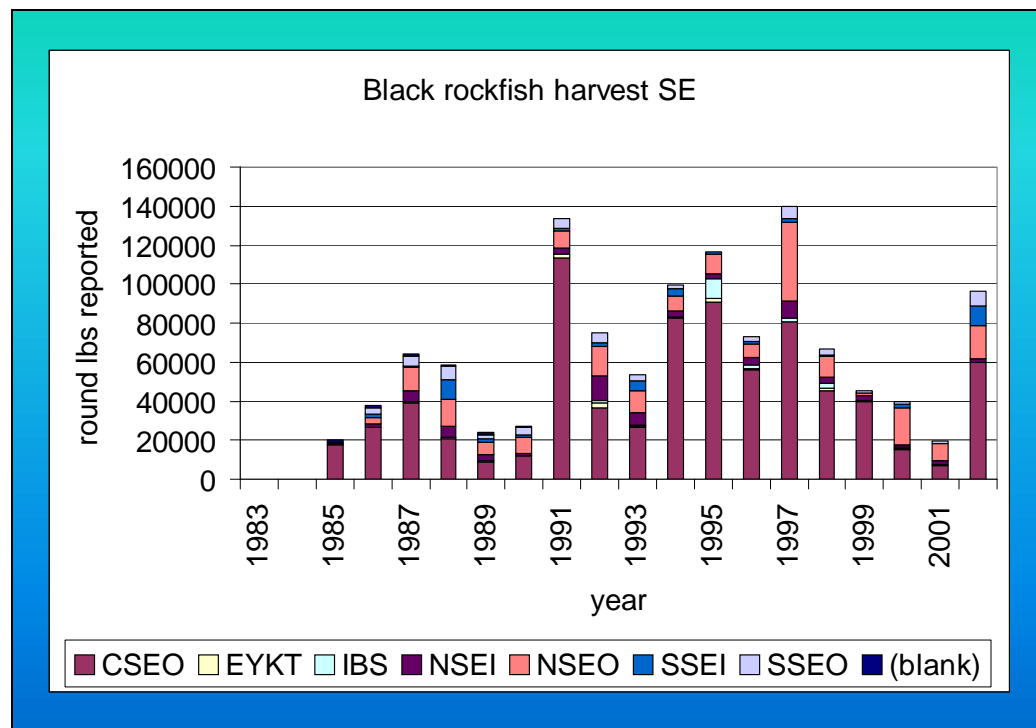


Figure 21 Black rockfish harvest in Southeast 1985-2002

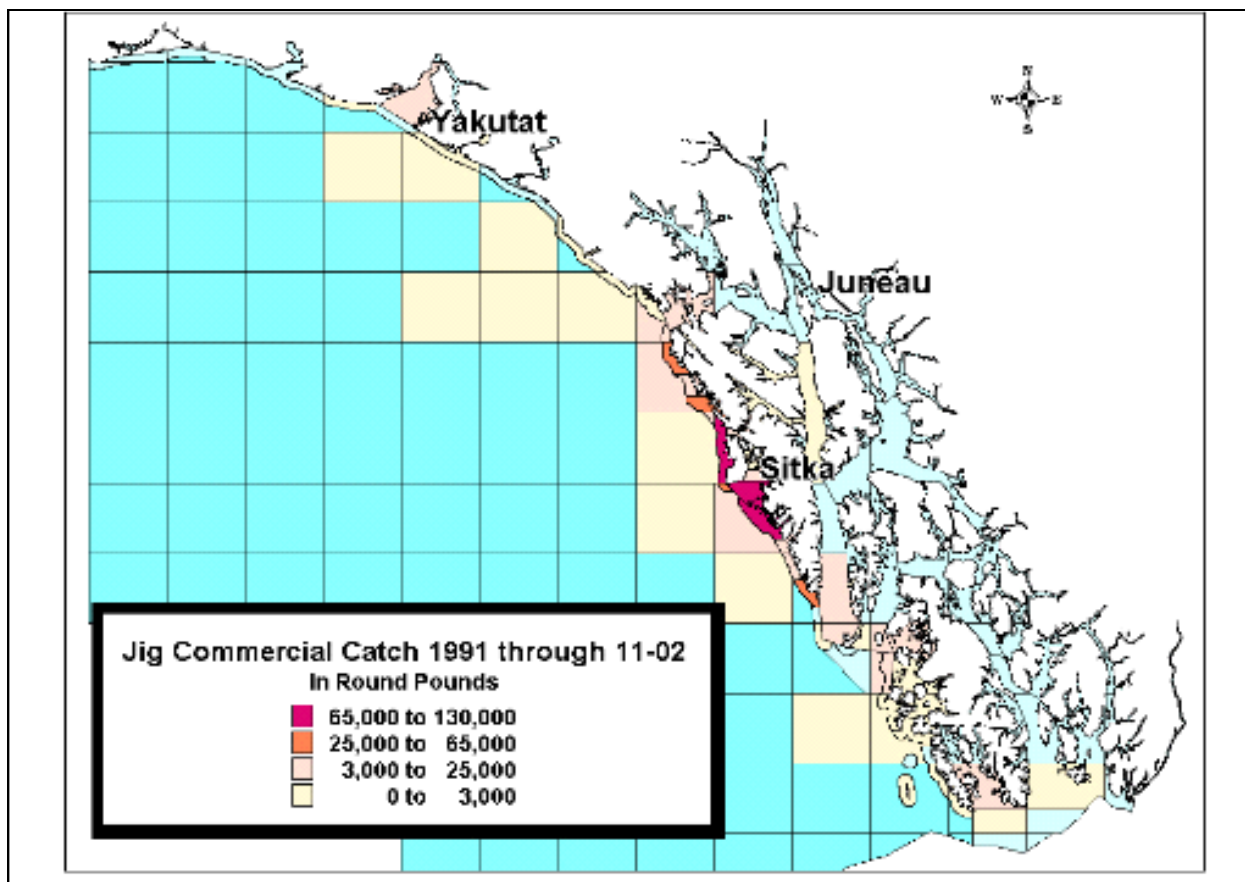


Figure 22 Commercial catch by region of Black rockfish in Southeast

There are currently no ADF&G on-board observer programs conducted in the Southeast Region that monitor catch or bycatch of black rockfish. However port sampling is conducted for some fisheries which catch black rockfish, including directed fisheries for black rockfish and fisheries such as demersal shelf rockfish and lingcod.

The state requires full retention of black rockfish within 0-3 miles of shore in conjunction with groundfish fishing and halibut fishing (all gear types).

Although some research was conducted in Southeast toward developing a stock assessment approach for black rockfish, there is currently no active stock assessment program for black rockfish beyond catch accounting and collection of some biological data from port sampling.

3.4.2 BSAI black rockfish fishery

State waters of the Aleutian Islands District and the Western District of the South Alaska Peninsula Registration Area are managed jointly for black rockfish (Figure 23). This area consists of all waters south of a line extending west from Cape Sarichef (54 ° 36' N. lat) and west of a line extending south of Scotch Cap Light (164 ° 44' W. long.). For management purposes this is referred to as the Aleutian Islands black rockfish fishery. In the AI, the commercial fishery for black rockfish opens in all areas on January 1st and remains open until December 31, or until GHs are attained (Mattes and Failer-Rounds

2005). Harvests are monitored through fish ticket records, processor reports and dockside sampling of commercial catches.

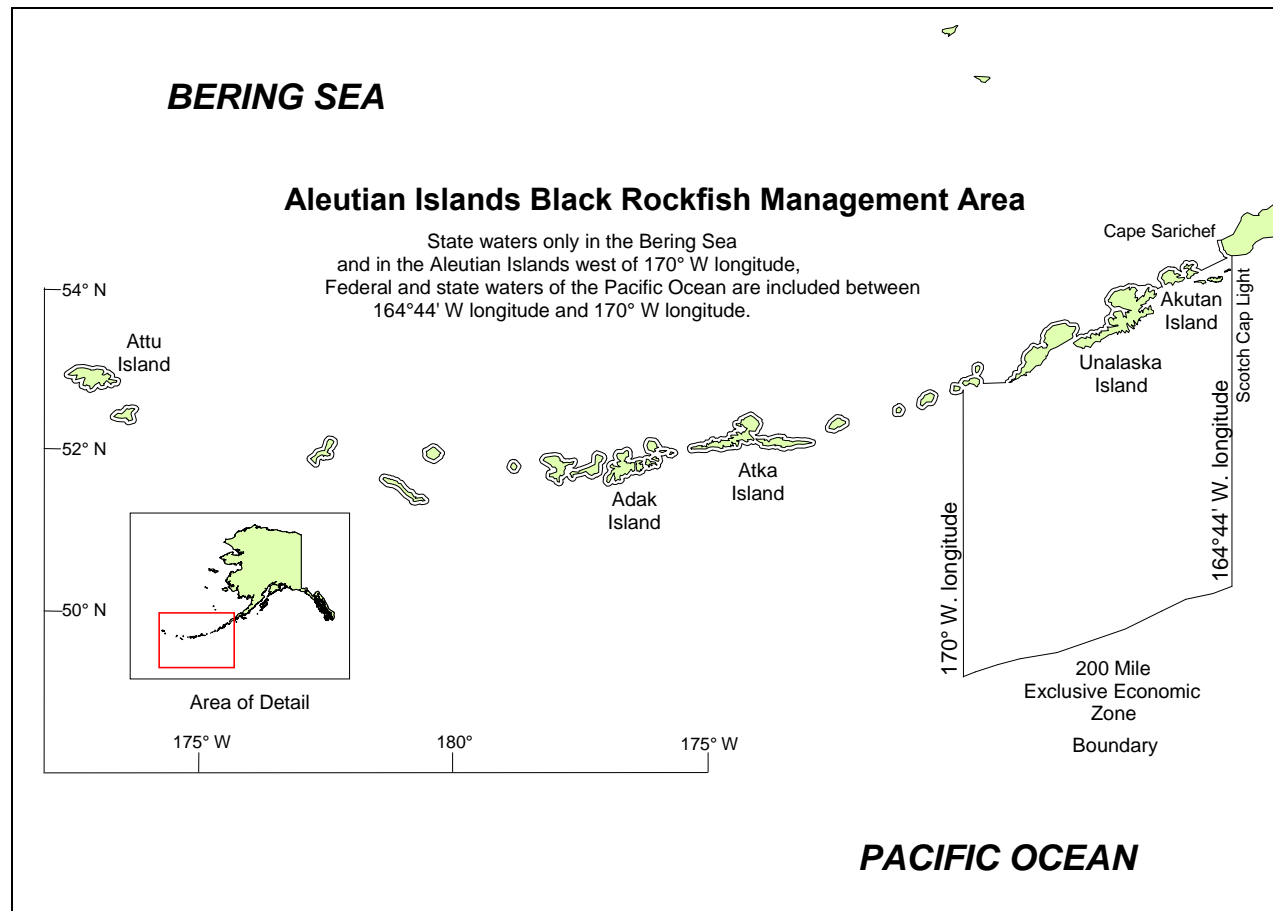


Figure 23 The Aleutian Islands state-waters black rockfish management area (from Mattes and Failor-Rounds, 2005).

Within this region, smaller subsections are managed with individual GHLS established by subsection (Figure 24). The AI GHL for black rockfish was 100,000 pounds from 1994-1998 and 90,000 pounds from 1999-2006. GHLS by subsection are shown in Table 38.

Table 38 Section Guideline Harvest Levels (GHLS) in the Aleutian Islands.

<u>Akutan Section</u>		
Akutan Island Subsection	10,000	
Akun Island Subsection	10,000	
Rootok Island Subsection	5,600	
Tigalda Island Subsection	9,400	
TOTAL	35,000	Pounds
<u>Unalaska Section</u>		
Unalaska Bay/ Wislow Subsection	3,000	
Cape Kalekta/Unalga Island Subsection	3,600	
West Unalaska Subsection	12,850	
South Unalaska Subsection	12,300	
Beaver Inlet/Sedanka Island Subsection	3,250	
TOTAL	35,000	Pounds
<u>Western Section</u>		
(no subsections)	20,000	Pounds

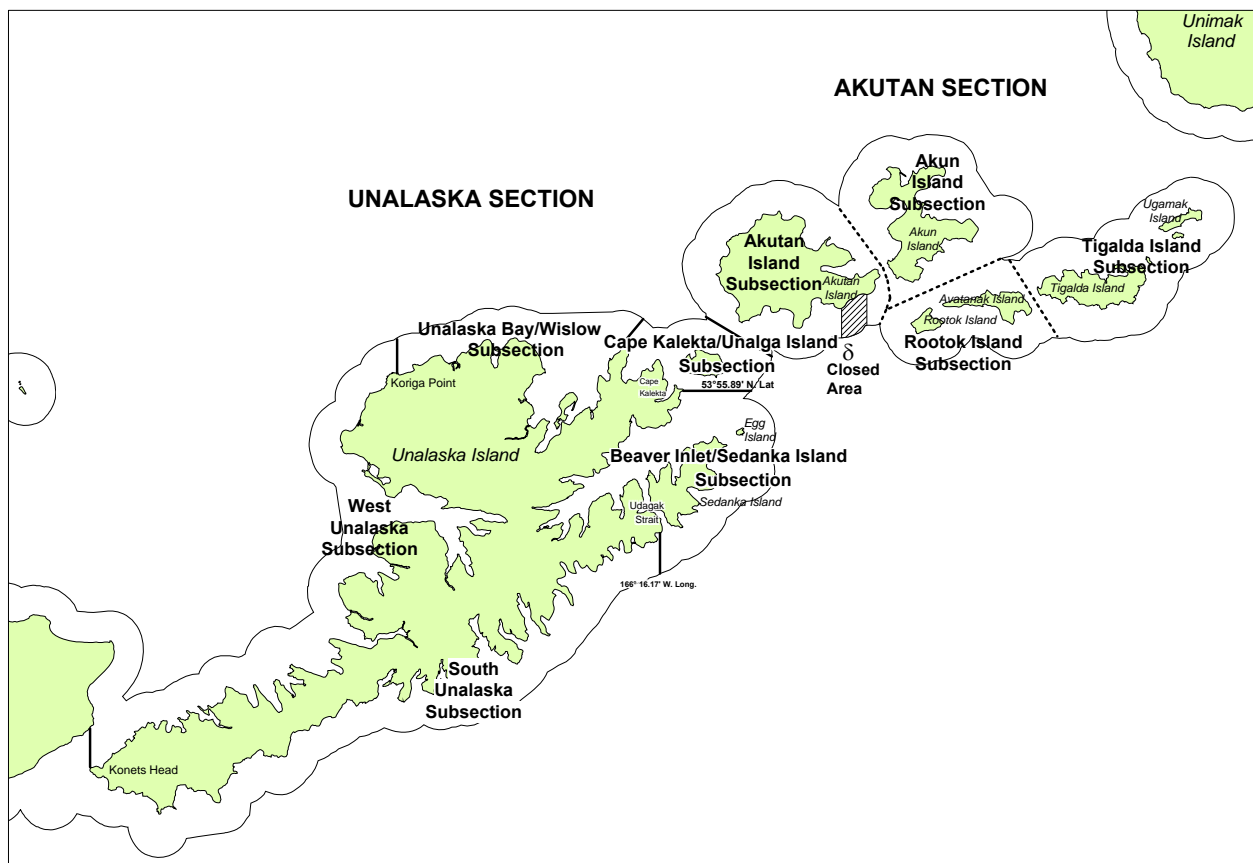


Figure 24 Subsections of the Unalaska and Akutan Sections of the Aleutian Islands Registration Area state-waters black rockfish fishery (from Mattes and Failor-Rounds, 2005)

Harvest has been far below the GHL in recent years. Landings and vessel participation are listed in Table 39. Most year’s landing information cannot be shown due to confidentiality restrictions.

Table 39 Black rockfish landings (in pounds) in the State Aleutian Islands fishery 1997-2006

Aleutian Islands Black Rockfish

Year	Round Pounds	Unique Vessel Count	No. of Landings
1997	102,588	5	20
1998	confidential	confidential	confidential
1999	21,522	11	44
2000	confidential	confidential	confidential
2001	confidential	confidential	confidential
2002	confidential	confidential	confidential
2003	confidential	confidential	confidential
2004	2,801	15	34
2005	6,090	9	21
2006	confidential	confidential	confidential
	confidential	confidential	confidential

Dockside sampling data are not available for the black rockfish fishery in the Aleutian Islands thus the possible percentage of landings of dark rockfish in the black rockfish fishery are unknown. Bycatch information is available from 1997-2005 (ADF&G unpublished data). These data show variable dusky rockfish bycatch by year for the directed black rockfish fishery. However as the dusky rockfish represents an aggregate of dark rockfish and dusky rockfish and no dockside sampling is available to approximate species composition it is not possible to approximate the amount of dark rockfish landed in the AI black rockfish fishery at this time.

4.0 ENVIRONMENTAL IMPACTS

This EA focuses on the specific impacts of the proposed action and provides details concerning the proposed action and its impacts. This analysis focuses on the environmental components that could potentially be affected by this action; dark rockfish and other targeted groundfish species in the GOA PSR and BSAI “other rockfish” complex. Social and economic impacts of the proposed action are discussed in Chapters 5 and 6 of this EA/RIR/IRFA.

Due to the nature of this action, removing a minor rockfish species from the GOA and BSAI Groundfish FMPs, no effects are expected on the physical environment, benthic community, non-target species, marine mammals, seabird, and ecosystem components of the environment. No effect is presumed for these components because current fishing regulations (e.g., season and gear types), harvest strategies, or regulations protecting habitat and important species, as described in the Groundfish EIS (NMFS 2007), would not be changed by any of the alternatives.

4.1 Alternative 1: Status quo

4.1.1 Impacts on GOA Pelagic Shelf Rockfish Stocks

Under alternative 1, Status Quo, there would be no change to the management of the pelagic shelf rockfish complex. Total catch is expected to be the same and the distribution of catch is not expected to change. Complex-level ABCs, OFLs and TACs would continue to be specified. As the TAC for the complex as a whole is largely based upon the biomass of dusky rockfish, the dark rockfish stock would continue to be at risk for potential overfishing under this relatively high complex-level TAC. One change that is anticipated under the status quo alternative is that catch accounting would begin to identify dark rockfish in the catch records due to the segregation of dark and light dusky by species. Catch information for dark rockfish will improve. However no management measures to restrict the harvest of dark rockfish will be taken.

4.1.2 Impacts on Other GOA Groundfish Stocks

Under alternative 1, Status Quo, there would be no change to management of the pelagic shelf rockfish complex, thus there is no anticipated change in the impact of this fishery on other groundfish stocks. Bycatch in the PSR fishery includes northern rockfish and species in the “other slope” rockfish complex (see Section 3.2 for more information). The pelagic shelf rockfish fishery will continue to concentrate on dusky rockfish and relative bycatch of species is unlikely to change.

The impact on the State-managed black rockfish fishery is unlikely to change under current management of the pelagic shelf rockfish complex. Dark rockfish will likely continue to be caught in conjunction with the black rockfish fishery. Under the current management system there is limited incentive to report dark rockfish landings as separate from black rockfish landings. With the separation of dark and dusky rockfish by species, State reporting codes will change (as with Federal) and improved information on dark rockfish information is likely.

4.1.3 Impacts on BSAI “Other Rockfish” Stocks

Under alternative 1, Status Quo, there would be no change to the management of the “other rockfish” complex. Complex-level ABCs, OFLs and TACs would continue to be specified. The TAC for the complex as a whole is largely based upon the biomass of shortspine thornyhead and dusky rockfish, with limited contribution from the dark rockfish stock. One change that is anticipated under the status quo alternative is that catch accounting would begin to identify dark rockfish in the catch records due to the segregation of dark and light dusky by species. Catch information for dark rockfish will improve. However no management measures to restrict the harvest of dark rockfish will be taken.

4.1.4 Impacts on Other BSAI Groundfish Stocks

Under alternative 1, Status Quo, there would be no change to management of the “other rockfish” complex, thus there is no anticipated change in the impact of this fishery on other groundfish stocks.

The impact on the State-managed black rockfish fishery is unlikely to change under current management of the “other rockfish” complex. Dark rockfish will likely continue to be caught in conjunction with the black rockfish fishery. With the separation of dark and dusky rockfish by species, State reporting codes will change (as with Federal) and improved information on dark rockfish information is likely.

4.2 Alternative 2: Remove Dark Rockfish from FMPs

4.2.1 Impacts on GOA Pelagic Shelf Rockfish Stocks

Alternative 2, transferring dark rockfish to State management by removing it from the Federal FMP, is anticipated to result in better management of the dark rockfish stock. Currently dark rockfish are managed under a relatively high complex-level TAC which is set primarily for dusky rockfish. If dark rockfish are removed from the pelagic shelf rockfish complex, the State will manage them as a single stock in State and Federal waters. The majority of the dark rockfish stocks are presumed to be located in near-shore, shallow waters. The biennial trawl survey conducted by NMFS does not adequately assess this habitat and thus does not adequately assess the biomass of dark rockfish stocks.

Dark rockfish are caught infrequently in the Federal PSR fishery but more frequently in the State jig fishery. Under State management, dark rockfish would be assessed and managed as a single stock and the potential would exist to manage on smaller regions than the Federal management of the complex. There would be a decrease in the overall annual ABCs (and TACs) for the pelagic shelf rockfish complex as a result of no longer including the fractional amount of biomass contributed by the dark rockfish stock.

In recent years (with the exception of 2005) this decrease in the overall ABC (and TAC) has been less than 2% (Table 40). As discussed in Sections 3.1 and 3.2, the ABC and TAC for the complex is primarily based on the much larger biomass of dusky rockfish thus the contribution from dark rockfish is very low in most years. Widow and yellowtail rockfish would continue to be managed within the pelagic shelf rockfish complex and the relative contribution to the ABC from these stocks will continue to be incorporated into the PSR ABC.

Table 40 ABC for the pelagic shelf rockfish complex 2002-2006 and the relative contribution from the dark rockfish stock to the overall complex ABC

Year	PSR ABC	Dark rockfish ABC (mt)	% contribution to ABC
2002	5,490	90	1.64
2003	5,490	90	1.64
2004	4,470	88	1.99
2005	4,553	88	1.93
2006	5,436	436	8.02

As discussed in section 3.1, the trawl survey biomass estimate for dark rockfish in 2005 was much higher than previous years (12% of the 2005 biomass estimate was made up of dark rockfish). Again, this was due to one abnormally large tow in the survey. The ABC is based upon a three survey average due to fluctuations in biomass from one survey to the next (Lunsford et al. 2005). Thus, even with the three survey average taken into consideration, the percent contribution to the ABC in 2006 from dark rockfish is 8%.

In Federal fisheries, the retention of dark rockfish by State- permitted vessels would be controlled by the State MRAs or bycatch limits. Since historic catches are approximately 1 percent or less of pelagic shelf rockfish catch, it is unlikely that these MRAs would compel substantial discarding or reduce catch. The State MRAs would prevent targeting of dark rockfish, which could occur under current rules. In other directed fisheries, discards of dark rockfish required by the MRA are likely to be minor, as catch of the species is relatively small relative to target catch. If a GHL were established by the State then catch in Federal waters would be accounted for under the State GHL.

Under this alternative the State would assume all management responsibilities for dark rockfish. The degree to which transfer of management responsibility from Federal to State government might be an improvement for dark rockfish would probably vary among the State's three regions - the Southeast, Central and Westward Regions - which have significant management responsibility for marine fisheries. For all regions the primary potential improvement for the management of the species would arise from the State's ability to regulate fisheries (e.g. openings and closings, area closures, etc. through the release of Emergency Orders) on much shorter notice, over smaller geographic areas, and with less supporting data than is readily implemented under Federal management.

A comparison of the Central GOA management area with the State management areas in the Kodiak and Chignik regions can be used to contrast the relative difference in spatial scales of management between State and Federal areas. The CGOA comprises management areas 620 and 630 (Figure 27). Under current management an apportionment of the complex-level TAC for PSR is established for the CGOA area. Any catch of PSR species in areas 620 and 630 accrues to this TAC. The directed fishery (regardless of which species in the complex is harvested) is open until the full TAC is achieved. Generally the catch composition is made up of dusky rockfish (the target fishery of the complex). If an unusually high catch of dark rockfish were recorded within the CGOA area, this would likely be noted by in-season management and monitored accordingly. However, the TAC is specified for the complex, and the complex TAC is managed across 620 and 630 combined, thus despite any possible conservation concern that could be raised by high catches of dark rockfish periodically, management measures to close areas and fisheries are very limited.

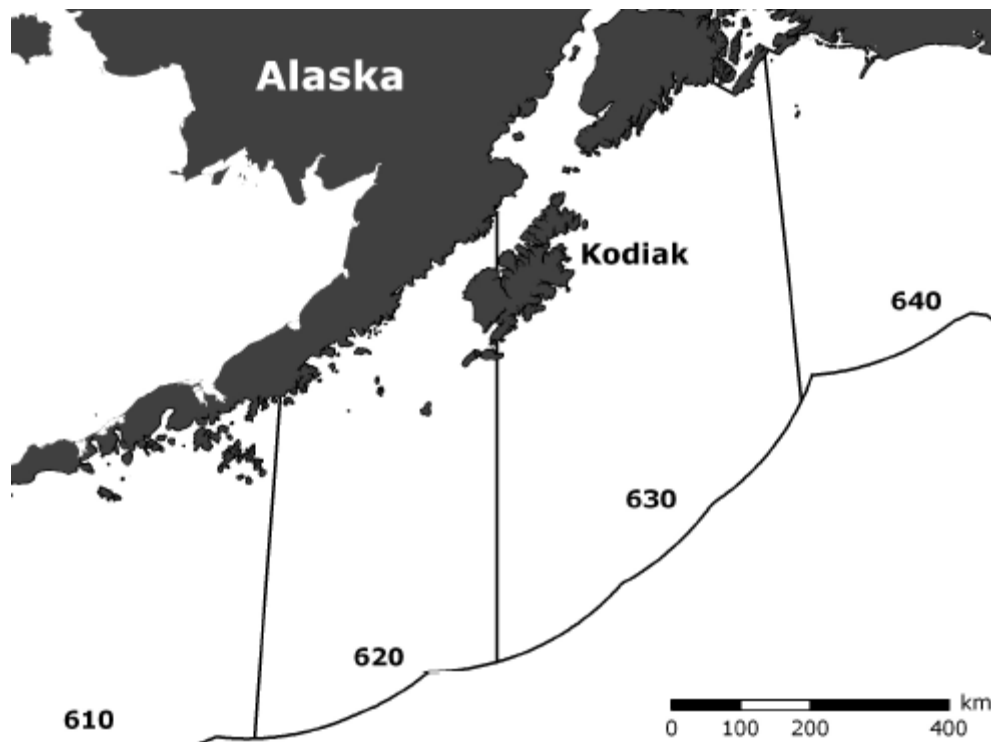


Figure 25 NMFS reporting area for Central GOA areas 620 and 630

In contrast to this, State management is on much smaller spatial scales with a greater ability to respond in-season to close or restrict harvest in these regions. Figure 28 shows the State management areas for Kodiak, Chignik and South Alaska Peninsula East and their associated smaller districts. For comparison with the Central GOA management area (620 and 630), these State areas comprise area 620 and a portion of 630 and contain 13 individually managed sub-areas as compared with one single federal management area. GHs (for instance with black rockfish) are specified by area and in some regions on smaller scales by district. Individual districts are managed for harvest by GHs, trip limits and allowable bycatch amounts. Dark rockfish are known to be highly patchily distributed, and the State has a greater ability to respond to smaller scale management issues given the relative scale of each management region.

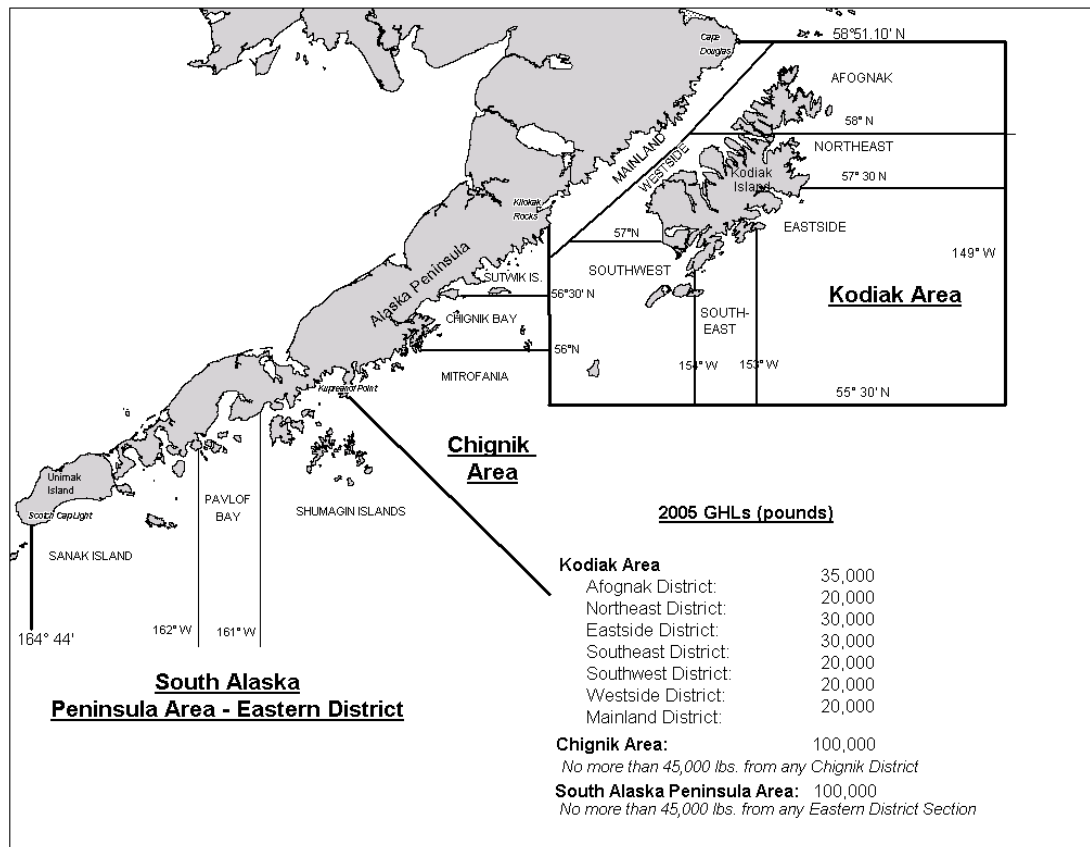


Figure 26 Kodiak, Chignik and South Alaska Peninsula East Areas and Districts (in conjunction with black rockfish 2005 GHLS)

Overall landings of dark rockfish in the CGOA are approximated by using the total PSR catch in 2005 and 2006 and applying the approximate percentage of dark rockfish landings (from Table 25) from observer data for the gulfwide complex catch in 2005 (Table 41).

Table 41 Estimated dark rockfish catch in mt approximated from the overall CGOA PSR catch and the estimated gulfwide dark rockfish percentage of the observed catch from 2005

Year	Total PSR catch in CGOA (mt)	Estimated contribution from dark rockfish (mt)
2005	1,897	20.9
2006	1,713	18.8

In comparison to this, dark rockfish landings in the black rockfish fishery are calculated from logbook data in the Kodiak Area (Table 41). These landings are approximated for dark rockfish using the number of fish from the logbook data and extrapolating those fish to weight in metric tons by applying an average weight of dark rockfish from survey data. Thus this is only an approximate measure of the relative landed weight of dark rockfish in comparison to the actual landed weight of black rockfish for the same year. These estimates however show both the high percentage of dark rockfish that are being landed in the black rockfish fishery, as well as how these compare with the overall approximation of CGOA dark rockfish landings. It should be noted that the dark rockfish landings in the black rockfish fishery are not being reported as such on fish tickets but are instead being reported as dusky rockfish. These data as shown in Table 42 are for the Kodiak area only, and similar data are not available for other regions of the State. It does, however, provide an estimate of the relatively high landings of dark rockfish in

conjunction with black rockfish that are not currently being reported by species. Should the State take over management of dark rockfish, any management measures for the species could be applied on small area-specific regions as deemed appropriate by regional management staff. In the Kodiak Region it is likely that a directed fishery for dark rockfish would not be allowed but that bycatch of the species would be managed in conjunction with the black rockfish fishery (N. Sagalkin, pers comm.). If bycatch levels increased, management restrictions would be enacted to reduce it. Again due to the smaller scales of areas and regions these measures could be enacted on much smaller management regions than current Federal management allows (i.e., on the scale of CGOA only).

Table 42 Estimated dark rockfish catch (in mt) from the Kodiak Area from logbook data on numbers of fish and average weight of dark rockfish from survey data, as compared with black rockfish landings 2005, 2006

Year	Black rockfish (directed catch in mt)	Dark rockfish (bycatch in mt*)	% of dark rockfish to black rockfish
2005	41.86	4.65	11.11
2006	32.81	1.76	5.36

*approximated from numbers of landed fish using an average of survey weight of dark rockfish from 88 samples

In Southeast, dark rockfish would probably be managed as part of a complex that includes black rockfish and blue rockfish, for which there is a directed fishery. In the Central Region, dark rockfish would be managed as part of the fisheries (directed in the Cook Inlet Area; bycatch-only in the Prince William Sound Area) for a complex of pelagic shelf rockfish that also includes dusky, widow, yellowtail, black, and blue rockfishes. The PWS Rockfish Management Plan requires full retention of all rockfish caught; proceeds of the sale of any bycatch overage are to the State of Alaska. In the Westward Region (as described above for Kodiak), dark rockfish would probably be managed as a part of the directed black rockfish fishery.

In addition to the more readily implemented time and area closures and the lower threshold for data required to implement management action possible under state management, a variety of other state management methods might yield improved management of dark rockfish.

All three regions have logbook requirements that allow identification of amounts and locations of rockfish catch as well as providing data on fishery CPUE, discard and bycatch. This information can be used to take management actions such as implementation of time and area closures.

Gear restrictions would likely be implemented, such as the jig only restriction for directed black rockfish fisheries in the Alaska Peninsula and Kodiak Areas of the Westward Region, and the Cook Inlet Area of the Central Region. In general jig-only fisheries tend to proceed at a slower pace than trawl fisheries with commensurate reduction in the risk of large bycatch overages.

Further reduction in the risk of overfishing could be accrued through trip limits, such as those in the Central Region which mandate five-day trip limits for rockfish (4,000 pounds in the North Gulf District and 1,000 pounds in the Cook Inlet District). Additional action to reduce the risk of overfishing would include rockfish bycatch limits in other fisheries. As an example, in the Central Region during the open season, rockfish may be retained as bycatch to other directed fisheries. Rockfish bycatch is restricted to 10% (5% to Pacific cod jig fishermen), however, total bycatch may not exceed 20% of the gross round weight of all directed groundfish and halibut on board a vessel.

In all regions, black rockfish catch in excess of allowable bycatch limits must be reported as bycatch overage and all proceeds from the sale of excess rockfish bycatch is surrendered to the state. This

requirement tends to reduce any incentive to exceed bycatch limits. Similar regulations could be applied for the management of dark rockfish.

None of the regions currently conduct regular, fishery independent surveys for pelagic rockfish species such as black, blue or dark. Research is being conducted in the Westward and Central Regions to try to develop abundance estimation methods for black rockfish, and some limited fishery independent surveys have been conducted in conjunction with those developmental efforts. A similar effort was conducted in the Southeast Region – focusing on mark-recapture methods - but no satisfactory abundance estimation method was developed. Beyond these limited efforts, without the availability of additional stock assessment funds it is unlikely that the State will implement regular fishery independent surveys to assess abundance of any of the pelagic rockfish species in the near future. Similarly, the State does not now have, nor is it likely to implement in the foreseeable future, any regular, onboard observer coverage of vessels likely to catch black, blue, dark rockfish or any of the other pelagic rockfish species.

There is currently no observer coverage for black rockfish fisheries in state waters and there will likely be no such programs in the foreseeable future, whether or not the state takes on management responsibility for dark rockfish. Species composition of dark (and “other rockfish”) will be determined from catch records from fish tickets, port sampling and logbook data. Currently in the Federal fishery as noted in section 3.2 observer coverage is low and catch records depend upon fish tickets.

The state requires full retention of black rockfish within 0-3 miles of shore in conjunction with groundfish fishing and halibut fishing (all gear types). Full retention in federal waters would require implementation by NMFS. Absent a full retention requirement for federal waters, the state can not adequately monitor bycatch of dark rockfish in federal waters.

In all regions, the primary data used in support of management would include catch records from the fish ticket system, biological data obtained during port sampling and catch location, fishery CPUE, bycatch and discard data from mandatory logbooks.

If the state were to take on management responsibility for dark rockfish it would be logical to also expect the state to have timely access to federal trawl survey and observer data on dark rockfish which would presumably still be collected under these federal programs despite the transfer of management responsibility to the state. If the state did not have timely access to these survey and observer data it could compromise the ability of the state to effectively manage dark rockfish, despite the reported relatively limited occurrence of dark rockfish in the deeper waters from 3-200 miles offshore. If these data were not made available to the state – to supplement catch accounting, port sampling and logbook collection conducted directly by the state - the proposed transfer of management authority could result in no net benefit to the species and could conceivably degrade management of dark rockfish compared to the current federal management.

Beyond the management measures already implemented and mentioned for management of pelagic shelf rockfish (primarily black rockfish) in state waters, there would probably be little change in the way the state manages these rockfishes even if the state assumed management responsibility for dark rockfish.

Both Federal and State recordkeeping requirements would be adjusted to account for dark rockfish as a species separate from dusky rockfish. Catch information for dark rockfish will be improved by these changes in catch accounting. New reporting requirements will be necessary whether or not the Council chooses to move dark rockfish for State management. The State of Alaska reporting requirements and catch processing coding changes will also be necessary.

A potential exists for exploiting the State management of this stock in Federal waters under this alternative. Hypothetically, a vessel could refuse to comply with State regulations for the State dark rockfish fishery (e.g., a permit and compliance with directed fishing according to State law) and then proceed to fish the species in Federal waters if the vessel were not permitted by the State. In 2007, all catcher vessels and 123 catcher/processors with Federal Fishery Permits (FFP) to participate in the groundfish fisheries off Alaska also were permitted by the State.³ However, 21 catcher/processors with FFPs that participated in the groundfish fisheries off Alaska in 2007 were not permitted by the State. These 21 catcher/processors would not be subject to State regulations governing dark rockfish caught in Federal waters off Alaska. However, catcher/processors have not targeted dark rockfish and their incidental catch of dark rockfish is historically much lower (less than 1 percent) than the incidental catch limit the State is likely to establish. A similar situation occurred in the scallop fishery in 1995, when a Federal Scallop FMP did not exist (for more information see the 2006 Scallop SAFE report, NPFMC 2006). The fishery was eventually closed in State and Federal waters by emergency order and re-opened when a Federal FMP officially delegating authority to the State was approved. However, given the limited interest in the dark rockfish fishery, coupled with the predominance of the biomass of the nearshore species in State waters, it appears highly unlikely that such a situation would develop. Nevertheless, if a situation as described were to develop, emergency State and Federal measures would be immediately taken to protect the dark rockfish stock and ameliorate the situation.

4.2.2 Impacts on Other GOA Groundfish Stocks

Transfer to State management under alternative 2 is expected to have no impact on other Federally managed groundfish stocks. As discussed in Chapter 3 dark rockfish make up a very small percentage of the overall biomass and catch in the pelagic shelf rockfish complex. Dusky rockfish make up the majority of all catch (and the biomass of the complex). Impacts to the bycatch of species such as northern rockfish are expected to be the same under Alternative 2 as under the current status quo alternative.

State management of dark rockfish under this alternative would enhance reporting of dark rockfish in both the directed dark rockfish fishery as well as the black rockfish fishery. This would enhance data collection on dark rockfish and black rockfish stocks and improve catch accounting for both species.

4.2.3 Impacts on BSAI “Other Rockfish” Stocks

Alternative 2, transferring dark rockfish to State management by removing it from the Federal FMP, is anticipated to result in better management of the dark rockfish stock by managing it in conjunction with black rockfish. Black rockfish are a target fishery in the State in the Aleutian Islands region. If dark rockfish are removed from the “other rockfish” complex, the State will manage them as a single stock in State and Federal waters. The majority of the dark rockfish stock are presumed to be located in near-shore, shallow waters.

Dark rockfish are caught infrequently as incidental catch in other target fisheries in the BSAI. Under State management, dark rockfish would be assessed and managed as a single stock and the potential would exist to manage on smaller regions than the Federal management of the complex. There would be a minimal decrease in the overall annual ABCs (and TACs) for the “other rockfish” complex as a result of no longer including the fractional amount of biomass contributed by the dark rockfish stock.

In Federal fisheries, the retention of dark rockfish by State-permitted vessels would be controlled by the State MRAs. Since historic catches are approximately 1 percent or less of “other rockfish” catch in the

³ The numbers of vessels with FFPs to participate exceeds the number that actually participated and were used to deliver product.

EBS and 3% or less in the AI, it is unlikely that the MRA would compel substantial discarding or reduce catch. The MRA, however, would prevent targeting of dark rockfish. In other directed fisheries, discards of dark rockfish required by the MRA are likely to be minor, as catch of the species is relatively small relative to target catch. If a GHLL were established by the State then catch in Federal waters would be accounted for under the State GHLL.

It is likely that a small directed fishery and/or bycatch-only restrictions would be applied in the AI region. As with State management in the GOA, State management in the AI is on much smaller spatial scales than Federal management. Areas 541, 542 and 543 comprise the Federal AI management area (Figure 1). Here OFLs for the “other rockfish” complex are established BSAI-wide, while ABC and TAC are specified for the AI area. Spatial management by the State in the same AI area however would be on numerous, discrete regions as opposed to one large area, regardless of whether a directed fishery developed or bycatch restrictions were incorporated into the black rockfish fishery. As described in section 3.4.2, in the Akutan and Unalaska section of the AI registration area alone, there are 9 subsections for management purposes (Figure 24). This would allow for finer scale management measures to be applied for dark rockfish which given their patchy distribution, appears to be more appropriate than broad-scale management across the entire AI (Federal) management region.

Under this alternative the State would assume all management responsibilities for dark rockfish. This would entail assessment of the stock, management, and all recordkeeping and recording requirements. Both federal and State recordkeeping requirements would be adjusted to account for dark rockfish as a species separate from dusky rockfish. Catch information for dark rockfish will be improved by these changes in catch accounting. New reporting requirements will be necessary whether or not the Council chooses to move dark rockfish for State management. Additional reporting requirements and catch processing coding changes by the State of Alaska may also be necessary.

A potential exists for exploiting the State management of this stock in Federal waters under this alternative. Hypothetically, a vessel could refuse to comply with State regulations for the State dark rockfish fishery (e.g., a permit and compliance with directed fishing according to State law) and then proceed to fish the species in Federal waters if the vessel were not permitted by the State. In 2007, all catcher vessels and 123 catcher/processors with Federal Fishery Permits (FFP) to participate in the groundfish fisheries off Alaska also were permitted by the State.⁴ However, 21 catcher/processors with FFPs that participated in the groundfish fisheries off Alaska in 2007 were not permitted by the State. These 21 catcher/processors would not be subject to State regulations governing dark rockfish caught in Federal waters off Alaska. However, catcher/processors have not targeted dark rockfish and their incidental catch of dark rockfish is historically much lower (less than 1 percent) than the incidental catch limit the State is likely to establish. A similar situation occurred in the scallop fishery in 1995, when a Federal Scallop FMP did not exist (for more information see the 2006 Scallop SAFE report, NPFMC 2006). The fishery was eventually closed in State and Federal waters by emergency order and re-opened when a Federal FMP officially delegating authority to the State was approved. However, given the limited interest in the dark rockfish fishery, coupled with the predominance of the biomass of the nearshore species in State waters, it appears highly unlikely that such a situation would develop. Nevertheless, if a situation as described were to develop, emergency State and Federal measures would be immediately taken to protect the dark rockfish stock and ameliorate the situation.

⁴ The numbers of vessels with FFPs to participate exceeds the number that actually participated and were used to deliver product.

4.2.4 Impacts on Other BSAI Groundfish Stocks

Transferal to State management under alternative 2 is expected to have no impact on other Federally managed groundfish stocks. As discussed in Chapter 3 dark rockfish make up a very small percentage of the overall biomass and catch in the “other rockfish” complex. Shortspine thornyhead and dusky rockfish make up the majority of all catch (and the biomass of the complex).

State management of dark rockfish under this alternative would enhance reporting of dark rockfish in both the directed dark rockfish fishery as well as the black rockfish fishery. This would enhance data collection on dark rockfish and black rockfish stocks and improve catch accounting for both species.

4.3 Cumulative Impacts

This section describes the cumulative effects of the various alternatives. Cumulative effects of an alternative are the impacts on the environment resulting from the incremental effect of the alternative when added to other past, present or reasonably foreseeable future actions.

Direct and indirect effects of this action have been discussed in previous sections of this analysis. Additional actions considered here are ones which are reasonably foreseeable and may in conjunction with the proposed action have an additional impact.

One action of this nature is the Central GOA rockfish pilot program, a five-year management program approved by the Council under Amendment 68 to the GOA groundfish FMP. This program allocates rockfish species in the Central GOA management area in order to convey short-term economic stability to the region while comprehensive GOA groundfish rationalization initiatives are undertaken by the Council and NMFS. The pelagic shelf rockfish complex is among the species to be allocated under this program. A direct allocation of PSR will be specified. If dark rockfish are removed from that complex, it will have a separate MRA under State regulations. However, the incremental effect of implementing this program with dark rockfish excluded from the PSR allocation is expected to be minimal. The cumulative greatest effect will be realized by harvesters in the non-trawl sector who will benefit from a separate federal allocation of rockfish under the program (which will include primarily PSR and northern rockfish), while still having access to dark rockfish under State management. Since trawl vessels have little catch of dark rockfish, the cumulative effect of pilot program and the action to separate dark rockfish from the PSR complex will be minimal.

As with implementation of the rockfish pilot program, any incremental effect of implementing long-term comprehensive rationalization of the GOA groundfish fishery with dark rockfish removed from the PSR complex is likewise expected to be minimal. The specific effects of that possible action on any sector are not predictable, given the current hiatus in the development of that program.

5.0 REGULATORY IMPACT REVIEW

5.1 Introduction

This Regulatory Impact Review (RIR) examines the costs and benefits of proposed amendments to remove dark rockfish from the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA groundfish FMP) and the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI groundfish FMP).

5.2 What is a Regulatory Impact Review?

The preparation of an RIR is required under Presidential Executive Order (E.O.) 12866 (58 *FR* 51735: October 4, 1993). The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following Statement from the E.O.:

In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and Benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nonetheless essential to consider. Further, in choosing among alternative regulatory approaches agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

E.O. 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be “significant.” A “significant regulatory action” is one that is likely to:

Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, local or tribal governments or communities;

- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in this Executive Order.

5.3 Statutory Authority

Under the Magnuson-Stevens Act, the United States has exclusive fishery management authority over all marine fishery resources found within the exclusive economic zone (EEZ). The management of these marine resources is vested in the Secretary of Commerce (Secretary) and in the Regional Fishery Management Councils. The groundfish fisheries in the EEZ off Alaska are managed under the GOA groundfish FMP and the BSAI groundfish FMP.

5.4 Purpose and Need for Action

Dark rockfish are managed as part of the pelagic shelf rockfish (PSR) complex in the GOA groundfish FMP. Members of this complex include the following four species: dusky rockfish (*Sebastes variabilis*), dark rockfish (*S. ciliatus*), yellowtail rockfish (*S. flavidus*), and widow rockfish (*S. entomelas*). In the BSAI groundfish FMP, dark rockfish are managed as part of the “other rockfish” complex which contains

the following eight species: red banded rockfish (*Sebastes babcocki*), dark rockfish, dusky rockfish, redstripe rockfish (*S. proriger*), yelloweye rockfish (*S. ruberrimus*), harlequin rockfish (*S. variegates*), sharpchin rockfish (*S. zacentrus*), shortspine thornyhead (*Sebatolobus alascanus*).

The forms of dusky rockfish, formerly recognized as “light dusky rockfish” and “dark dusky rockfish”, are now officially recognized as two species (Orr and Blackburn 2004). *S. ciliatus* applies to the dark shallow-water species with a common name dark rockfish, and *S. variabilis* applies to variably colored deeper-water species with a common name dusky rockfish.

Dark rockfish are found predominantly in nearshore, shallow waters. Stock assessment authors and the GOA Plan Team have suggested, in recent years, that management of dark rockfish in the GOA be turned over to the State of Alaska as data in the stock assessment for PSR are predominantly from dusky rockfish (the offshore variety), not dark rockfish (the nearshore, shallow water variety). In the GOA most of the available information is from the offshore trawl surveys and offshore commercial fishery, where dusky rockfish makes up the majority of the exploitable biomass and catch from the complex. A similar concern has been raised by the BSAI Plan Team for dark rockfish in the “other rockfish” complex, where dusky rockfish and shortspine thornyheads make up the majority of exploitable biomass and catch from the complex.

5.4.1 OMB Market Failure Analysis

OMB guidelines for preparation of an economic analysis under E.O. 12866 state, in relevant part, that, “... in order to establish the need for the proposed action, the analysis should discuss whether the problem constitutes a significant market failure. If the problem does not constitute a market failure, the analysis should provide an alternative demonstration of compelling public need, such as improving governmental processes or addressing distributional concerns. If the proposed action is a result of a statutory or judicial directive, that should be so stated.”

This action is not taken because of a market failure; the resource is already under management by the Federal government. This action would end management by the Federal government and provide an opportunity for the State of Alaska to exercise its management authority, if it should choose to do so. This action is being taken, because, in this instance, the State of Alaska appears to be better positioned to provide comprehensive management of this largely nearshore (i.e., State-waters) species. This action would thereby contribute to improved governmental processes.

5.5 Alternatives Considered

Two alternatives are analyzed in this document: Alternative 1 (No Action), continue managing dark rockfish within the larger pelagic shelf rockfish complex in the GOA, and within the “other rockfish” complex in the BSAI; and Alternative 2, remove dark rockfish from the GOA groundfish FMP and BSAI groundfish FMP and turn management of this species in both State and Federal waters over to the State of Alaska.

5.5.1 Alternative 1: Status quo

Under this alternative, dark rockfish would continue to be managed within the GOA pelagic shelf rockfish complex and the “other rockfish” complex in the BSAI. The Council and the NMFS would retain management authority for dark rockfish in the EEZ. Overfishing limits (OFLs), acceptable biological catch (ABC) limits, and total allowable catch (TAC) limits are established for these complexes, as a whole, and managed accordingly. In season, catch in the GOA is managed through monitoring directed

fishing, with the fishery closed when directed fishing is estimated to leave only the portion of the TAC necessary to support incidental catch in other directed fisheries. Once the directed fishery is closed, incidental catch is managed under the aggregate rockfish maximum retainable amount (MRA), which limits retention of most rockfish of the genera *Sebastes* and *Sebastolobus*⁵ to between zero and 15 percent of the weight of the retained catch of species open to directed fishing (see Table 10 to part 679).

In the BSAI, the OFL is established area-wide (combined for Bering Sea and Aleutian Island areas, Figure 1). ABC limits and TAC limits are established for the complex, as a whole, and managed by individual area. Here, the Aleutian Islands (AI) area includes areas 541, 542 and 543, while the Bering Sea (BS) area includes the remaining areas (530, 523, 521, 524, 514, 513, 517, 518, 509, 516, 512, 508, Figure 1). There is no directed fishing on the “other rockfish” complex. The TAC is established to meet incidental catch in other directed fisheries. Incidental catch is managed under the aggregate rockfish maximum retainable amount (MRA), which limits catch of most rockfish of the genera *Sebastes* and *Sebastolobus* to between zero and 15 percent of the weight of the retained catch of species open to directed fishing (see Table 11 to part 679).

5.5.2 Alternative 2: Remove dark rockfish from the GOA and BSAI Groundfish FMPs

Under section 303(a)(3)(A) of the Magnuson-Stevens Act, a State may regulate a fishing vessel outside the boundaries of the State if the vessel is registered under the laws of the State and there is no fishery management plan or other applicable Federal fishing regulations for the fishery in which the vessel is operating. Alternative 2 would remove dark rockfish from the GOA groundfish FMP and the BSAI groundfish FMP, which would allow the State to manage the catch of these species by state permitted vessels in both State and Federal waters off Alaska.

Vessels operating in Federal waters without State permits could not be regulated by the State. These vessels might take dark rockfish as incidental catch, however the primary biomass of this species is believed to be close inshore, and dark rockfish incidental catch in Federal waters is expected to be small. NMFS would continue to produce estimates of dark rockfish harvest based on its observers, and this information would continue to be available to the State.

OFLs, ABCs and TACs would continue to be specified for the GOA PSR and BSAI “other rockfish” complexes, but these would no longer include dark rockfish. The State would take on the responsibility for assessment and management of the dark rockfish stock.

In managing dark rockfish, the State of Alaska could develop a fishery management plan for the species, under which, gear type, season, and guideline harvest levels (GHL) for the species would be specified. These management plans would be prepared by the Alaska Department of Fish and Game and reviewed by the Alaska Board of Fisheries. State management would include regulation of any directed fishing for dark rockfish. Dark rockfish bycatch by State-permitted vessels participating in either the State or Federal fisheries would be limited by a separate incidental catch limit, as established by the State. More information regarding the spatial scales of management regions for the State in the AI area are contained under section 3.4.2.

While specific management plans have not yet been formulated by the State, it is likely that measures used currently (e.g., in management of black rockfish) would be among those considered for dark rockfish management (D. Carlile, pers. comm.).

⁵ The aggregated rockfish category includes all rockfish of the genera *Sebastes* and *Sebastolobus* except black and blue rockfish in the GOA; demersal shelf rockfish in the Southeast Outside District of the GOA; and shorttraker and roughey rockfish in the Eastern Regulatory Area of the GOA.

These candidate measures would include, but not necessarily be limited to the following:

- Guideline harvest limits (GHLs, or quotas)
- Gear-, area-, and directed-fishery-specific incidental catch limits, wherein catch in excess of incidental catch limits would be reported as incidental catch overage on an ADF&G fish ticket, the excess incidental catch would be required to be landed, with all proceeds from the sale of excess dark rockfish incidental catch surrendered to the State.
- Full retention of all rockfish caught
- Directed fisheries for dark rockfish in some areas of the State; in others perhaps incidental catch only.
- No-take zones, wherein dark rockfish might not be allowed to be taken in a directed fishery.
- Gear restrictions (e.g. jig only) for directed fisheries.
- Trip limits.
- Reporting requirements, such as submission of ADF&G fish tickets and/or logbooks.
- Vessel registrations for specific directed dark rockfish fishery areas.

Management measures would likely vary by the State’s regions (Figure 27). For all regions, the primary potential improvement for the management of the species would arise from the State’s ability to regulate fisheries (e.g., openings and closings, area closures, etc., through the release of Emergency Orders) on much shorter notice, over smaller geographic areas, and with less supporting data than is readily implemented under Federal management. Further description of management by region (and smaller districts within each region, shown in Figure 27) is contained in section 3.1.4.

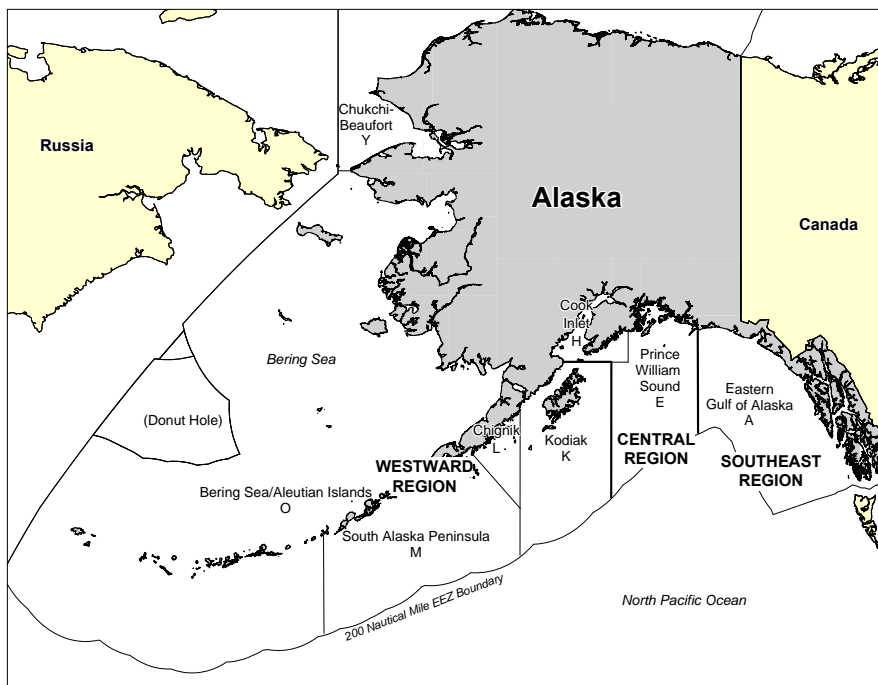


Figure 27 Alaska Department of Fish and Game groundfish registration areas and regions.

In Southeast, dark rockfish would likely be managed as part of a complex that includes black rockfish and blue rockfish, for which there is a directed fishery. In the Central Region, dark rockfish would be managed as part of the fisheries (directed in the Cook Inlet Area; incidental catch-only in the Prince

William Sound Area) for a complex of pelagic shelf rockfish that also includes dusky, widow, yellowtail, black, and blue rockfishes. The PWS Rockfish Management Plan requires full retention of all rockfish caught; proceeds of the sale of any incidental catch overage are surrendered to the State of Alaska. In the Westward Region, dark rockfish would probably be managed as a part of the directed black rockfish fishery.

5.6 Background

Data for the dusky rockfish landings, by all gear types, from 2003 through 2005 (which includes both dusky rockfish and dark rockfish) indicates that catcher vessels harvest a significant higher proportion of the total catch in this fishery, than do catcher/processors (Table 43). Unfortunately, the same level of species-specific data for the BSAI is not available at this time. In order to provide some indication of the fishery, aggregated rockfish data was included (Table 44 and Table 45). These data indicate catcher/processors, using trawl gear, are the primary participants in the BSAI rockfish fishery. “Other rockfish” are not a target fishery and are, instead, caught incidentally in other directed fisheries, notably in the longline fisheries for Pacific cod (where dusky rockfish is retained); in the Atka mackerel trawl fishery (retaining dusky rockfish); in the longline fisheries for sablefish, turbot, and halibut (retaining thornyheads); and in the rockfish trawl fishery (retaining thornyhead rockfish).

Table 43 Number of vessels and retained catch of pelagic shelf rockfish by vessel category in the GOA

Year	Vessel category	Number of Vessels	Retained Catch (mt)
2003	Catcher/processor	17	926
	Catcher Vessel	148	1,466
2004	Catcher/processor	19	985
	Catcher Vessel	134	1,381
2005*	Catcher/processor	14	777
	Catcher Vessel	114	1,104

Source: NPFMC, 2005; * from 2005 fish ticket data and Weekly Production Reports

Table 44 Number of vessels by gear that targeted rock fish by vessel category in the BSAI

Year	Vessel category	Trawl	Hook and Line
2003	Catcher/processor	11	2
	Catcher Vessel	1	4
2004	Catcher/processor	10	2
	Catcher Vessel	1	1
2005	Catcher/processor	6	3
	Catcher Vessel	0	1

Source: Hiatt et al. 2006

Table 45 Total targeted catch of rockfish by gear by vessel category in the BSAI (1,000 metric tons, round weight)

Year	Vessel category	Trawl	Hook and Line
2003	Catcher/processor	20	0
	Catcher Vessel	0	0
2004	Catcher/processor	17	0
	Catcher Vessel	0	0
2005	Catcher/processor	14	0
	Catcher Vessel	1	0

Source: Hiatt et al. 2006

A further look at participation by year, gear, and management area gives some indication of the relative participation for each gear type in the overall pelagic shelf rockfish fishery (Table 46).

Table 46 Number of vessels operating by NMFS management area and gear types for pelagic rockfish (primarily dusky, dark, yellowtail, and widow rockfish)

Year/Sum of # of vessels	Gear	Area						
		610	620	630	640	649	650	659
1998	Jig		2	11	2	1	11	1
	Fixed	15	18	70	20	12	33	30
	Trawl	26	37	53	16			
<i>1998 Total</i>		<i>41</i>	<i>57</i>	<i>134</i>	<i>38</i>	<i>13</i>	<i>44</i>	<i>31</i>
1999	Jig			10		2	13	1
	Fixed	27	27	60	19	16	33	38
	Trawl	22	39	52	20			
<i>1999 Total</i>		<i>49</i>	<i>66</i>	<i>122</i>	<i>39</i>	<i>18</i>	<i>46</i>	<i>39</i>
2000	Jig		6	12		2	13	5
	Fixed	25	30	79	24	13	39	39
	Trawl	27	26	39	9	2		
<i>2000 Total</i>		<i>52</i>	<i>62</i>	<i>130</i>	<i>33</i>	<i>17</i>	<i>52</i>	<i>44</i>
2001	Jig		4	13			12	5
	Fixed	29	21	55	11	6	36	26
	Trawl	27	27	38	11			
<i>2001 Total</i>		<i>56</i>	<i>52</i>	<i>106</i>	<i>22</i>	<i>6</i>	<i>48</i>	<i>31</i>
2002	Jig	2	6	18	3		11	9
	Fixed	22	14	37	7		28	21
	Trawl	20	19	33	4			
<i>2002 Total</i>		<i>44</i>	<i>39</i>	<i>88</i>	<i>14</i>		<i>39</i>	<i>30</i>
2003	Jig			10	0		57	3
	Fixed	0	0	3			35	8
	Trawl	9	3	37	0			
<i>2003 Total</i>		<i>9</i>	<i>3</i>	<i>50</i>	<i>0</i>		<i>92</i>	<i>11</i>
2004	Jig		0	22			43	4
	Fixed			3	0		25	5
	Trawl	10	5	36	0			
<i>2004 Total</i>		<i>10</i>	<i>5</i>	<i>61</i>	<i>0</i>		<i>68</i>	<i>9</i>
2005	Jig	0	0	16			27	0
	Fixed			0			10	7
	Trawl	8	6	33	0			
<i>2005 Total</i>		<i>8</i>	<i>6</i>	<i>49</i>	<i>0</i>		<i>37</i>	<i>7</i>

Source: NMFS Catch Accounting (preliminary data)

Fishermen have generally not fully harvested the available PSR TACs in past years. Table 47 shows TACs by GOA region, and compares them to actual catches, for the period from 2003 through 2007.

Table 47 GOA Pelagic Shelf Rockfish TACs and Catches by District and Year, 2003-2008. Measured in metric tons.

TAC						
	Western	Central	Eastern	WYAK	SEOut	Total
2003	510	3,480	1,500	640	860	5,490
2004	370	3,010	1,090	210	880	4,470
2005	377	3,067	1,109	211	898	4,553
2006	1,438	3,262	736	301	435	5,436
2007	1,466	3,325	751	307	444	5,542
2008	1,003	3,626	598	251	347	5,227
Catch						
	Western	Central	Eastern	WYAK	SEOut	Total
2003	164	2,194	617	607	10	2,975
2004	281	2,182	211	199	12	2,885
2005	118	1,843	218	215	3	2,397
2006	557	1,713	174	173	1	2,444
2007	589	2,395	294	293	1	3,278
2008						
Uncaught						
	Western	Central	Eastern	WYAK	SEOut	Total
2003	346	1,286	883	33	850	2,515
2004	89	828	879	11	868	1,585
2005	259	1,224	891	-4	895	2,156
2006	881	1,549	562	128	434	2,992
2007	877	930	457	14	443	2,264
2008						
Percent uncaught						
	Western	Central	Eastern	WYAK	SEOut	Total
2003	68%	37%	59%	5%	99%	46%
2004	24%	28%	81%	5%	99%	35%
2005	69%	40%	80%	-2%	100%	47%
2006	61%	47%	76%	43%	100%	55%
2007	60%	28%	61%	5%	100%	41%
2008						

In 2007, the Central GOA Rockfish Pilot Project became effective in the Central District.⁶ The pilot program divides the direct fishery TAC of target rockfish species between the main program, which received 95 percent of the TAC, and an entry level fishery, which receives 5 percent of the TAC, as mandated by the pilot program legislation.

The allocation to the primary pilot program is divided between the catcher vessel sector and the catcher/processor sector, based on historic catches of the participants in these respective sectors. In addition, each sector is allocated the important incidental catch species (i.e., sablefish, Pacific cod, and shorttraker and roughey rockfish and shortspine thornyheads) based on the historic harvests of the sector. Two exceptions are that Pacific cod is not allocated to catcher/processor cooperatives, and shorttraker and roughey rockfish are not allocated to catcher vessel cooperatives, but are instead managed under MRAs. These species are not allocated in the different cases, because the sector has limited catch of the species, which could lead to allocations inadequate to support catch of the primary rockfish species. But, MRAs are set low, relative to their historic levels, to discourage harvests in excess of historic catch amounts.

⁶ The description that follows was adapted with minimal changes from Fina and Heltzel.

Each sector is also allocated Pacific halibut PSC, based on historic catch of Pacific halibut in the target rockfish fisheries.

Under the program, participants in each sector can either fish as part of a cooperative or in a competitive, limited access fishery. Each cooperative receives allocations of target rockfish, secondary species, and Pacific halibut PSC from the sector's allocation, based on the target rockfish catch histories of its members. The limited access fishery receives an allocation of target rockfish, based on the target rockfish catch histories of sector members that choose not to join a cooperative. Secondary species catch is limited by an MRA, which is reduced from the historic level to maintain total catch at a level comparable to a corresponding cooperative allocation and to reduce the incentive to fish in the limited access fishery.

Cooperatives manage and coordinate fishing of their allocations. Target rockfish and secondary species are subject to a full retention requirement to minimize discards. All allocations to a cooperative are constraining, so a cooperative must manage and monitor its members' catch of target rockfish, allocated secondary species, and Pacific halibut PSC, to ensure that it is able to fully harvest (but not overharvest) its allocations. To protect processors, each catcher vessel in the program is eligible for a single cooperative, which must form an association with the processor to which it delivered the most rockfish historically. These cooperative/processor associations are intended to ensure that a cooperative lands a substantial portion of its catch with its members' historic processor. The exact terms of the association are subject to negotiation and are confidential to the parties, but since the cooperative agreement requires the approval of the associated processor, it is likely that these agreements contain terms defining cooperative landings requirements.

The fishing season for cooperatives under the pilot program is extended substantially. Where the trawl season once opened in early July and was closed as TAC or PSC limits were reached, it now opens May 1 and closes on November 15. Separate catcher vessel sector and catcher/processor sector limited access fisheries open for all target rockfish species on July 1 and close for each target rockfish species when the respective sector's participants are estimated to have fully harvested the allocation of the species.

Fina and Heltzel provide a detailed review of the first year's operations of the program (Fina and Heltzel, NPFMC, 2008).

5.7 Analysis of the Alternatives

5.7.1 Alternative 1: Status quo

Under the No Action alternative, dark rockfish will be managed under Federal regulation, as a part of the pelagic shelf rockfish complex (GOA), and the "other rockfish" complex (BSAI). Continued management as part of each complex is expected to maintain status quo conditions for the resource. This alternative is used as the baseline for determination of the costs and benefits of the action alternative, and further discussion is deferred to the discussion of Alternative 2.

5.7.2 Alternative 2: Remove dark rockfish from the GOA and BSAI Groundfish FMPs

Alternative 2 will affect dark rockfish and pelagic rockfish species in the GOA, and dark rockfish and the "other rockfish species" in the BSAI. The GOA and BSAI are dealt with separately below.

5.7.2.1 GOA

The action alternative has five major cost and benefit impacts in the GOA: (a) removal of dark rockfish from the PSR complex and the FMP should lead to better management of the dark rockfish resource; (b)

removal from the PSR complex will reduce the ABC and TAC available to the directed fishery in the Southeast Outside and Western regions and creates a minimal possibility of a loss of those fisheries; (c) removal will reduce the ABCs and TACs available to the directed fishery (and the Rockfish Pilot Project) in the Central and West Yakutat districts, and will create a greater possibility of loss for those fisheries; (d) removal will affect PSR incidental catch management; (e) State assumption of the management of dark rockfish may lead to the development of an inshore small vessel fishery, perhaps using jig gear, for dark rockfish.

(a) Benefits from State management

Removing dark rockfish from the Federal FMPs, and developing State management, would likely convey additional overfishing protection for this species, and would allow more conservative and, potentially, area specific management. The management impacts on dark rockfish are discussed in detail in the EA in sections 4.2.1 (“Impacts on GOA Pelagic Shelf Rockfish Stocks”), and 4.2.3 (“Impacts on BSAI ‘Other Rockfish’ Stocks”).

(b) No loss in targeted fisheries in Southeast Outside and Western Regions

Dark rockfish have been harvested as a part of the GOA pelagic shelf rockfish complex. Since 2004, they have been evaluated as a Tier 5 species. This means that the dark rockfish component of the PSR ABC has been determined by multiplying an estimate of biomass by a fishing mortality rate equal to 75% of the dark rockfish natural mortality rate ($F = .75 * .07 = .0525$). The dark rockfish ABC is then added to the ABCs calculated for other species in the complex to determine the overall complex ABC. TAC is normally set equal to ABC. Since dark rockfish incidental catch is believed to be very small in Federal waters of the GOA, most of the TAC created, based on the estimated dark rockfish biomass, is probably taken as other species, especially dusky rockfish.

The removal of dark rockfish from the PSR complex means that the overall PSR ABC and TAC will be reduced.⁷ Based on the 2007 SAFE report, the TAC for PSR in the GOA would be reduced by 450 mt (mostly from the Central GOA), although the actual amount will vary from year to year depending on the biomass estimate.⁸ However, this fishery has not harvested its full TAC in many years. Shortfalls in all years since 2000, have been over 1,500 mt, and the average shortfall was about 2,400 mt.

The ABC for PSR is divided regionally in the GOA on the basis of the distribution of PSR biomass, as determined from trawl surveys. In 2008, for example, the PSR ABC was divided so that 20% was assigned to the Western area of the GOA, 11% to the Eastern area, and 69% to the Central area.

As shown in Table 40, over the period 2003 through 2007, the likely dark rockfish portion of the TAC in the Western and Southeast Outside areas of the GOA fell well below the unfished portions of the PSR TACs in those regions. In the Western Region, only an average of 53% of the TACs were harvested in this period; in the Southeast Outside almost none of the TACs were harvested during this period.

Since landings in the Eastern and Western areas have fallen significantly short of the available TACs in recent years, it appears unlikely that the expected reductions in TACs will affect these fisheries. Entities

⁷ This may also lead to some minor shifts in the regional allocation of the ABC on the basis of survey biomass estimates as dark rockfish are no longer included in the aggregate biomass. This effect is abstracted from in the following analysis.

⁸ The 2007 biomass of dark rockfish may be higher because of a very high survey biomass estimate in the Shumagins in the 2005 trawl survey. As noted in the EA at Section 3.1.2.1, this result is based on one haul that appears to be an outlier for several reasons.

operating in these areas are unlikely to suffer any noticeable adverse effects from this action. Although vessels would no longer be permitted to directed fish for dark rockfish (as a part of the pelagic shelf rockfish complex) in Federal waters, since dark rockfish make up a very small part of the pelagic shelf rockfish catch, it is unlikely that any vessels would be required to discard dark rockfish catch in that fishery because of the maximum retainable amount.

While PSR harvests have also fallen below TAC levels in the Central GOA in recent years, management changes associated with the introduction of the Central GOA Rockfish Pilot Project make it likely that shortfalls will get smaller and perhaps disappear in coming years. In West Yakutat, the TAC has normally been harvested. The impacts in the Central GOA and West Yakutat are discussed separately in the following sub-section.

(c) Potential losses to Central Gulf and West Yakutat Fishermen

PSR is one of the primary allocated species under the Central Gulf Rockfish Pilot Project. Ninety-five percent of the PSR TAC is allocated to the catcher vessel or catcher/processor cooperatives, or the catcher vessel and catcher/processor limited access fisheries. The changing incentives associated with cooperatives are likely to make it possible for cooperative members to more fully harvest the PSR TAC.⁹ Thus, the low levels of TAC harvest observed in the Central GOA in the past (estimated in Table 40), and expected to continue in the Southeastern Outside and Western districts, may not remain applicable in the Central GOA.

During the first year of the program the segments of the fishery involved in the Pilot Project received 95% of the TAC (5% was set aside for an entry level fishery). This was 3,325 mt in 2007. The cooperatives and limited access fisheries harvested 2,480 mt, or about 75% of the available allocations. The cooperatives harvested 80% of their allocations. This was the first year of the program, and the industry was still learning how to operate within the cooperative mechanism, and during an extended season (under the program the cooperative fishery opens May 1 - prior to the program it had always opened on July 1 – and closes on November 15; part of the problem in 2007, reportedly, is that the co-ops waited to fish part of their quota until October-November, and were unable to locate the fish that late). It is likely that increasing proportions of the Central GOA PSR TAC will be harvested in future years, as the industry becomes accustomed to its new ways of operating.

In recent years (2004 through 2008) the allocation of PSR to the Central GOA has ranged between 60% and 69% of the GOA ABC. The area allocation is made by applying a percentage reflecting biomass location from the trawl surveys to the aggregate biomass of all four species included in PSR. Thus, the reduction in the PSR ABC associated with this action would be between 60% and 69% of the overall dark rockfish component of the GOA PSR ABC. The application of year-specific district allocation factors to year-specific estimates of the dark rockfish contribution to ABC suggests a reduction in Central GOA TACs ranging from 34 metric tons in 2004-2005, to 311 metric tons in 2008.

The ex-vessel price for dusky rockfish is currently about \$0.25 per pound.¹⁰ This suggests that the potential loss of gross revenue in the Central GOA could range from \$19,000 at the lower end, up to \$171,000 at the upper end, assuming the Pilot Project fisheries would have fully harvested the Central GOA TAC. This gross revenue loss estimate (and other revenue estimates below) has a large confidence range about it and is offered mainly as evidence that under plausible assumptions this cost could be significant. In this instance, costs may turn out to be higher if the co-ops are able to market a higher value

⁹ For details on the Pilot Project, and for a report on its first year of operation, see Fina and Heltzel.

¹⁰ This price estimate is based on anecdotal information collected from Kodiak processors by NMFS staff during the Spring of 2008.

product for a higher price, or lower if co-ops are unable to fully harvest TACs, or dark rockfish biomass estimates are lower in the future (note that the biomass estimate behind this revenue estimate depends heavily on one large haul in the 2005 survey).

In the West Yakutat portion of the GOA, fishing operations have normally come close to harvesting the TAC. In the four year period 2003 through 2007, they harvested 95% of the TAC in two years, overharvested by 2% in one year, and fell well short of harvesting the full TAC in only one year. The PSR portions of the ABC in West Yakutat have ranged from two to 25 mt during this period. If moving dark rockfish from the FMP leads to reductions in West Yakutat ABC and catch in this range, the cost to industry would range between \$1,300 and \$13,700.

(d) Incidental Catch Impacts

Fishermen fishing under the FMP currently take dark rockfish as incidental catch. Fishermen in cooperatives and in the limited entry fisheries count dark rockfish against their allocations while the season is open. Outside the seasons, dark rockfish are counted against rockfish MRAs. In the Eastern and Western regions of the GOA, where the Pilot Project does not apply, dark rockfish are subject to full retention during the season, and are harvested subject to an MRA constraint outside of the season. The MRA constraint is a general rockfish constraint, covering a group of rockfish species, rather than a dark rockfish specific MRA. In general, dark rockfish incidental catch is probably a small component of incidental catch, given the likelihood that most dark rockfish biomass is inshore.

The removal of dark rockfish from the FMP is unlikely to affect fishermen taking dark rockfish as incidental catch very much, primarily because dark rockfish incidental catch is believed to be small in Federal waters. Fishermen without Alaska permits will not be regulated. Presumably they would no longer have to count dark rockfish incidental catch against their MRAs. In practice, given the small numbers of dark rockfish, they may not go to the trouble of sorting them out, and may continue to count them against their MRAs. Fishermen with Alaska permits will not initially be regulated in Federal waters, and the previous discussion may apply to them as well. If Alaska adopts a management plan for dark rockfish that incorporates MRA limits in Federal waters, MRAs for dark rockfish may become legally enforceable on State permitted vessels in State and Federal waters.

(e) Potential for State Inshore Fisheries Development

The removal of dark rockfish from the FMP will open the way for Alaska to assume management of vessels with State permits. It is possible that this will eventually lead to a commercial target fishery in State waters. This may not take place immediately, because Alaska would need to prepare a management plan before permitting a directed fishery and the information to support a plan may not be immediately available. On the other hand, it is possible that the State may adopt the Federal TAC as a conservative GHL target. The TAC may be considered conservative because it is based on biomass estimates, themselves based on Federal trawl surveys in Federal waters. However the bulk of the species biomass is believed to occur in waters under State jurisdiction. Federal survey information will remain available to the State. Thus, a GHL similar to the existing Federal ABC may be considered conservative. Nevertheless, it is unclear exactly what steps Alaska will take, or on what timeframe.

Most likely, such a fishery would be prosecuted with fixed gear or jig gear, which could increase the value of the catch, as rockfish harvested with these gears have typically brought higher ex vessel prices than trawl caught rockfish. Whether such a fishery would grow to the current level of dark rockfish removals in the trawl catch is uncertain. Current regulations allow fixed gear vessels to begin fishing for pelagic shelf rockfish (including dark rockfish) in January, with the fixed gear fishery typically closing in mid-July. Completion of the harvest of the TAC, by trawl vessels, begins in early July. Thus, an

opportunity exists for targeting dark rockfish with fixed gear, under current management. In any case, due to the relatively low abundance of dark rockfish, such a fishery is likely to be relatively small. In the past, processors have not distinguished between black and dark rockfish in ex-vessel pricing. This spring (2008) processors have been paying about \$0.55 a pound for black rockfish. Extrapolating this price to a potential inshore dark rockfish fishery, using the current ABC (450 mt) suggests that revenues could reach as high as \$546,000, *ceteris paribus*.¹¹ As noted for an earlier gross revenue estimate, this estimate has a large confidence range and is offered mainly as evidence that, under plausible assumptions, this could be a significant source of gross revenue.

State regulations also would govern the retention of dark rockfish when a directed fishery for dark rockfish was not open. The State manages incidental catch, with incidental catch limits that are similar in structure to the Federal MRA regulations. The retention of dark rockfish by State-permitted vessels, in either the EEZ or in State waters, would be limited to a specified percent of the retained catch of species open to directed fishing. In 2007, all catcher vessels with a Federal Fishing Permit (FFP) to participate in the groundfish fisheries off Alaska were also issued fishing permits under State of Alaska regulations. In 2007, 123 catcher/processors with FFPs, also obtained fishing permits from the State, while 23 catcher/processors with FFPs did not. These 23 catcher/processors that are not State-permitted vessels would not be subject to the State's incidental catch limitations. However, these catcher/processors do not, in the normal course of fishing operations, target dark rockfish, and their incidental catch of dark rockfish (less than 1 percent) is historically much lower than the incidental catch limit the State is likely to establish for those vessels that will be regulated under State management.

5.7.2.2 BSAI

In the BSAI, the considerations are similar, however the volumes of dark rockfish are smaller and there is no directed fishery. Removal from the FMP may facilitate better management, is unlikely to impose costs on the fishery in Federal waters, and may lead to development of an inshore fishery.

In the 2007-2008 specifications, the dark rockfish biomass was estimated to be 448 mt, all located in the AI. All the rockfish species were treated as Tier 5 species, so the ABC was equal to the product of the biomass and a fishing mortality rate equal to 75% of natural mortality ($F = .75 * .09 = .0675$). Thus, the dark rockfish ABC was 30 mt. This action leads to a reduction of 30 mt in the ABC. TAC is typically set equal to ABC. (NPFMC, 2007) The other rockfish complex is on incidental catch status, year round in the BSAI, and the other rockfish TAC has not been fully harvested in recent years.

As noted, management of this resource may be improved under State management for the same reasons as in the GOA. Impacts on vessels in the BSAI would be very small, if any. Removal of dark rockfish from the "other rockfish" complex in the BSAI is also unlikely to result in catch exceeding the aggregate rockfish MRA for this species. Because of the small amounts of dark rockfish under consideration, the State may be less likely to invest in the development of management to support an inshore vessel fishery; thus, the benefits from this source may be smaller than those in the GOA. However, because there appear to be small costs, if any, from this action, and there are potential management benefits, it appears likely that this action would have small net benefits in the BSAI.

¹¹ This price estimate is based on anecdotal information collected by NMFS AKR staff in conversations with processors based in Kodiak, during the spring of 2008. The co-ops are hoping to market higher quality fillets and get higher prices for their product. However, they were unable to do so in the first year of the program. If they can do this, the price used here may turn out to be a low one. Fina and Heltzel note that 2007 prices did not rise significantly, but also note their expectation that the co-ops should be able to produce a higher valued product than had been the case before the program.

5.8 Summary of the costs and benefits

The benefits and costs identified in the preceding section are summarized in Table 48.

Table 48 Benefits and Costs of Removing Dark Rockfish from the BSAI and GOA FMPs.

	Alternative 1	Alternative 2
Nature of the alternative	This is the status quo with respect to management of dark rockfish. Dark rockfish remains in the Pelagic shelf rockfish complex in the GOA and in the “other rockfish” complex in the BSAI.	Dark rockfish is removed from the BSAI and GOA FMPs, allowing the State to regulate the operations of State permitted vessels.
Benefits	Baseline from which benefits are measured	Improved management of dark rockfish in the GOA and BSAI; no significant adverse impact on persons taking dark rockfish as incidental catch, or targeting dark rockfish in the Western GOA or Southeast Outside; potential for development of inshore dark rockfish fishery.
Costs	Baseline from which costs are measured.	reduced TACs and revenues from PSR harvests in the Central GOA and in West Yakutat; No significant costs in the BSAI
Net benefits	Baseline from which net benefits are measured.	Net impacts cannot be determined quantitatively. Likely a small positive net benefit to the Nation.

6.0 INITIAL REGULATORY FLEXIBILITY ANALYSIS

6.1 Introduction

This Initial Regulatory Flexibility Analysis (IRFA) evaluates the potential impacts, on small entities, of a proposed amendment to remove dark rockfish from the GOA and BSAI groundfish FMPs.

This IRFA addresses the statutory requirements of the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 (5 U.S.C. 601-612).

6.2 The Purpose of an IRFA

The RFA, first enacted in 1980, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a Federal regulation. Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require that agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and on the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action.

On March 29, 1996, President Clinton signed the Small Business Regulatory Enforcement Fairness Act. Among other things, the new law amended the RFA to allow judicial review of an agency's compliance with the RFA. The 1996 amendments also updated the requirements for a final regulatory flexibility analysis, including a description of the steps an agency must take to minimize the significant economic impact on small entities. Finally, the 1996 amendments expanded the authority of the Chief Counsel for Advocacy of the Small Business Administration (SBA) to file *amicus* briefs in court proceedings involving an agency's violation of the RFA.

In determining the scope, or 'universe', of the entities to be considered in an IRFA, NMFS generally includes only those entities that can reasonably be expected to be directly regulated by the proposed action. If the effects of the rule fall primarily on a distinct segment, or portion thereof, of the industry (e.g., user group, gear type, geographic area), that segment would be considered the universe for the purpose of this analysis. NMFS interprets the intent of the RFA to address negative economic impacts, not beneficial impacts, and thus such a focus exists in analyses that are designed to address RFA compliance.

Data on cost structure, affiliation, and operational procedures and strategies in the fishing sectors subject to the proposed regulatory action are insufficient, at present, to permit preparation of a "factual basis" upon which to certify that the preferred alternative does not have the potential to result in "significant adverse impacts on a substantial number of small entities" (as those terms are defined under RFA).

6.3 What is required in an IRFA?

Under 5 U.S.C., Section 603(b) of the RFA, each IRFA is required to contain:

- A description of the reasons why action by the agency is being considered;
- A succinct statement of the objectives of, and the legal basis for, the proposed rule;
- A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply (including a profile of the industry divided into industry segments, if appropriate);
- A description of the projected reporting, record keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
- An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap or conflict with the proposed rule;
- A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the proposed action, consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives, such as:
 1. The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
 2. The clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;
 3. The use of performance rather than design standards;
 4. An exemption from coverage of the rule, or any part thereof, for such small entities.

6.4 What is a small entity?

The RFA recognizes and defines three kinds of small entities: (1) small businesses, (2) small non-profit organizations, and (3) small government jurisdictions.

Small business. Section 601(3) of the RFA defines a ‘small business’ as having the same meaning as ‘small business concern’, which is defined under Section 3 of the Small Business Act. ‘Small business’ or ‘small business concern’ includes any firm that is independently owned and operated and not dominant in its field of operation. The SBA has further defined a “small business concern” as one “organized for profit, with a place of business located in the United States, and which operates primarily within the United States or which makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials or labor... A small business concern may be in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the firm is a joint venture there can be no more than 49 percent participation by foreign business entities in the joint venture.”

The SBA has established size criteria for all major industry sectors in the United States, including fish harvesting and fish processing businesses. A business involved in fish harvesting is a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates) and if it has combined annual receipts not in excess of \$4.0 million for all its affiliated operations worldwide. A seafood processor is a small business if it is independently owned and operated, not dominant in its field of operation, and employs 500 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. A business involved in both the harvesting and

processing of seafood products is a small business if it meets the \$4.0 million criterion for fish harvesting operations. Finally, a wholesale business servicing the fishing industry is a small business if it employs 100 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide.

The SBA has established “principles of affiliation” to determine whether a business concern is “independently owned and operated.” In general, business concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party controls or has the power to control both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern’s size. However, business concerns owned and controlled by Indian Tribes, Alaska Regional or Village Corporations organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601), Native Hawaiian Organizations, or Community Development Corporations authorized by 42 U.S.C. 9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

Affiliation may be based on stock ownership when, (1) a person is an affiliate of a concern if the person owns or controls, or has the power to control 50 percent or more of its voting stock, or a block of stock which affords control because it is large compared to other outstanding blocks of stock, or (2) if two or more persons each owns, controls or has the power to control less than 50 percent of the voting stock of a concern, with minority holdings that are equal or approximately equal in size, but the aggregate of these minority holdings is large as compared with any other stock holding, each such person is presumed to be an affiliate of the concern.

Affiliation may be based on common management or joint venture arrangements. Affiliation arises where one or more officers, directors, or general partners, controls the board of directors and/or the management of another concern. Parties to a joint venture also may be affiliates. A contractor and subcontractor are treated as joint venturers if the ostensible subcontractor will perform primary and vital requirements of a contract or if the prime contractor is unusually reliant upon the ostensible subcontractor. All requirements of the contract are considered in reviewing such relationship, including contract management, technical responsibilities, and the percentage of subcontracted work.

Small organizations. The RFA defines “small organizations” as any not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

Small governmental jurisdictions. The RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of fewer than 50,000.

6.5 Reason for considering the action

The reason for this action is described in more detail in Section 1.1 of the EA. The Council took this action to better protect and manage the small inshore stock of dark rockfish. This stock is currently managed within the pelagic shelf rockfish (PSR) complex, which is dominated by the biomass of the offshore dusky rockfish in the Gulf of Alaska (GOA), and in the “other rockfish” complex, which is

dominated by the biomass of thornyhead rockfish and dusky rockfish, in the Bering Sea and Aleutian Islands Area (BSAI).

Removing dark rockfish from the FMPs is necessary for the following reasons: (1) dark rockfish has recently been determined to be a separate species, (2) it has a distribution skewed to nearshore habitats not specifically assessed by the NMFS trawl surveys, (3) data in the stock assessments for PSR in the GOA and “other rockfish” in the BSAI are predominantly from dusky rockfish, not dark rockfish, thus potentially biasing dark rockfish biomass estimates, and (4) the risk of overfishing dark rockfish in local areas, given the relatively high TAC for the PSR and “other rockfish” complexes, as a whole.

Management by the State of Alaska would better address localized assessment and harvest requirements for this nearshore species than is currently provided by Federal management under the larger PSR complex in the GOA and the “other rockfish” complex in the BSAI. Dark rockfish are, in fact, in a similar situation to blue rockfish and black rockfish, which were removed from the GOA groundfish FMP by Amendment 46. As here, nearshore rockfish populations, which were not thought to be well-assessed by the trawl survey, were deleted from the GOA groundfish FMP, permitting management to be deferred to the State of Alaska (NPFMC 1998).

6.6 Objectives of, and legal basis for, the proposed action

Under the Magnuson-Stevens Act, the United States has exclusive fishery management authority over all marine fishery resources found within the exclusive economic zone (EEZ). The management of these marine resources is vested in the Secretary of Commerce (Secretary) and in the Regional Fishery Management Councils. The groundfish fisheries in the EEZ off Alaska are managed under the Fishery Management Plan (FMP) for Groundfish of the GOA. Statutory authority for measures designed to prevent overfishing is specifically addressed in Sec. 600.350 of the Magnuson-Stevens Act. That section establishes National Standard 1—Prevent Overfishing.

The objectives of this action are to remove dark rockfish from the BSAI and GOA groundfish FMPs to allow improved management by the State of Alaska, and to prevent overfishing of dark rockfish.

6.7 Number and description of small entities regulated by the proposed action

The numbers of small entities that may be directly regulated by this action have been estimated using information on gross revenues and AFA affiliation in 2006, and information on participation in the Rockfish Pilot Project and on corporate ownership of vessel fleets from 2007 and 2008.¹²

¹² Vessels participating in the Pilot Project in 2007 were assumed to be affiliated within the meaning of the RFA and have been treated as large vessels, since Pilot Project specific gross revenues exceeded \$4 million that year. Vessels with an AFA affiliation have been treated as large entities. Publicly available documents were examined to identify CP vessels affiliated through joint corporate ownership or management. When affiliated vessels grossed more than \$4 million, they have been treated as large entities. Unaffiliated catcher vessel and catcher/processor vessels have been treated as small entities if they grossed less than \$4 million in 2006. Catcher/processor revenues are first wholesale revenues; catcher vessel revenues are ex-vessel revenues. The Regulatory Flexibility Act requires consideration of gross revenues from all sources, including, but not limited to, other Federal fisheries, and fisheries within Alaska waters. The revenues reported in this analysis tend to understate actual total gross revenues for the entities evaluated, because of several data limitations: (a) they do not take account of fishing revenues from outside of Alaska (for example, West Coast whiting fisheries); (b) they do not take account of non-fishing gross revenues of the entity; (c) they may miss some types of affiliations among entities. For these reasons, this analysis may overestimate the number of small entities. The numbers of small vessels reported here are estimates, not counts, and have associated confidence intervals that cannot be assessed given available data.

In 2006, one year immediately preceding the Council action recommending the removal of dark rockfish from the FMPs, there were 81 small catcher vessels that made landings of pelagic shelf rockfish from the GOA, taken as either targeted or incidental catch fish. No small catcher-processors made such landings. The 81 small catcher vessels included 74 that used hook-and-line, pot, or jig gear, and seven that used pelagic or non-pelagic trawl gear. The 81 small catcher vessels averaged about \$400,000, in gross ex-vessel revenues from all sources.

In 2006, one small catcher/processor and 36 small catcher vessels made incidental catch landings of pelagic shelf rockfish in the BSAI. All together, 35 vessels used hook-and-line, pot, or jig gear, and two used trawl gear. The 37 small vessels averaged about \$1.4 million in gross revenues from all sources.

6.8 Recordkeeping and Reporting Requirements

No additional recordkeeping or reporting requirements are associated with removal of dark rockfish from the FMPs.

6.9 Federal rules that may duplicate, overlap, or conflict with proposed action

This analysis did not reveal any Federal rules that duplicate, overlap, or conflict with the proposed action.

6.10 Alternatives to the Proposed Action

The RFA requires that an IRFA contain a description of any significant alternatives to the proposed rule that accomplish the stated objectives of the proposed action, consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities.

Two alternatives are analyzed in this document: Alternative 1 – No Action, continue managing dark rockfish within the larger PSR complex in the GOA, and within the “other rockfish” complex in the BSAI; and Alternative 2 – Preferred Alternative, remove dark rockfish from the GOA groundfish FMP and BSAI groundfish FMP, and defer management of this species, in both State and Federal waters, to the State of Alaska. Detailed descriptions of each alternative analyzed (as well as, alternatives considered, but not advanced for analysis) in this EA/RIR/IRFA can be found in Section 2.0.

The preferred alternative may have adverse impacts on operations targeting pelagic shelf rockfish in the Central GOA and in the West Yakutat district. NMFS does not expect the action to have adverse impacts on operations targeting rockfish in the Southeast Outside and Western regions of the GOA, or in the BSAI (targeting does not appear to be significant in the Southeast Outside or BSAI). NMFS does not expect the action to have adverse impacts on operations taking dark rockfish as incidental catch. In the Central GOA, most of the adverse impact would fall on participants in the Central GOA Rockfish Pilot Project. Because of the affiliations these operations have through the quota management and allocation features of the pilot project, NMFS does not believe these operations can be considered small entities for the purpose of the RFA. However, it is possible that they would experience some adverse impact as described in the RIR. The primary alternative considered here, Alternative 1 – No Action, would not have these adverse impacts, but would not remove dark rockfish from the FMPs and, thus, does not accomplish the stated objective for the action.

The Council also considered an additional alternative to the proposed action that was not carried forward for analysis. This alternative was to transfer management authority of dark rockfish to the State of Alaska while retaining the species under the Federal FMPs. Demersal shelf rockfish in Southeast Alaska is under a similarly delegated management program with the State of Alaska. A similar alternative was considered

and rejected for black rockfish and blue rockfish under Amendment 46 to the GOA FMP. This alternative was not carried forward for dark rockfish because (1) State personnel would be required to comply with additional Federal management processes that may not be consistent with State procedures; (2) the State would need to meet both State and Federal requirements, which often prescribe different time-frames for management actions (e.g., notice, public meetings, and reports); and (3) the State did not believe it could meet the costly assessment requirements for managing a nearshore species, mandated under a Federal management plan.

7.0 CONSISTENCY WITH APPLICABLE LAW AND POLICY

7.1 Magnuson-Stevens Act

7.1.1 National Standards

The Council's over-arching mandate to guide it in the prevention of overfishing is National Standard 1. This national standard states that:

Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery.

This action is specifically being considered in order to limit the current potential for overfishing of the dark rockfish stock. Under the current pelagic shelf rockfish complex, the dark rockfish stock is vulnerable to overfishing given the relatively high complex-level TAC that could be taken on any member of the complex. Dark rockfish as discussed in the analysis makes up a small fraction of the biomass in the complex and is generally found in shallow, in-shore waters. Transferring management of dark rockfish to the State of Alaska is anticipated to be better responsive to protection of this stock.

7.1.2 Section 303(a)(9) – Fisheries Impact Statement

Section 303(a)(9) of the Magnuson-Stevens Act requires that any plan or amendment include a fishery impact statement which shall assess and describe the likely effects, if any, of the conservation and management measures on (a) participants in the fisheries and fishing communities affected by the plan or amendment; and (b) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants taking into account potential impacts on the participants in the fisheries, as well as participants in adjacent fisheries.

The alternative actions considered in this analysis are described in Chapter 2 of this document. The impacts of these actions on participants in the fisheries and fishing communities are evaluated in the Regulatory Impact Review, Chapter 5.

7.2 Marine Mammal Protection Act

The alternatives analyzed in this action are not likely to result in any significant impacts to marine mammals.

7.3 Coastal Zone Management Act

This action is consistent with the Coastal Zone Management Act.

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