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# St. Croix Draft Actions and Alternatives.



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# St. Croix-Draft Actions and Alternatives

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## **ACTION 1: Determine species to be included for management in the St. Croix Fishery Management Plan (FMP)**

**Alternative 1:** No action. The St. Croix FMP is composed of all species within the fishery management units (FMUs) historically managed under the Spiny Lobster FMP, Reef Fish FMP, Queen Conch FMP, and the Corals and Reef Associated Plants and Invertebrates FMP.

**Alternative 2:** Identify species to be managed in St. Croix EEZ waters using all or some of the criteria listed below.

For those species for which landings data are available, indicating the species is in the fishery, the Council will choose a set of criteria to determine if a species should be managed under the St. Croix FMP. The criteria under consideration include, (A) the status of the stock and/or the present existence of a harvest prohibition, (B) the degree to which the species occurs in state rather than federal waters and can therefore be affected by federal management, (C) the ecological importance of a species within the coral reef ecosystem, and (D) the extent of harvest relative to a pre-established threshold. The selected criteria will identify the species to be managed.

**Criterion A.** Include for management those species that are presently classified as overfished in U.S. Caribbean waters based on National Marine Fisheries Service (NMFS) determination, or for which historically identified harvest is now prohibited due to their ecological importance as habitat (corals presently included in the Corals and Reef Associated Plants and Invertebrates FMP) or habitat engineers (midnight, blue, rainbow parrotfish), or those species for which seasonal closures or size limits apply.

**Criterion B.** Exclude from federal management those species that have been determined to infrequently occur in federal waters based on expert analysis guided by available data.

**Criterion C.** Include for management those species that are biologically vulnerable, constrained to a specific habitat that renders them particularly vulnerable, or have an essential ecological value, as determined by expert analysis.

**Criterion D.** Include those species possessing economic importance to the nation or regional economy based on a threshold of landings or value separately determined for each of the recreational, commercial, and aquarium trade sectors as appropriate (e.g., top 90%) and those representing an important component of bycatch, as established by expert analysis.



**Alternative 3:** For those species for which landings data are available, indicating the species is in the fishery, the Council will follow a stepwise application of a set of criteria to determine if a species should be managed under the St. Croix FMP (Table 1.3.1). The criteria under consideration include, in order:

**Criterion A.** Include for management those species that are presently classified as overfished in U.S. Caribbean waters based on NMFS determination, or for which historically identified harvest is now prohibited due to their ecological importance as habitat (corals presently included in the Corals and Reef Associated Plants and Invertebrates FMP) or habitat engineers (midnight, blue, rainbow parrotfish), or those species for which seasonal closures or size limits apply;

**Criterion B.** *From the remainder*, exclude from federal management those species that have been determined to infrequently occur in federal waters based on expert analysis guided by available data;

**Criterion C.** *From the remainder*, include for management those species that are biologically vulnerable, constrained to a specific habitat that renders them particularly vulnerable, or have an essential ecological value, as determined by expert analysis;

**Criterion D.** *From the remainder*, include those species possessing economic importance to the nation or regional economy based on a threshold of landings or value separately determined for each of the recreational, commercial, and aquarium trade sectors as appropriate (e.g., top 90%) and those representing an important component of bycatch, as established by expert analysis.

Table 1.3.1. Draft list of species to be included in the St. Croix FMP based on Alternative 3.

	SPECIES COMMON NAME	SPECIES SCIENTIFIC NAME
1	CONCH, QUEEN	<i>Strombus gigas</i>
2	PARROTFISH, RAINBOW	<i>Scarus guacamaia</i>
3	STRIPED PARROTFISH	<i>Scarus croicensis</i>
4	PARROTFISH, BLUE	<i>Scarus coeruleus</i>
5	PARROTFISH, MIDNIGHT	<i>Scarus coelestinus</i>
6	PARROTFISH, STOPLIGHT	<i>Sparisoma viride</i>
7	PARROTFISH, REDFIN	<i>Sparisoma rubripinne</i>
8	PARROTFISH, REDTAIL	<i>Sparisoma chrysopterum</i>
9	PARROTFISH, REDBAND	<i>Sparisoma aurofrenatum</i>
10	PARROTFISH, QUEEN	<i>Scarus vetula</i>
11	PARROTFISH, PRINCESS	<i>Scarus taeniopterus</i>



12	SNAPPER, VERMILION	<i>Rhomboplites aurorubens</i>
13	SNAPPER, SILK	<i>Lutjanus vivanus</i>
14	SNAPPER, BLACKFIN	<i>Lutjanus buccanella</i>
15	SNAPPER, BLACK	<i>Apsilus dentatus</i>
16	SNAPPER, QUEEN	<i>Etelis oculatus</i>
17	SNAPPER, LANE	<i>Lutjanus synagris</i>
18	SNAPPER, GRAY	<i>Lutjanus griseus</i>
19	SCHOOLMASTER	<i>Lutjanus apodus</i>
20	SNAPPER, MUTTON	<i>Lutjanus analis</i>
21	SNAPPER, YELLOWTAIL	<i>Ocyurus chrysurus</i>
22	GROUPER, NASSAU	<i>Epinephelus striatus</i>
23	GOLIATH GROUPER	<i>Epinephelus itajara</i>
24	HIND, RED	<i>Epinephelus guttatus</i>
25	CONEY	<i>Epinephelus fulvus</i>
26	GRAYSBY	<i>Epinephelus cruentatus</i>
27	HIND, ROCK	<i>Epinephelus adscensionis</i>
28	GROUPER, BLACK	<i>Mycteroperca bonaci</i>
29	GROUPER, TIGER	<i>Mycteroperca tigris</i>
30	GROUPER, YELLOWFIN	<i>Mycteroperca venenosa</i>
31	GROUPER, RED	<i>Epinephelus morio</i>
32	GROUPER, MISTY	<i>Epinephelus mystacinus</i>
33	GROUPER, YELLOWEDGE	<i>Epinephelus flavolimbatus</i>
34	GRUNT, BLUESTRIPED	<i>Haemulon sciurus</i>
35	GRUNT, WHITE	<i>Haemulon plumieri</i>
36	SQUIRRELFISH, LONGSPINE	<i>Holocentrus rufus</i>
37	TANG, BLUE	<i>Acanthurus coeruleus</i>
38	DOCTORFISH	<i>Acanthurus chirurgus</i>



39	SURGEON, OCEAN	<i>Acanthurus bahianus</i>
40	TRIGGERFISH, QUEEN	<i>Balistes vetula</i>
41	ANGELFISH, FRENCH	<i>Pomacanthus paru</i>
42	ANGELFISH, GRAY	<i>Pomacanthus arcuatus</i>
43	ANGELFISH, QUEEN	<i>Holacanthus ciliaris</i>
44	LOBSTER, CARIBBEAN SPINY	<i>Panulirus argus</i>
45	DOLPHIN	<i>Coryphaena hippurus</i>
46	WAHOO	<i>Acanthocybium solandri</i>

## **ACTION 2: Establish stock complexes in the St. Croix Fishery Management Unit (FMU)**

**Alternative 1:** No Action. Organize stocks in the St. Croix FMU based on the stock complexes historically managed under the Reef Fish, Spiny Lobster, Queen Conch, and Coral and Reef Associated Plants and Invertebrates FMPs.

**Alternative 2:** Do not organize the stocks in the St. Croix FMU in stock complexes.

**Alternative 3:** Organize stocks in the St. Croix FMU into stock complexes based on criteria developed by the Council and their Scientific and Statistical Committee (SSC) in cooperation with NMFS' Southeast Fisheries Science Center and Southeast Regional Office.

**Discussion:** Action 2 provides the Council the option to organize the stocks in the St. Croix FMU into stock complexes. National Standard 1 defines a "stock complex" as a group of stocks that are sufficiently similar in geographic distribution, life history, and vulnerabilities to the fishery such that the impact of management actions on the stock is similar. **Alternative 1** is the no action alternative and would group the stocks in the St. Croix FMU based on the existing stock complexes historically managed under the Reef Fish, Spiny Lobster, Queen Conch, and Coral and Reef Associated Plants and Invertebrates FMPs (species-based FMPs). The existing stock complexes were established by the Council based on similar habitat by depth distribution patterns, landings history, and ecology of the species.

**Alternative 2** would not organize stocks into stock complexes but would instead consider all the stocks in the St. Croix FMU individually for management purposes (i.e., species). **Alternative 3** would allow the Council to reevaluate grouping criteria (e.g., fishing behavior, similarities in harvest gear) to group stocks into stock complexes for the St. Croix FMU.



## ACTION 3: Define management reference points for species within the St. Croix FMU

### Action 3 (a): Establish a year sequence for determining mean or median annual landings for each stock within the St. Croix FMU.

**Alternative 1:** No Action. Use the time series in the U.S. Caribbean 2010 or 2011 Comprehensive Annual Catch Limit (ACLs) Amendment to establish management reference points or proxies for stocks in the St. Croix FMU.

**Alternative 2:** Use the longest year sequence of reliable landings data to establish management reference points or proxies for stocks in the St. Croix FMU.

**Alternative 3.** Use the most recent three years of available landings data to establish management reference points or proxies for stocks in the St. Croix FMU.

Table 3.a.1. Year sequences under Action 3(a) Alternatives 1 through 3.

	<b>St. Croix Commercial</b>
Alternative 1	1999-2005 for species considered in the 2010 ACL Amendment and 1999-2008 for species considered in the 2011 ACL Amendment.
Alternative 2	1999-2014
Alternative 3	2012-2014

**Discussion: Alternative 1** is the no action alternative and would define management reference points or proxies for stocks in the St. Croix FMU based on the year sequence previously identified by the Council's SSC when determining the longest year sequence of reliable landings data during the development of the 2010 or the 2011 Comprehensive ACL Amendments. In the 2010 Comprehensive ACL Amendment, the Council's SSC determined that the years of 1999 through 2005 captured the longest time series of reliable landings data for overfished species (i.e., snappers, groupers, and parrotfishes) for the St. Croix commercial sector. In the 2011 Comprehensive ACL Amendment, the Council's SSC recommended a 2000-2008 year sequence as the longest time series of reliable landings data for all other managed species.

**Alternative 2** would include the a start year of 1999, which was used in the 2010 and 2011 Comprehensive ACL Amendments through the most recent year of reported landings for the commercial sector in St. Croix. The year 2014 is presently the most recent year for which the Southeast Fisheries Science Center has St. Croix commercial landings data.

**Alternative 3** would include the most recent three years of available landings data for the commercial sector in St. Croix. If considered, **Alternative 3** would also allow the Council to choose a year (i.e., July of 2011) when there was a key change in the commercial data reporting forms in the USVI including the St.



Croix commercial sector. The new reporting forms take a more species-based approach to reporting landings data.

The Council will use the year sequences selected in Action 3(a) to define the management reference points in Action 3(b) for the stocks in the St. Croix FMU.

### **Action 3 (b): Establish management reference points for stocks in the St. Croix FMU**

**Alternative 1:** No Action. For stocks in the St. Croix FMU, retain the management reference points or proxies presently used for species or species groups within the Reef Fish, Spiny Lobster, Queen Conch, and Coral and Reef Associated Plants and Invertebrates FMPs.

**Alternatives 2(a) through 2(m):** For stocks in the St. Croix FMU, establish management reference points or proxies based on the year sequence of landings data as defined in Action 3(a) and chosen in Table 3.b.1.

**Discussion:** The Magnuson-Stevens Fishery Conservation and Management Act (MSA) require that FMPs specify a number of reference points for managed fish stocks, including:

- Maximum Sustainable Yield (MSY) – The greatest amount or yield that can be sustainably harvested under prevailing environmental conditions.
- Overfishing Limit (OFL) – The maximum rate of fishing a stock can withstand (MFMT) or maximum yield a stock can produce (OFL) annually, while still providing MSY on a continuing basis.
- Acceptable Biological Catch (ABC) – A term used by a management agency, which refers to the range of acceptable catch for a species or species group.
- Optimum Yield (OY) – The amount or yield that provides the greatest overall benefit to the Nation, taking into account food production, recreational opportunities and the protection of marine ecosystems.
- Annual Catch Limit (ACL) – The level of annual catch of a stock or stock complex that serves as the basis for invoking accountability measures.

Together, these parameters are intended to provide the means to measure the status and performance of fisheries relative to the established FMP goals. Available data in the U.S. Caribbean are not sufficient to support direct estimation of MSY and other key parameters. In such cases, the National Standard 1 guidelines included in the MSA direct regional fishery management councils to adopt other measures of productive capacity, including long-term average catch, which can serve as reasonable proxies.

This section describes reference points or proxies for stocks/stock complexes comprising the St. Croix FMU, including alternative approaches for developing the MSY proxy, OFL, ABC, OY, and ACL for each stock or stock complex considered by the Council to ensure compliance with the mandates of the MSA. None of the parameter estimates considered here represents empirical estimates derived from a comprehensive stock assessment; rather, all are calculated based on landings data averaged over alternative time series.





Table 3.b.1. Options to establish management reference points for stocks in the St. Croix FMU.

<b>REFERENCE POINT</b>	
<b>Maximum Sustainable Yield</b>	
Alternative 2(a)	MSY proxy = Median annual landings selected by Council in Action 3(a).
Alternative 2(b)	MSY proxy = Mean annual landings selected by Council in Action 3(a).
<b>Overfishing Limit</b>	
Alternative 2(c)	OFL = MSY proxy adjusted using the ORCS scalar; overfishing occurs when annual landings exceed the OFL, unless NMFS' Southeast Fisheries Science Center (in consultation with the Caribbean Fishery Management Council and its SSC) determines the overage occurred because data collection/monitoring improved, rather than because landings actually increased.
Alternative 2(d)	OFL = MSY proxy; overfishing occurs when annual landings exceed the OFL, unless NMFS' Southeast Fisheries Science Center (in consultation with the Caribbean Fishery Management Council and its SSC) determines the overage occurred because data collection/monitoring improved, rather than because landings actually increased.
<b>Acceptable Biological Catch Control Rule</b>	
Alternative 2(e)	ABC= OFL
Alternative 2(f)	ABC= [OFL x 0.90]
Alternative 2(g)	ABC= [OFL x 0.85]
Alternative 2(h)	ABC= [OFL x 0.75]
<b>Optimum Yield/Annual Catch Limit</b>	
Alternative 2(i)	OY = ACL = ABC
Alternative 2(j)	OY = ACL = [ABC x (0.90)]
Alternative 2(k)	OY = ACL = [ABC x (0.85)]
Alternative 2(l)	OY = ACL = [ABC x (0.75)]
Alternative 2(m)	OY = ACL = 0

All the reference points considered in Action 3(b) are closely interrelated, and the MSA places several key constraints on what can be considered in a reasonable suite of alternatives. Optimum yield must be



less than or equal to MSY. The ACL must be less than or equal to the ABC level recommended by a Council's SSC or other established peer-review process, and the ABC recommendation must be less than or equal to the OFL.

In Action 3(b), **Alternative 1** is the no action alternative and would retain the present MSY proxy, OY, and overfishing limit definitions specified in the 2010 and 2011 Comprehensive ACL Amendments for the St. Croix stock/stock complexes established under the existing species-based FMPs.

**Alternatives 2(a) – 2(m)** would define management reference points or proxies based on a year sequence selected by the Council for the commercial sector in St. Croix in Action 3(a). Specific definitions are detailed in Table 3.b.1.

The MSY proxy specified by **Alternative 2(a)** would equate to the median of annual landings, calculated from commercial landings data for the year sequence as defined in Action 3(a). Under **Alternative 2(b)** the MSY proxy would equal the mean annual landings for the year sequence as defined in Action 3(a).

NOAA Technical Memorandum NMFS-SEFSC-616 (Berkson et al. 2011) describes a method (Only Reliable Catch Stocks (ORCS)) for setting OFL for data-poor species and then deriving an ABC level as a proportion of that OFL. This approach (**Alternative 2(c)**) could be applied for stocks in the St. Croix FMU. In brief, calculating an OFL using the ORCS methodology is based on two terms: a scalar (or multiplier) derived from the stock status expert opinion analysis (see Table 4 of Berkson et al. 2011), and a catch statistic derived from a time series of historical catches. **Alternative 2(d)** would establish an OFL equal to the MSY proxy.

After the OFL has been defined, the ABC needs to be established. The Council's SSC would make a recommendation to the Council on what the ABC control rule for managed stocks should be (**Alternatives 2(e) – 2(h)**). The Council will then determine the appropriate buffer (100-75 percent) to be applied to reduce from the OFL to the ABC, based upon scientific knowledge of the stock and uncertainty in the estimate of OFL. After establishing the ABCs, the Council would set the ACL values equal to some proportion (100-75 percent or zero) of the ABC to take into account uncertainty, ecological factors, and other concerns (**Alternatives 2(i) - 2(m)**).



## **ACTION 4: Modify or Establish Additional Management Measures as Needed.**

**Discussion:** Action 4 is a place holder that gives the opportunity to the Council to modify or establish any current or additional management measure at this stage of the development of the island-based fishery management plans.

### **References**

CFMC. 2011a. Amendment 2 to the Fishery Management Plan for the Queen Conch Fishery of Puerto Rico and the U.S. Virgin Islands and Amendment 5 to the Reef Fish Fishery Management Plan of Puerto Rico and the U.S. Virgin Islands. Caribbean Fishery Management Council, San Juan, Puerto Rico. 523 pp + Appendices.

CFMC. 2011b. Comprehensive annual catch limit amendment for the Fishery Management Plans of the U.S. Caribbean. Caribbean Fishery Management Council, San Juan, Puerto Rico. 407 pp.

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