

# EIS Action 1

## Determine the Species to be Included for Management in the *X Island* Fishery Management Plan (FMP)

**Alternative 1.** No action. The *X Island* FMP is composed of all species within the fishery management units presently managed under the Spiny Lobster, Reef Fish, Queen Conch, and the Corals and Reef Associated Plants and Invertebrates (Coral) FMPs.

**Alternative 2 (Preliminary Preferred).** For those species for which landings data are available, indicating the species is in the fishery, the Caribbean Fishery Management Council (Council) will follow a stepwise application of a set of criteria to determine if a species should be managed under the *X Island* FMP. The criteria under consideration include, in order:

# EIS Action 1 (Alt. 2 Cont.)

**Criterion A.** Include for management those species that are presently classified as **overfished** in U.S. Caribbean federal 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 species, 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 species, 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 species, 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.

**NEW!!! Criterion E.** For the species that would be selected for management as a result of applying Criteria A through D, exclude those the Council determines are not in need of conservation and management because the total (commercial + recreational) average landings during the reference period chosen in subsequent actions are less than 2000 pounds and are therefore considered to be *de minimus*.

# EIS Action 1 (Cont.)

**Alternative 3 (Preliminary Preferred).** 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 X Island FMP. The criteria under consideration include, in order:

**Criterion A.** Include for management those species that are presently classified as **overfished** in U.S. Caribbean federal 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 Coral 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.

# EIS Action 1 (Alt. 3 Cont.)

**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.

**NEW!!! Criterion E.** For the species that would be selected for management as a result of applying Criteria A through D, exclude those the Council determines are not in need of conservation and management because the total (commercial + recreational) average landings during the reference period chosen in subsequent actions are less than 2000 pounds and are therefore considered to be *de minimus*.

# EIS Action 2

## Establish Stocks or Stock Complexes in the *X Island* Fishery Management Plan (FMP)

**Alternative 1. No Action.** In the *X Island FMP*, retain the stocks/stock complexes presently used for management in the *X Island* EEZ under the Reef Fish, Spiny Lobster, Queen Conch, and Coral FMPs. For species that were not previously managed in federal waters, no stock/stock complexes are established.

**Alternative 2.** Do not organize the species in the *X Island* FMP in stock complexes. Species would be managed as individual stocks.

**Alternative 3.** Manage species in the *X Island* FMP as individual stocks or as stock complexes, based on scientific analysis, including one or more of the following: cluster analysis based on landings patterns; outcomes from the SEDAR Caribbean Data Evaluation Workshop (2009) (only for species previously managed that will remain in the FMP); biological/life history similarities and vulnerability (for all species); and, expert opinion from the scientific and fishing communities (for all species).

# EIS Action 2

**New!!!** Alternative 4. Where there are stock complexes, determine whether to assign one or more indicator stocks as follows:

**New!!!** Sub-Alternative 4a. Indicator species would be used. One or more indicators would be assigned to a complex based on the following criteria: percent of the catch, targeted, habitat co-occurrence, life history/vulnerability, catch co-occurrence, data, and market. Species in the stock complex would be subject to accountability measures as a group based on the indicator species annual catch limit.

**New!!!** Sub-Alternative 4b. No indicator species would be used. For stock complexes for which harvest is allowed, species in the complex would be subject to accountability measures as a group based on the aggregate annual catch limit.

# Puerto Rico

Stock/Complex	Common Name
SU1	Black snapper
	Blackfin snapper
	<b>Silk snapper (indicator)</b>
	Vermilion snapper
SU2	Wenchman
	Cardinal snapper
SU3	<b>Queen snapper (indicator)</b>
SU4	Lane snapper
	<b>Mutton snapper (indicator)</b>
	Dog snapper
SU5	Schoolmaster
SU6	Yellowtail snapper
GU1	Cubera snapper
GU2	Nassau Grouper
GU3	Goliath grouper
	Graysby
GU4	<b>Coney (indicator)</b>
	Black grouper
	Red grouper
	Tiger grouper
	Yellowfin grouper
GU5	Yellowmouth grouper
	Yellowedge grouper
GU6	Misty grouper
	<b>Red hind (indicator)</b>
	Rock hind

Stock/Complex	Common Name
Queen conch	Queen conch
Spiny Lobster	Caribbean spiny lobster
Parrotfish 1	Blue parrotfish
	Midnight parrotfish
	Rainbow parrotfish
Parrotfish 2	Queen parrotfish
	Princess parrotfish
	Redtail parrotfish
	Stoplight parrotfish
	Redband parrotfish
	Striped parrotfish
Surgeonfish	Blue tang
	Ocean surgeonfish
	Doctorfish
Angelfish	Queen angelfish
	Gray angelfish
	French angelfish
Triggerfish	Ocean triggerfish
	<b>Queen triggerfish (indicator)</b>
	Gray triggerfish
Wrasse 1	Hogfish
Wrasse 2	Puddingwife
	Spanish hogfish

Stock/Complex	Common Name
Barracuda	Great barracuda
Tripletail	Tripletail
Rays 1	Manta
Rays 2	Spotted eagle ray
Rays 3	Sting ray
Grunts	White grunt
Jacks 1	Crevalle jack
Jacks 2	African pompano
Jacks 3	Rainbow runner
Dorado	<b>Dolphin (indicator)</b>
Tunas	Pompano dolphin
	Little tunny
Mackerels	Blackfin tuna
	King mackerel
Wahoo	Cero
Cucumbers	Wahoo
Urchins	Sea cucumbers
Corals	Sea urchins
	Corals

# St. Thomas / St. John

Stock/Complex	Common Name
SU1	Black snapper
	<b>Blackfin snapper (indicator)</b>
	Silk snapper
	Vermilion snapper
SU2	Queen snapper
SU3	Lane snapper
	<b>Mutton snapper (indicator)</b>
SU4	Yellowtail snapper
GU1	Nassau Grouper
GU2	Goliath grouper
GU3	Coney
	<b>Red hind (indicator)</b>
GU4	Black grouper
	Red grouper
	Tiger grouper
	<b>Yellowfin grouper (indicator)</b>
GU5	Yellowmouth grouper
	Yellowedge grouper
	Misty grouper

Stock/Complex	Common Name
Queen conch	Queen conch
Spiny Lobster	Caribbean spiny lobster
Parrotfish 1	Blue parrotfish
	Midnight parrotfish
	Rainbow parrotfish
Parrotfish 2	Queen parrotfish
	Princess parrotfish
	<b>Redtail parrotfish (indicator)</b>
	<b>Stoplight parrotfish (indicator)</b>
	Redband parrotfish
	Striped parrotfish
	Redfin parrotfish
Grunts 1	<b>White grunt (indicator)</b>
	Bluestriped grunt
Grunts 2	Margate
Porgies	Jolthead porgy
	<b>Saucereye pluma (indicator)</b>
	Sheepshead porgy
	Sea bream

Stock/Complex	Common Name
Jacks 1	Blue runner
Surgeonfishes	Blue tang
	Ocean surgeonfish
Hogfish	<b>Doctorfish (indicator)</b>
	Hogfish
Angelfish	Queen angelfish
	<b>Gray angelfish (indicator)</b>
	French angelfish
Triggerfish	Queen triggerfish
Dolphin	Dolphin
Wahoo	Wahoo
Cucumbers	Sea cucumbers
Urchins	Sea urchins
Corals	Corals



# St. Croix

Stock/Complex	Common Name
SU1	Black snapper
	<b>Blackfin snapper (indicator)</b>
	<b>Silk snapper (indicator)</b>
	Vermilion snapper
SU2	Queen snapper
SU3	Gray snapper
	<b>Lane snapper (indicator)</b>
SU4	Mutton snapper
SU5	Schoolmaster
SU6	Yellowtail snapper
GU1	Nassau Grouper
GU2	Goliath grouper
GU3	<b>Coney (indicator)</b>
	Graysby
GU4	<b>Red hind (indicator)</b>
	Rock hind
GU5	Black grouper
	Red grouper
	Tiger grouper
	<b>Yellowfin grouper (indicator)</b>
GU6	Misty grouper
Grunts	Bluestriped grunt
	White grunt
Squirrelfish	Longspine squirrelfish

Stock/Complex	Common Name
Queen Conch	Queen conch
Spiny Lobster	Caribbean spiny lobster
Parrotfish 1	Blue parrotfish
	Midnight parrotfish
	Rainbow parrotfish
Parrotfish 2	Queen parrotfish
	Princess parrotfish
	<b>Redtail parrotfish (indicator)</b>
	<b>Stoplight parrotfish (indicator)</b>
	Redband parrotfish
	Redfin parrotfish
	Striped parrotfish
Surgeonfish	Blue tang
	Ocean surgeonfish
	Doctorfish
Angelfish	Queen angelfish
	Gray angelfish
	French angelfish
Triggerfish	Queen triggerfish
Dolphin	Dolphin
Wahoo	Wahoo
Cucumbers	Sea cucumbers
Urchins	Sea urchins
Corals	Corals

# EIS Action 3

## Management Reference Points for Stocks/Stock Complexes in the *X Island* FMP

**Alternative 1.** No action. For those stocks/stock complexes for which species-specific landings data is not available, retain the management reference point values (maximum sustainable yield (MSY), overfishing limit (OFL), acceptable biological catch (ABC), optimum yield (OY), annual catch limit (ACL)) specified in the 2010 and 2011 Caribbean ACL Amendments, as applicable.

**(NEW!!) Alternative 2.** When establishing management reference points for a stock/stock complex in the **Puerto Rico FMP**, specify by sector (i.e., commercial, recreational) when allowed by the data.

**Alternative 3.** Apply the stepwise process used in the 2010 Caribbean ACL Amendment and/or the 2011 Caribbean ACL Amendment, as applicable, to set management reference points for a stock/stock complex in the *X Island* FMP as described in the sub-alternatives on each of sections A-C below. Choose a sub-alternative from each section, in order (A-C), for each stock/stock complex.

*(continues on next slide)*

# EIS Action 3 *(Alt 3 Cont.)*

**A. Time Series** - select a time series of landings data to establish management reference points for a stock/stock complex, as applicable. A different sub-alternative can be chosen for each stock/stock complex.

**Sub-Alternative 3a.** Use the longest year sequence of reliable landings data available to set management reference points, as applicable.

**Sub-Alternative 3b.** Use the longest time series of pre-Caribbean Sustainable Fisheries Act (SFA) Amendment landings data that is considered to be consistently reliable to set management reference points.

**Sub-Alternative 3c.** Use 2012-2016 as the most recent five years of available landings data to set management reference points for a stock/stock complex.

**Sub-Alternative 3d.** Use another year sequence, as recommended by the Council's SSC, to set management reference points for a stock/stock complex.

**B. MSY Proxy** - Establish the MSY proxy as described by any of the sub-alternatives below. A different sub-alternative can be chosen for each stock/stock complex. The MSY proxy resulting from this alternative would be set equal to the OFL (MSY proxy = OFL). *(Note: process for each of the commercial and recreational sectors would need to be determined in this section)*

**Sub-Alternative 3e.** Median annual landings from year sequence selected in Alternative 3.A.

**Sub-Alternative 3f.** Mean annual landings for year sequence selected in Alternative 3.A.

**Sub-Alternative 3g.** For the recreational sector, use the maximum of a single year of recreational landings x 3.

**Sub-Alternative 3h.** For the recreational sector, use the mean recreational catch (i.e., landings and bycatch) from MRFSS/MRIP during year sequence in **Alternative 3A**.

# EIS Action 3 *(Alt 2 (Cont.))*

## C. Acceptable Biological Catch

**Sub-Alternative 3i.** Do not specify an ABC Control Rule. Adopt the ABC recommended by the Council's SSC. The SSC will develop the ABC on an ad hoc basis for each stock/stock complex.

**Sub-Alternative 3j.** Adopt an ABC Control Rule where  $ABC = OFL$

**Sub-Alternative 3k.** Adopt an ABC Control Rule where  $ABC = OFL \times 0.90$

**Sub-Alternative 3l.** Adopt an ABC Control Rule where  $ABC = OFL \times 0.85$

**Sub-Alternative 3m.** Adopt an ABC Control Rule where  $ABC = OFL \times 0.75$

**D. Optimum Yield and Annual Catch Limit** – Determine the OY and the ACL based on the formula in one of the sub-alternatives below and the ABC established in **Alternative 3.C.**

**Sub-Alternative 3n.**  $OY = ACL = ABC$

**Sub-Alternative 3o.**  $OY = ACL = ABC \times 0.90$

**Sub-Alternative 3p.**  $OY = ACL = ABC \times 0.85$

**Sub-Alternative 3q.**  $OY = ACL = ABC \times 0.75$

**Sub-Alternative 3r.**  $OY = ACL = 0$

# EIS Action 3

**Alternative 4.** A. For those stocks/stock complexes with valid assessments (Tiers 1-3) or those for which landings and/or ancillary information (Tier 4) are available, adopt the ABC Control Rule described on next slide. For stocks/stock complexes in Tiers 4A and 4B, the MSY proxy = OFL proxy; **the overfishing status determination criteria (OFL proxy) will be determined by the Southeast Fisheries Science Center (SEFSC); and**

B. Establish an ACL and OY by choosing any of the sub-alternatives in Section B below.

Tier 1 ABC CR (“Data Rich”)	
<b>Condition for Use</b>	<p>Full stage-structured assessment where reliable time series on (1) catch, (2) stage composition and (3) index of abundance are available and the assessment provides estimates of MSST, MFMT, and PDF of OFL</p> <p>Minimum Stock Size Threshold (MSST) = <math>0.75 * SSB_{MSY}</math> (or proxy)  Maximum Fishing Mortality Threshold (MFMT) = <math>F_{MSY}</math> (or proxy)  <math>MFMT = F_{MSY}</math>  MSY = Long-term Yield at MFMT; (Assuming the spawner-recruit relationship is well estimated, otherwise undefined.)</p>
<b>OFL<sup>1</sup></b>	Yield at MFMT
<b>ABC</b>	<p>ABC = x= OFL as reduced by scientific uncertainty<sup>†</sup> and risk of overfishing<sup>††</sup>. The reduction factor is applied to the PDF of OFL, where the PDF is determined from the assessment (where <math>\sigma &gt; \sigma_{min}^{+++}</math>)</p> $ABC^* = d(x) \quad \text{where } d = \begin{cases} \text{Scalar} & \text{if } B \geq B_{msy} \\ \text{Scalar} * (B - B_{critical}) / (B_{msy} - B_{critical}) & \text{if } B < B_{msy} \end{cases}$ <p><u>Where:</u>  Scalar is = 1 if risk of overfishing is specified (&lt;0.5), &lt;1 if not specified (=0.5)  <math>B_{critical}</math> is defined as the minimum level of depletion at which fishing would be allowed.  <sup>†</sup>Scientific uncertainty would take into account, but not be limited to, the species life history and ecological function.  <sup>††</sup>Risk of overfishing determined by Council  <sup>+++</sup><math>\sigma_{min}</math> could be equal to coefficient of variation; <math>\sigma_{min}</math> is in a log scale</p>
Tier 2 ABC CR (“Data Moderate”)	
<b>Condition for Use</b>	<p>Data-moderate approaches where two of the three time series (catch, stage composition and index of abundance) are deemed informative by the assessment process, and the assessment can provide MSST, MFMT, and PDF of OFL</p> <p>Same as Tier 1, but variation of the PDF of OFL (<math>\sigma</math>) must be greater than <math>1.5 \sigma_{min}</math> (in principle there should be more uncertainty with data-moderate approaches than data-rich approaches).</p>
Tier 3 ABC CR (“Data Limited Quantitative Assessments”)	
<b>Conditions for Use</b>	<p>Relatively data-limited or out-of-date assessments</p> <p><math>MFMT = F_{MSY}</math> (or proxy such as <math>F_{40\%}</math>)</p> <p><math>MSST = unknown</math></p>
<b>OFL</b>	OFL = catch at MFMT
<b>ABC</b>	<p>ABC determined from OFL as reduced by scientific uncertainty<sup>†</sup> and risk of overfishing<sup>††</sup></p> <p>a. Where the reduction factor is applied to the PDF of OFL when the PDF is determined from the assessment (with <math>\sigma \geq 2\sigma_{min}</math>)</p> <p><b>OR</b></p> <p>b. Where <math>ABC = reduction\ factor * OFL</math>, where <i>reduction factor</i> must be <math>\leq 0.9</math></p> <p><sup>†</sup>Scientific uncertainty would take into account, but not be limited to, the species life history and ecological function, the perceived level of depletion, and vulnerability of the</p>

# Control Rule Modifications

Change overfishing limit (OFL) to sustainable yield level (SYL).

Rationale: The SSC agreed by consensus to replace OFL with SYL

# Control Rule Modifications

## Sustainable Yield Level (SYL)

Maximum level of landings that can be sustained over the long term given the abundance of the stock at the time the limit was put in place. It is intended to be used when the information or resources needed to produce a quantitative stock assessment are not available to determine the MSY or corresponding reference point such as the OFL. As such, the SYL may be determined on the basis of historic landings patterns, Productivity Susceptibility Analyses, or other available information including expert opinion.



# Control Rule Modifications

## Sustainable Yield Level (SYL) - Rationale

- The SYL is an equilibrium (long-term) concept.
- This is in contrast to OFL, which is a non-equilibrium (short-term) quantity defined as the annual amount of catch that corresponds to the estimate of the MFMT applied to a stock's abundance.
- The value of OFL thus increases or decreases in accordance with the abundance of the stock, and MSY is the long-term average of such catches.
- The SYL is intended to ensure a stock is maintained at a sustainable level until the stock's status relative to MSY-related reference points can be determined.
- SYL is not intended as a metric for reporting stock status in terms of overfishing or overfished because it is not defined in those concepts.
- The landings level that is compared against the SYL is determined according to the monitoring protocol established by the Caribbean Council in the governing FMP.
- $MSY \geq SYL \geq ABC \geq ACL$

# Control Rule Modifications

For Tier 4a modify to: scalar  $\leq 3$  depending on perceived degree of exploitation, life history and ecological function.

Rationale: In some instances the calculated scalar was greater than 2. See example below:

For a stock/complex with a susceptibility score = 3 and a CV = 0 (or near 0) then Scalar =  $3 * [(3-0)/3] = 3$

Since CV will never = 0, then the max scalar should be set at 3.

# Control Rule Modifications

For Tier 4b modify to: scalar  $\leq 2$  depending on perceived degree of exploitation, life history and ecological function.

Rationale: In some instances the calculated scalar was greater than 1. See example below:

For a stock/complex with a susceptibility score = 1.5 and a CV = 0 (or near 0) then Scalar =  $1.5 * [(3-0)/3] = 1.5$

Since CV will never = 0, then the max scalar should be set at 2.

## Modified ABC CR for Tier 4

### Tier 4 ABC Control Rule (Landings and Ancillary Information) (e.g., Productivity-Susceptibility Analyses, Expert opinion)

4A	
<b>Conditions for use</b>	No accepted* quantitative assessment providing status determination criteria (SDC), but in the expert opinion of the SSC the stock has relatively low vulnerability to fishing pressure. A stock's vulnerability to fishing pressure is a combination of its productivity, and its susceptibility to the fishery. Productivity refers to the capacity of the stock to produce MSY and to recover if the population is depleted, and susceptibility is the potential for the stock to be impacted by the fishery (NS1). If SSC consensus cannot be reached on the use of Tier 4a, Tier 4b should be used.
<b>SYL</b>	<p><b>SYL</b> = Scalar x 75<sup>th</sup> percentile of reference period landings, <b>where the reference period of landings is determined by the Council.</b></p> <p>Scalar <math>\leq 3</math> depending on perceived degree of exploitation, life history and ecological function</p>
<b>ABC</b>	ABC = <i>buffer</i> x <b>SYL</b> , where <i>buffer</i> must be $\leq 0.9$ (e.g., 0.9, 0.8, 0.75, 0.70...).
4B	
<b>Conditions for use</b>	No accepted* quantitative assessment providing status determination criteria (SDC), but in the expert opinion of the SSC the stock has relatively high vulnerability to fishing pressure (see definition in Tier 4A Condition for Use), or SSC consensus cannot be reached on the use of Tier 4a.
<b>SYL</b>	<p><b>SYL</b> = Scalar x <i>mean</i> of the reference period landings, <b>where the reference period of landings is determined by the Council.</b></p> <p>Scalar <math>\leq 2</math> depending on perceived degree of exploitation, life history, and ecological function.</p>
<b>ABC</b>	ABC = <i>buffer</i> x <b>SYL</b> , where <i>buffer</i> must be $\leq 0.9$ (e.g., 0.9, 0.8, 0.75, 0.70...)

# Puerto Rico ABCs

Stock/Complex	Commercial			Recreational			Total		
	SYL	ABC	Old ACL	SYL	ABC	Old ACL	SYL	ABC	Old ACL
Spiny Lobster	924,968	554,981	327,920	NA	NA	0	924,968	554,981	327,920
SU1_indicator (Silk)	892,650	446,325	284,685	235,012	117,506	95,526	1,127,661	563,831	380,211
SU2_indicator (Queen)	309,041	154,520	145,916	52,577	26,288	34,810	361,617	180,809	180,726
SU3 (Lane)	643,094	321,547	345,755	52,202	26,101	83,158	695,296	347,648	428,913
SU4_indicator (Mutton)	245,125	122,562	373,295	160,317	80,159	28,509	405,442	202,721	401,804
SU5 (Yellowtail)	664,855	332,427		57,184	28,592		722,038	361,019	0
SU6 (Cubera)	251	125		11,881	5,940		12,131	6,066	0
GU3_indicator (Coney)	62,868	31,434		41,416	20,708		104,284	52,142	
GU4	6,558	5,902	177,513	10,018	9,016	77,213	16,576	14,918	
GU5	35,739	17,870		8,995	4,497		44,734	22,367	0
GU6_indicator (Red hind)	320,340	160,170		73,092	36,546		393,431	196,719	0
Parrotfish 2	347,704	173,852	52,737	44,580	22,290	15,263	392,284	196,142	68,000
Grunts (White)	374,575	187,288	182,396	5,177	2,589	5,028	379,752	189,876	187,424
Jack 1 (Crevalle)	121	61		88,198	44,099		88,319	44,160	137,060
Jack 2 (African Pompano)	2,769	1,384	86059	12,040	6,020	51,001	14,808	7,404	0
Jack 3 (Rainbow runner)	3,129	1,564		17,035	8,517		20,163	10,082	0
Surgeonfish	347	173	7179	2,023	1,012	3590	2,370	1,185	10,769
Wrasse 1 (Hogfish)	147,662	73,831	54,147	17,395	8,698	5,050	165,057	82,529	59,197
Wrasse 2	42,371	21,186		11,310	5,655		53,681	26,841	0
Angelfish	322	161	8984	7,024	3,512	4,492	7,346	3,673	13,476
Triggerfish indicator (Queen)	174,946	87,473	58,475	15,690	7,845	21,929	190,636	95,318	80,404
Tripletail	577	288	NA	82,116	41,058	NA	82,692	41,346	NA
Barracuda	1,042	521	NA	353,038	176,519	NA	354,080	177,040	NA
Mackerel	496,050	248,025	NA	221,587	110,794	NA	717,637	358,818	NA
Tuna	179,013	89,507	NA	78,612	39,306	NA	257,625	128,813	NA
Dolphin	499,215	249,608	NA	3,187,043	1,593,521	NA	3,686,258	1,843,129	NA
Wahoo	49,082	24,541	NA	100,081	50,040	NA	149,163	74,581	NA

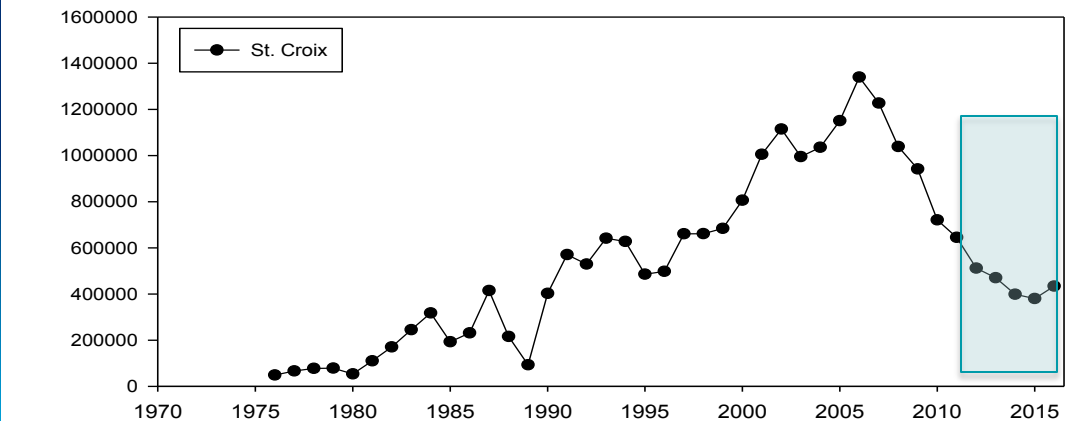
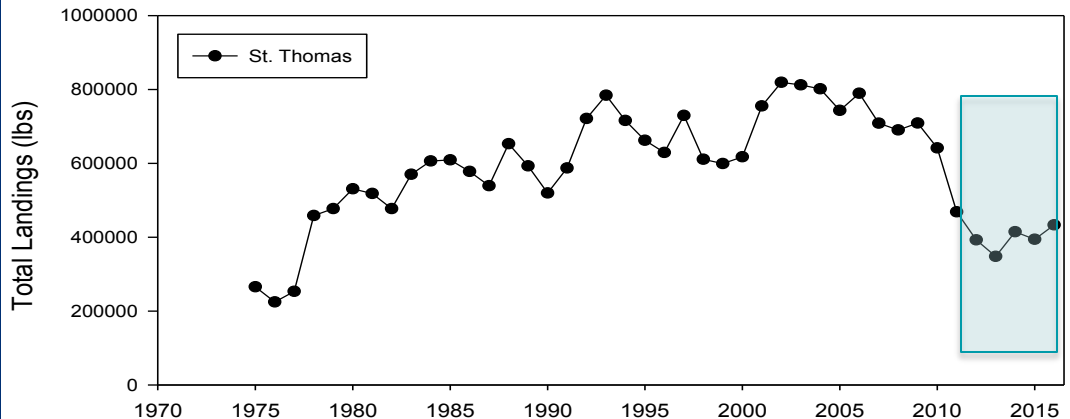
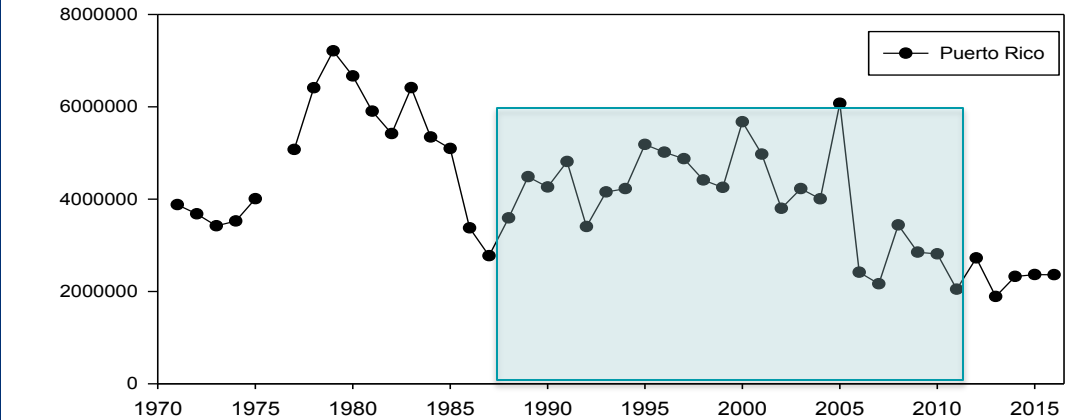
# St. Thomas/St. John ABCs

Stock/Complex	SYL	ABC	Old ACL
Lobster	309,579	185,747	104,199
SU1_indicator (Blackfin)	16,356	8,178	133,775
SU2 (Queen)	502	251	
SU3_indicator (Mutton)	25,133	12,567	
SU4 (Yellowtail)	74,253	37,126	
GU3_indicator (Red hind)	100,444	55,244	51,849
GU4_indicator (Yellowfin)	2,280	2,052	
GU5	848	424	
Parrotfish2_indicator (Redtail,Stoplight)	49,906	24,953	42,500
Grunts1_indicator (White)	24,282	12,141	37,617
Grunts2 (Margate)	2,179	1,090	
Porgies_indicator (Saucereye)	24,623	12,312	4,638
Jacks (Blue runner)	67,045	33,523	52,907
Surgeonfish_indicator (Doctorfish)	25,408	12,704	29,249
Hogfish	6,212	3,106	585
Angelfish_indicator (Gray)	43,051	21,526	7,897
Triggerfish (Queen)	125,715	62,857	74,447
Dolphin	21,090	10,545	NA
Wahoo	12,468	6,234	NA

# St. Croix ABCs

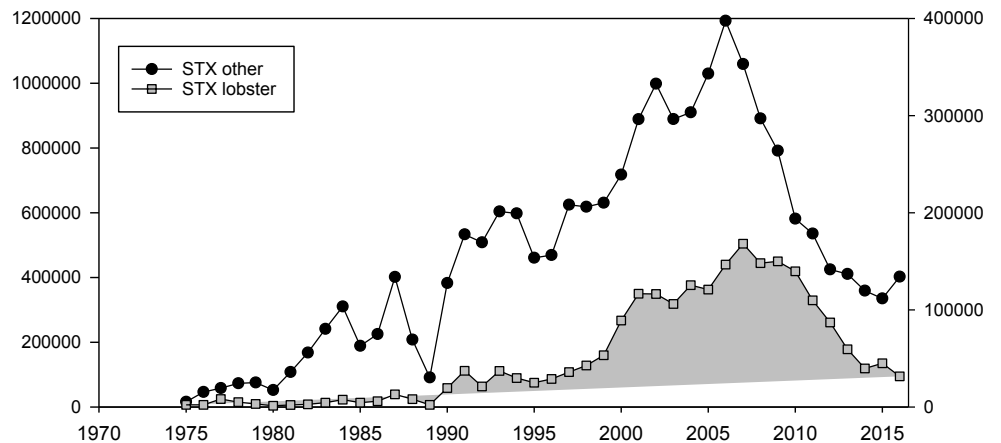
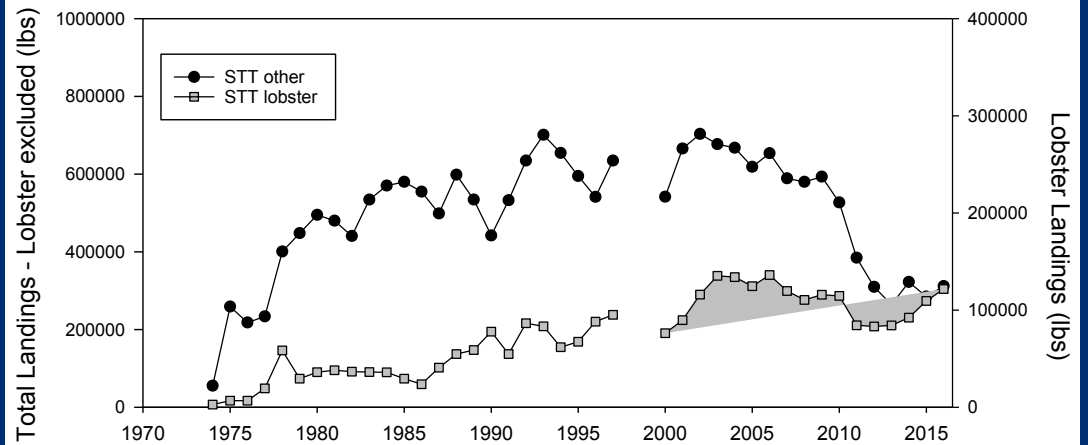
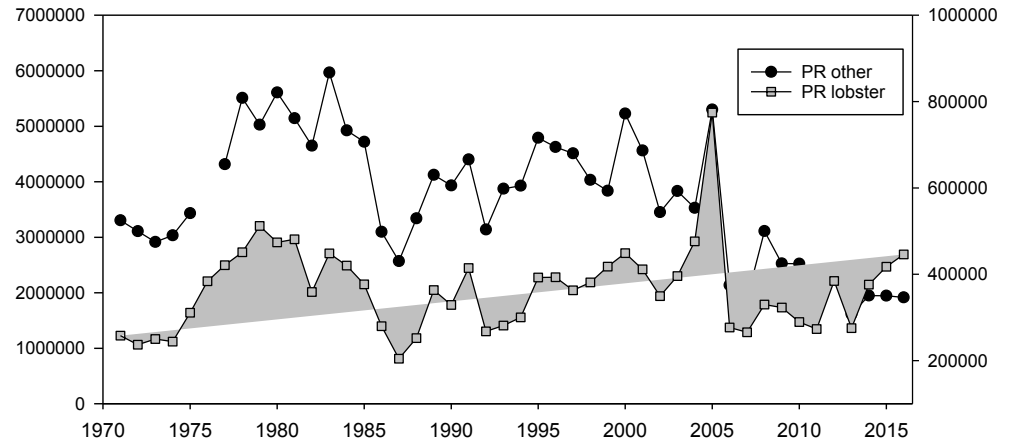
Stock/Complex	SYL	ABC	Old ACL
Lobster	127,985	76,791	107,307
SU1_indicator (Blackfin, Silk)	68,355	34,177	102,946
SU2 (Queen)	9,162	4,581	
SU3_indicator (Lane)	1,953	977	
SU4 (Mutton)	9,645	4,823	
SU5 (Schoolmaster)	22,822	11,411	
SU6 (Yellowtail)	17,113	8,557	
GU3_indicator (Coney)	21,145	10,573	30,435
GU4_indicator (Red hind)	17,415	8,707	
GU5_indicator (Yellowfin)	562	506	
GU6 (Misty)	165	82	
Parrotfish2 indicator (Redtail,Stoplight)	66,987	33,493	240,000
Angelfish	15,087	7,543	305
Grunts	27,697	13,848	36,881
Surgeonfish	24,882	12,441	33,603
Triggerfish (Queen)	17,779	8,890	24,980
Squirreelfish	6,878	3,439	121
Dolphin	153,349	76,674	NA
Wahoo	75,735	37,868	NA

# Long-term Commercial Landings: Puerto Rico, St. Thomas/St. John, St. Croix

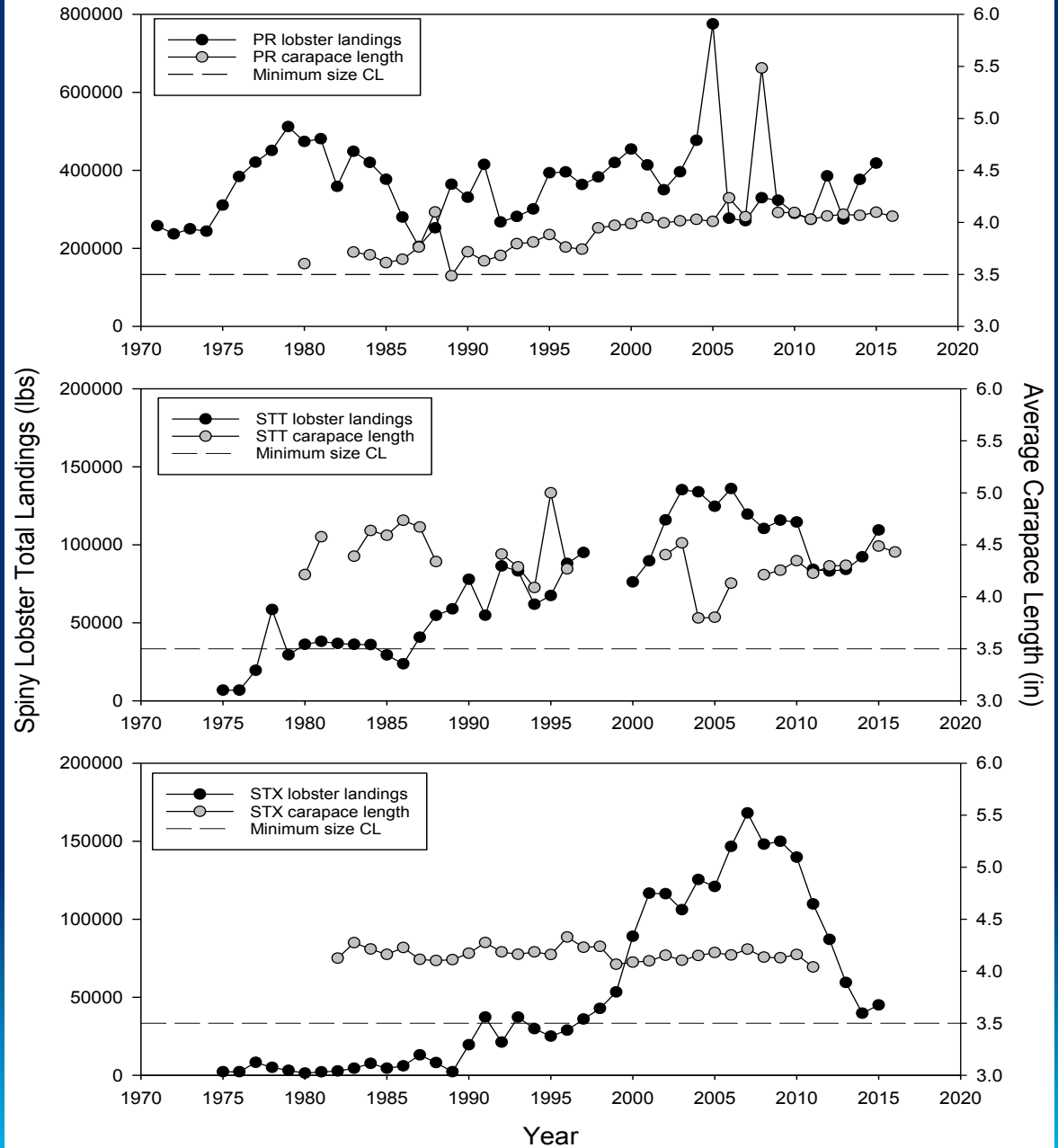




# Total Landings (all other species) vs Lobster Landings



# Spiny Lobster Landings vs. Spiny Lobster Carapace Length





# Puerto Rico ABCs

Stock/Complex	Commercial			Recreational			Total		
	SYL	ABC	Old ACL	SYL	ABC	Old ACL	SYL	ABC	Old ACL
Spiny Lobster	924,968	554,981	327,920	NA	NA	0	924,968	554,981	327,920
SU1_indicator (Silk)	892,650	446,325	284,685	235,012	117,506	95,526	1,127,661	563,831	380,211
SU2_indicator (Queen)	309,041	154,520	145,916	52,577	26,288	34,810	361,617	180,809	180,726
SU3 (Lane)	643,094	321,547	345,755	52,202	26,101	83,158	695,296	347,648	428,913
SU4_indicator (Mutton)	245,125	122,562	373,295	160,317	80,159	28,509	405,442	202,721	401,804
SU5 (Yellowtail)	664,855	332,427		57,184	28,592		722,038	361,019	0
<b>SU6 (Cubera)</b>	<b>251</b>	<b>125</b>		<b>11,881</b>	<b>5,940</b>		<b>12,131</b>	<b>6,066</b>	<b>0</b>
GU3_indicator (Coney)	62,868	31,434		41,416	20,708		104,284	52,142	
GU4	6,558	5,902	177,513	10,018	9,016	77,213	16,576	14,918	
GU5	35,739	17,870		8,995	4,497		44,734	22,367	0
GU6_indicator (Red hind)	320,340	160,170		73,092	36,546		393,431	196,719	0
Parrotfish 2	347,704	173,852	52,737	44,580	22,290	15,263	392,284	196,142	68,000
Grunts (White)	374,575	187,288	182,396	5,177	2,589	5,028	379,752	189,876	187,424
<b>Jack 1 (Crevalle)</b>	<b>121</b>	<b>61</b>		<b>88,198</b>	<b>44,099</b>		<b>88,319</b>	<b>44,160</b>	<b>137,060</b>
Jack 2 (African Pompano)	2,769	1,384	<b>86059</b>	12,040	6,020	<b>51,001</b>	14,808	7,404	0
Jack 3 (Rainbow runner)	3,129	1,564		17,035	8,517		20,163	10,082	0
<b>Surgeonfish</b>	<b>347</b>	<b>173</b>	<b>7179</b>	<b>2,023</b>	<b>1,012</b>	<b>3590</b>	<b>2,370</b>	<b>1,185</b>	<b>10,769</b>
Wrasse 1 (Hogfish)	147,662	73,831	54,147	17,395	8,698	5,050	165,057	82,529	59,197
Wrasse 2	42,371	21,186		11,310	5,655		53,681	26,841	0
<b>Angelfish</b>	<b>322</b>	<b>161</b>	<b>8984</b>	<b>7,024</b>	<b>3,512</b>	<b>4,492</b>	<b>7,346</b>	<b>3,673</b>	<b>13,476</b>
Triggerfish indicator (Queen)	174,946	87,473	58,475	15,690	7,845	21,929	190,636	95,318	80,404
<b>Tripletail</b>	<b>577</b>	<b>288</b>	<b>NA</b>	<b>82,116</b>	<b>41,058</b>	<b>NA</b>	<b>82,692</b>	<b>41,346</b>	<b>NA</b>
<b>Barracuda</b>	<b>1,042</b>	<b>521</b>	<b>NA</b>	<b>353,038</b>	<b>176,519</b>	<b>NA</b>	<b>354,080</b>	<b>177,040</b>	<b>NA</b>
Mackerel	496,050	248,025	NA	221,587	110,794	NA	717,637	358,818	NA
Tuna	179,013	89,507	NA	78,612	39,306	NA	257,625	128,813	NA
Dolphin	499,215	249,608	NA	3,187,043	1,593,521	NA	3,686,258	1,843,129	NA
Wahoo	49,082	24,541	NA	100,081	50,040	NA	149,163	74,581	NA

## **EIS Action 3** *(Alt 4. Cont.)*

### **B. Optimum Yield (OY) and Annual Catch Limit (ACL)**

Determine the OY and the ACL based on the formula in one of the sub-alternatives below and the ABC established in Alternative 4, Section A above.

**Sub-Alternative 4a.**  $OY = ACL = ABC$

**Sub-Alternative 4b.**  $OY = ACL = ABC \times 0.90$

**Sub-Alternative 4c.**  $OY = ACL = ABC \times 0.85$

**Sub-Alternative 4d.**  $OY = ACL = ABC \times 0.75$

**Sub-Alternative 4e.**  $OY = ACL = 0$

# Tier 4a

## Tier 4A

**SYL = 75<sup>th</sup> percentile of landings x SCALAR (calculated separately for commercial and recreational)**

**SCALAR = Inverted Susceptibility Score x Variability Adjustment Factor (VAF)**

**VAF = [(3-Coefficient of Variation)/3]**

**where 3 = max susceptibility score and CV = standard deviation/mean**

**If CV >1, then CV set = 1**

**Additional reductions for species with ecological importance:**

**Parrotfish (PR, STT) x 0.85 (additional 15% reduction)**

**Parrotfish (STX) x 0.80 (additional 20% reduction)**

**Angelfish (PR, STT, STX) x 0.75 (additional 25% reduction)**

**Surgeonfish (PR, STT, STX) x 0.75 (additional 25% reduction)**

**ABC = SYL x BUFFER**

**BUFFER = 0.5 for PR, STT, and STX stocks/complexes with the below exceptions:**

**BUFFER = 0.55 for red hind in STT**

**BUFFER = 0.60 for lobster all islands**

**Additional reductions to account for unspecified landings:**

**If unspecified are <10% of total ref period, then do not adjust baseline buffer**

**If unspecified are 10-35% of total ref period, then reduce baseline buffer by 0.05**

**If unspecified are >35% of total ref period, then reduce baseline buffer by 0.1**

# EIS Action 4

## Essential Fish Habitat (EFH) Description and Identification for Species Not Previously Managed in Federal Waters of *X Island*

**Alternative 1.** No action. Do not describe and identify EFH for species not previously managed in federal waters of *X Island*.

**Alternative 2.** Describe and identify EFH according to functional relationships between life history stages of federally-managed species and *X Island* marine and estuarine habitats.

# EIS Action 4

**Alternative 3.** Use other method(s) to describe and identify EFH for species not previously managed in federal waters of *X Island*. The March 2004 Final EIS for the Generic EFH Amendment explored a number of concepts that could be used depending on data availability. Some of these methods for describing EFH include:

- 1) Designating EFH based on distribution data (distribution of habitat types, fish species and fishing effort) (*Level 1 data – surveys of presence/absence; simple habitat/species associations*).
- 2) Designating EFH based on habitat-related densities of the species (EFH would be defined as the area where the density or relative abundance of a species life stage is above a threshold level) (*Level 2 – Survey/fishery related CPUE as proxy for density; or spatial modeling of probability of occurrence, or other forms of habitat suitability models*).
- 3) Using spatial data to designate EFH (Level 2 - *would use spatially explicit, qualitative or quantitative information that link fish distributions and habitat to describe and identify EFH*).

*(Continues on next slide)*



## **EIS Action 4 (*Alt. 3 Cont.*)**

- 4) Habitat suitability models (uses habitat suitability modeling prepared by NOS to infer information about species distribution, and possibly relative density (i.e. assuming that habitats with a higher suitability support greater abundances of a species life stage).
- 5) Designating EFH based on data on growth, reproduction, or survival rates within habitats (obtained from tagging data (growth), fecundity data by area).
- 6) Designating EFH based on production rates by habitat.

# EIS Action 5

## Framework Procedures for each of the Island-Based FMPs

- Alternative 1.** No action. Do not modify the existing framework procedure for implementing management measures in the *X Island* FMP.
- Alternative 2.** Adopt the base Framework Procedure listed in Table X.
- Alternative 3.** Adopt the more broad Framework Procedure listed in Table Y.
- Alternative 4.** Adopt the more narrow Framework Procedure listed in Table Z.

# Action 5: Framework (FMW) Procedures - Summary comparison of draft alternatives

	Alternative 2 (base)	Alternative 3 (broad)	Alternative 4 (narrow)
<b>Types of Framework Processes</b>	<ul style="list-style-type: none"> <li>- <b>Open abbreviated (Abbv.)</b></li> <li>- Open Standard</li> <li>- Closed</li> </ul>	<ul style="list-style-type: none"> <li>- Open</li> <li>- Closed</li> </ul>	<ul style="list-style-type: none"> <li>- Open</li> <li>- Closed</li> </ul>
<b>When can open framework be used</b>	<ul style="list-style-type: none"> <li>- New stock assessment or other information for changes to OFL, ABC, or other assoc. parameters.</li> <li>- New info or circumstances</li> <li>- When changes are required to comply with applicable law or court order.</li> </ul> <p><b>Abbreviated FMW can be used for minor or insignificant changes.</b> Standard framework for all other allowed changes.</p>	In response to <b>any</b> additional information or changed circumstances.	<ul style="list-style-type: none"> <li>- <b>Only when new stock assessment or other information for changes to OFL, ABC, or other assoc. parameters.</b></li> </ul>
<b>Actions that can be taken</b>	<ul style="list-style-type: none"> <li>- <b>Abbreviated Open FMW</b> can be used for actions that are considered <b>minor and insignificant</b></li> <li>- Standard Open FMW. Used for all others. <b>List of actions</b> that can be taken under Abbv. and Standard Open FMW are given.</li> <li>- <b>Closed FMW can be used for a specific list of actions.</b></li> </ul>	<ul style="list-style-type: none"> <li>- Open FMW can be used for a representative <b>list of actions, plus other measures</b> deemed appropriate by the Council.</li> <li>- Closed FMW can be used for a specific list of actions, <b>plus any other immediate actions specified in the regulations.</b></li> </ul>	<ul style="list-style-type: none"> <li>- <b>Open FMW can only be used for specific listed actions.</b></li> <li>- <b>Closed FMW can be used for a specific list of actions.</b></li> </ul>
<b>Public Input</b>	Requires public discussion in <b>at least one</b> Council meeting.	Requires public discussion at <b>one</b> Council meeting	Requires public discussion during at <b>least three</b> Council meetings, and discussion at <b>separate public hearings</b> within the areas most affected by the proposed measures.
<b>APs/SSC participation</b>	The Council <b>may convene</b> its SSC or an AP(s), as appropriate	<b>Convening</b> the SSC or an AP(s) prior to final action is <b>not required.</b>	The Council <b>shall convene</b> its SSC and an AP(s).
<b>How is a request of action made</b>	<ul style="list-style-type: none"> <li>- <b>Abbv. requires a letter or memo from the Council with supporting analyses</b></li> <li>- Standard requires a completed FMW document with supporting analyses.</li> </ul>	Via letter, memo, or the completed FMW document with supporting analyses.	Via letter, memo, or the completed FMW document with supporting analyses.



# Puerto Rico ABCs

Stock/Complex	Commercial			Recreational			Total		
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GU3_indicator (Coney)	62,868	25,147		41,416	16,566		104,284	41,714	254,726
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Surgeonfish	347	139	7179	2,023	809	3590	2,370	948	10,769
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Tripletail	577	260	NA	82,116	36,952	NA	82,692	37,212	NA
Barracuda	1,042	417	NA	353,038	141,215	NA	354,080	141,632	NA
Mackerel	496,050	223,222	NA	221,587	99,714	NA	717,637	322,937	NA
Tuna	179,013	80,556	NA	78,612	35,375	NA	257,625	115,931	NA
Dolphin	499,215	249,608	NA	3,187,043	1,593,521	NA	3,686,258	1,843,129	NA
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