Outreach and Education Advisory Panel (OEAP)

REPORT TO THE COUNCIL

176th CFMC Regular Meeting

Virtual and in person

December 7 -8, 2021

Marriott Courtyard Hotel Isla Verde, PR

Meetings attended

Marine Resource Education Program (MREP) meetings to review content of Puerto Rico Fishers' Workshop in August 2022.

Webinars: FAO Ocean Decade, 2022 Year of Artisanal Fisheries and Aquaculture, impact of Sargassum accumulation on fisheries, importance of MPAs for sustainable fisheries, climate change and fisheries and, fisheries management in the Caribbean.

Importance of these issues for O & E initiatives.

Updates on O &E initiatives proposed for 2022 - 2025

- **Calendar 2022 MAPs**

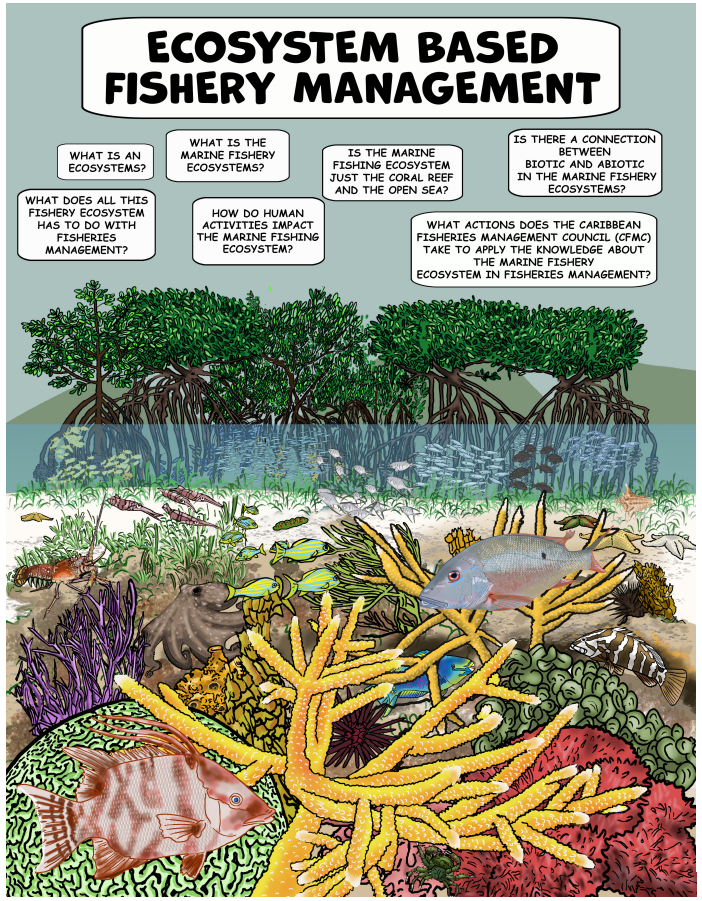
- **January, February, March, April) MPAs in PR**: Bajo de Sico, AbrirLa Sierra,Tourmaline, Reserva Marina de la Parguera.
- **May, June, July, August) MPAs in St. Thomas/St. John:** Red Hind Bank Marine Conservation District, Grammanik Bank, Virgin Islands National Park, Virgin Islands Coral Reef National Monument .
- **September, October, November, December MPAs in St. Croix**: Lang Bank Red Hind Spawning Aggregation Area, Mutton Snapper Spawning Aggregation Area, Buck Island Reef National Monument, St. Croix East End Marine Park.
- **For 2023: Fisher's Families. Please, contribute potos and information**

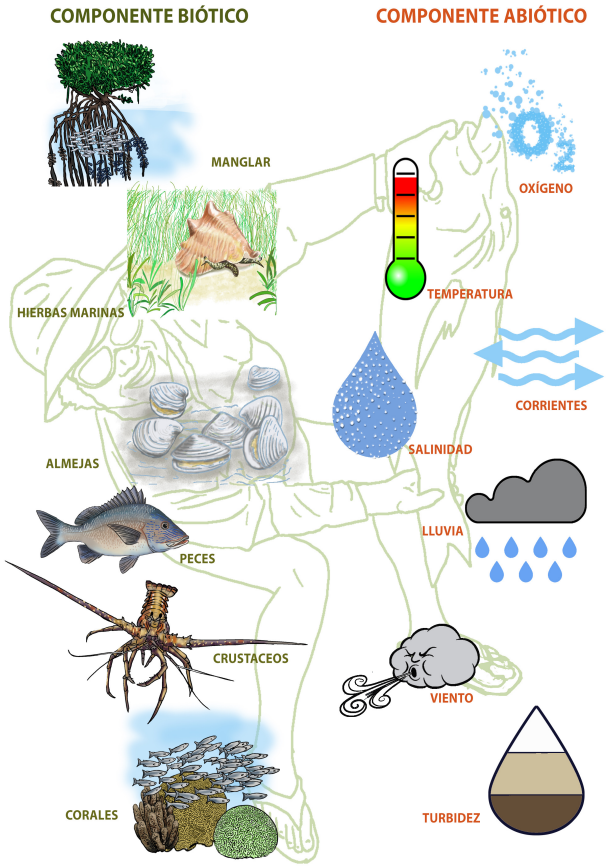
Updates on current O &E products

Illustrated Booklet on EBFM

16 questions

1. What is an ecosystem?
2. What is the marine fishery ecosystem?
3. Is there a connection between biotic and abiotic in the marine fishery ecosystem?
4. Is the marine fishing ecosystem just the coral reef and the open sea?
5. How do human activities impact the marine fishing ecosystem?
6. What does all this fishery ecosystem has to do with fisheries management?
7. What actions does the CFMC take to apply the knowledge about the marine fishery ecosystem in fisheries management?.....

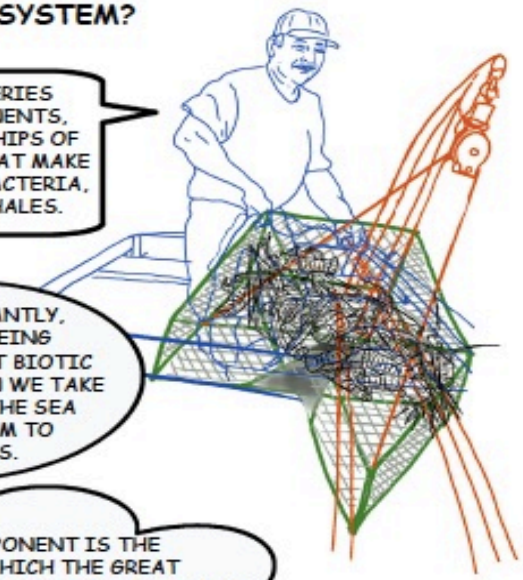




WHAT IS THE MARINE FISHERY ECOSYSTEM?

THE MARINE ECOSYSTEM IN FISHERIES IS THE SUM OF THE BIOTIC COMPONENTS, INCLUDING ECOLOGICAL RELATIONSHIPS OF THE FISH AND ALL OTHER SPECIES THAT MAKE UP OUR FISHERIES, RANGING FROM BACTERIA, ALGAE, AND INVERTEBRATES TO WHALES.

MOST IMPORTANTLY, THE HUMAN BEING IS AN IMPORTANT BIOTIC COMPONENT WHEN WE TAKE SPECIES FROM THE SEA TO BRING THEM TO OUR TABLES.

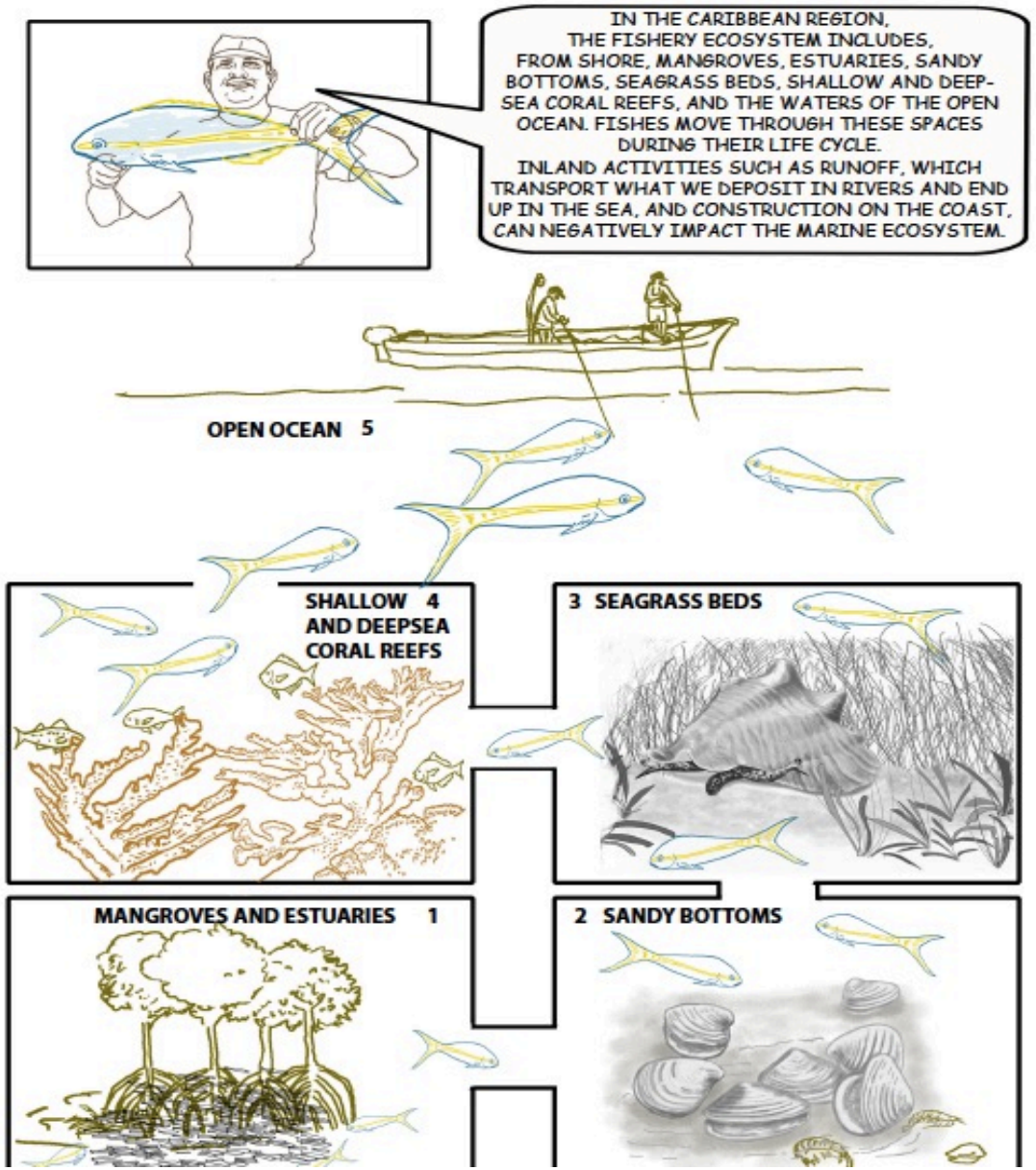


THE ABIOTIC COMPONENT IS THE ENVIRONMENT IN WHICH THE GREAT DIVERSITY OF ORGANISMS LIVES AND INCLUDES FACTORS SUCH AS: 1) WATER, 2) TEMPERATURE, 3) LIGHT PENETRATION, 4) SALINITY, 45 NUTRIENTS, 6) DEPTH, 7) SUBSTRATE, OR SEABED, AND 8) OCEAN CURRENTS. THESE CONDITIONS DEFINE THE PHYSICAL AND CHEMICAL HABITAT FOR ALL SPECIES IN THE ECOSYSTEM.

IS THERE A CONNECTION BETWEEN BIOTIC AND ABIOTIC IN THE MARINE FISHERY ECOSYSTEM?

DIFFERENT PROCESSES IN THE ECOSYSTEM CONNECT ONE SPECIES TO ANOTHER, ESPECIALLY THROUGH FOOD WEBS. ALSO, BIOGEOCHEMICAL CYCLES CONNECT THE ABIOTIC COMPONENT WITH THE BIOTIC COMPONENT. FOR EXAMPLE, CORALS, WHICH MAKE UP REEFS, OBTAIN CALCIUM CARBONATE FROM SEAWATER WITH WHICH THEY FORM THE EXTERNAL SKELETON, AND THE CONCH USES IT TO FORM ITS SHELL. THE OCEAN CURRENTS AND TIDES CONNECT FROM THE SHORE TO THE DEEP WATERS AND FROM OTHER AREAS WHERE THEY COME FROM.

IS THE MARINE FISHING ECOSYSTEM JUST THE CORAL REEF AND THE OPEN SEA?



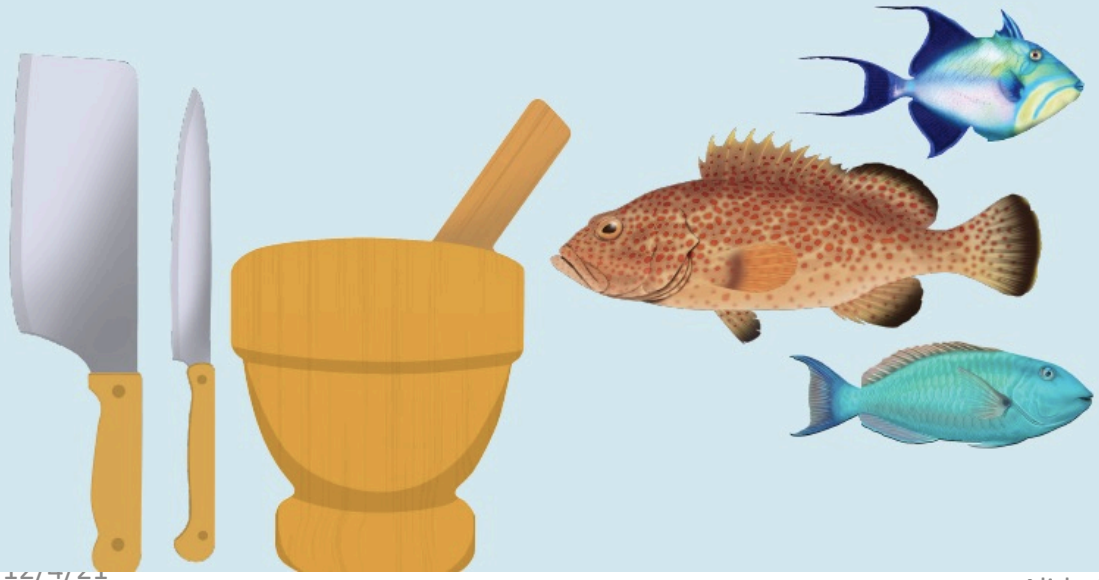
HOW DO HUMAN ACTIVITIES IMPACT THE MARINE FISHING ECOSYSTEM?

SUSTAINABLE SEAFOOD CONSUMPTION CAMPAIGN: Recipe Book

Recipes for cooking underutilized... but delicious

fish and seafood

species in Puerto Rico and the U.S. Virgin Islands



Blue runner
(*Caranx crysos*)

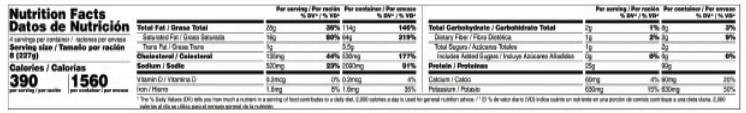
Blue runner shallow poach in coconut water served with rum coconut butter

- Juan C. Vicens

(4 portions)

2 lb / .9 k cleaned blue runner filets cut in 8oz / 113g portions
Salt, pepper (optional) to taste
16 oz / 473 ml pure coconut water
2 ea bay leaves
8 ea garlic cloves
4 oz / 118 ml white rum
2 oz / 59 ml limejuice
8 oz / 113 g cold butter cut in cubes
4 oz / 118 ml heavy cream
2 oz / 56 g Chopped fresh herbs (parsley, cilantro, culantro)

1. Ina medium size pan prepare the poaching liquid, combine coconut water, garlic cloves, bay leaves, rum, limejuice and condiments.
2. Heat at medium heat (Must not boil) 185º F / 86º C. Carefully add the fish filets, cook about 3 minutes each side.
3. When cooked, remove the fish to a plate.
4. Increase heat to medium hi and reduce liquid to a third.
5. Add whole butter, stir to blend and have a creamy sauce. Add heavy cream and keep cooking until it blend in. Taste and adjust flavor if necessary. Serve over fish.



Nutrition Facts / Datos de Nutrición

Serving size / Tamaño por ración: 8 (227g)

Calories / Calorías: 390 | 1560

	Per serving / Por ración	% DV* / % VD*	Per container / Por envase	% DV* / % VD*
Total Fat / Grasa Total	28g	36%	114g	146%
Saturated Fat / Grasa Saturada	16g	80%	64g	319%
Trans Fat / Grasa Trans	1g		3.5g	
Cholesterol / Colesterol	135mg	44%	530mg	177%
Sodium / Sodio	520mg	23%	2080mg	91%
Vitamin D / Vitamina D	0.3mcg	0%	0.2mcg	4%
Iron / Hierro	1.8mg	9%	1.6mg	35%
Total Carbohydrate / Carbohidrato Total	0g	1%	0g	3%
Dietary Fiber / Fibra Dietética	1g	2%	0g	9%
Total Sugars / Azúcares Totales	1g		0g	
Includes Added Sugars / Incluye Azúcares Añadidos	0g	0%	0g	0%
Protein / Proteínas	35g		90g	
Calcium / Calcio	60mg	4%	90mg	20%
Potassium / Potasio	630mg	15%	630mg	50%

* The % Daily Values (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice. / El % de valor diario (VD) indica cuánto un nutriente en una porción de comida contribuye a una dieta diaria. 2,000 calorías al día se utilizan para el consejo general de la nutrición.

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Kalaloo - Carlos Farchette

Kalaloo is the national dish of the Virgin Islands and is quite different from dishes of the same name made in neighboring islands. It is a thick soup or stew made with meats, seafood, vegetables and herbs. It is very nutritious!

1 lb / 454 g cooking ham
1 lb / 454 g pigs' tail or snout
1 lb / 454 g salted beef
2 ea large tania leaves, yautía leaf
3-cup papalulu leaves papaya leaves
2-cup bata-bata leaves
2-cup white Mary leaves
2-cup fresh okra
1 ea medium sized hot pepper, chopped
1½ lb / 680 g queen conch meat
2 ea land crabs
1 lb / 454 g octopus
2 cups fish meat (usually queen trigger or princess parrotfish)

1. Soak salted meats such as the ham, pigtails or snout overnight, discard water the next day.
2. Boil meats until tender.
3. Boil conch until tender and set aside.
4. Cook fish, remove bones and set aside.
5. Boil octopus until tender and set aside
6. Prepare greens: pick leaves from stem wash, drain and grind leaves in blender
7. Prepare fresh land crab: scrub thoroughly, section and cook in boiling water until shell changes color. Drain.
8. In large pot cut up conch and meats and bring to a boil. Add leafy herbs, okra and continue to cook.
9. Add fish and crab sections lastly. When herbs and greens turn a dark color and okra seeds turn pink the dish is ready to serve. Add salt and pepper to taste. Cooking time being about 2 hours.

Kalaloo (substitute ingredients)

The following ingredients, which can be easily found in grocery stores, will give a good approximation of the old-time Crucian Kalaloo with much less work and a cooking time of about 45 minutes.

1 lb / 454 g fresh ham
2 lb / 908 g spinach, fresh, frozen or canned
2 lb / 908 g collard greens, fresh frozen or canned
1 can 12 oz cooked conch
1 can 8o z crab meat
1 cup cooked fish
Follow directions in original recipe for cooking.

Nutrition Facts / Datos de Nutrición

	Per serving / Por ración	Per container / Por envase
Total Fat / Grasa Total	8g 10%	15g 194%
Saturated Fat / Grasa Saturada	3g 14%	56g 278%
Trans Fat / Grasa Trans	0g	0g
Cholesterol / Colesterol	45mg 14%	669mg 204%
Sodium / Sodio	540mg 23%	10770mg 468%
Vitamin D / Vitamina D	0.3mcg 0%	0.3mcg 2%
Iron / Hierro	3.6mg 20%	5.6mg 430%

	Per serving / Por ración	Per container / Por envase
Total Carbohydrate / Carbohidrato Total	0g 1%	62g 22%
Dietary Fiber / Fibra Dietética	1g 3%	10g 37%
Total Sugars / Azúcares Totales	0g	31g
Includes Added Sugars / Incluye Azúcares Añadidos	0g 0%	0g 0%
Protein / Proteínas	24g	487g
Calcium / Calcio	70mg 6%	70mg 110%
Potassium / Potasio	410mg 9%	410mg 166%

Ingredients: Conch, Baked or Broiled, Parrot Fish, Raw, Beef jerky, Octopus, Common, Cooked, Moist Heat, Pork or Ham Hock, Cooked, Pig Tongue, Knobbelaker, konserves (Crab Claws, Meat, Canned), Okra, Swiss Chard, Taro Leaves, Raw, Sweet potato leaves, squash leaves, pumpkin leaves, chrysanthemum leaves, bean leaves, or swamp cabbage, cooked, fat added in cooking, Knobbelaker, rk (Crab Claws, Meat, Raw), Pepper, Hot Chili, Green

Contains: Crustacean Shellfish, Fish

Ingredientes: Conch, Baked or Broiled, Parrot Fish, Raw, Beef jerky, Octopus, Common, Cooked, Moist Heat, Pork or Hum Hock, Cooked, Pig Tongue, Knobbelaker, konserves (Crab Claws, Meat, Canned), Okra, Swiss Chard, Taro Leaves, Raw, Sweet potato leaves, squash leaves, pumpkin leaves, chrysanthemum leaves, bean leaves, or swamp cabbage, cooked, fat added in cooking, Knobbelaker, rk (Crab Claws, Meat, Raw), Pepper, Hot Chili, Green

Contiene: crustáceos y mariscos, pescado

Tripletail
(*Lobotes surinamensis*)

Tripletail Amandine - Cedric Taquin

(4 portions)

4 – 8 oz / 4 – 227 g portions of tripletail fillets
Salt and pepper to taste
4 oz / 113 g all-purpose flour
6 oz / 170 g butter
2 fl oz / 60 ml white wine
4 oz / 113 g sliced almonds
3 tbsp / 18 g chopped parsley
2ea limes (juice)
1 minced garlic clove, optional
Oil for sautéing

Procedure:

1. Season fish, dredge fillets in the flour and pat off excess.
2. Warm non-stick pan. Add oil.
3. Cook the fillets lightly on each side until lightly golden. Immediately add and melt the butter
4. Add garlic and almonds and gently toast in the hot butter constantly swirling the fillets in the pan and spooning butter and almonds over fillets to finish cooking.
5. Add white wine, lime and parsley to finish. Allow to dry wine and lime for a few seconds while spooning juices on fillets. Serve immediately.

Nutrition Facts / Datos de Nutrición Servings / Raciones: 4, **Serv. size / Tamaño por ración: 6 oz. (326g),**
Amount per serving / Cantidad por ración: **Calories / Calorías 600,** **Total Fat / Grasa Total** 41g (53% DV* / % VD*), Saturated Fat / Grasa Saturada 16g (80% DV* / % VD*), Trans Fat / Grasa Trans 1g, **Cholesterol / Colesterol** 145mg (49% DV* / % VD*), **Sodium / Sodio** 910mg (40% DV* / % VD*), **Total Carbohydrate / Carbohidrato Total** 9g (3% DV* / % VD*), Dietary Fiber / Fibra Dietética 4g (14% DV* / % VD*), Total Sugars / Azúcares Totales 2g (Includes 0g Added Sugars / Incluye 0g Azúcares Añadidos, 0% DV* / % VD*), **Protein / Proteínas** 51g, Vitamin D / Vitamina D (100% DV* / % VD*), Calcium / Calcio (8% DV* / % VD*), Iron / Hierro (15% DV* / % VD*), Potassium / Potasio (25% DV* / % VD*)
Ingredients: Pargo legítimo cru (Red porgy, raw), Butter, Salted, Almonds, Sliced, Juice, Lime, Wine, White, Oil, Corn, Parsley, Chopped, Salt, Table, Garlic Clove, Pepper, Black, Ground
Contains: Tree Nuts, Fish, Wheat
Ingredientes: Pargo legítimo cru (Red porgy, raw), Butter, Salted, Almonds, Sliced, Juice, Lime, Wine, White, Oil, Corn, Parsley, Chopped, Salt, Table, Garlic Clove, Pepper, Black, Ground
Contiene: nueces de árbol, pescado, trigo

Blue runner
(*Caranx crysos*)

Blue Runner wrap in banana leaves - Wanda Pantojas

(4 portions)

4 ea whole and cleaned blue runners
4 oz / 120 ml olive oil
Salt and pepper to taste
3 ea bananas leaves (big size)
2 ea celery stalk, medium, diced
1 ea onion, sliced thin
1 ea red bell pepper, sliced thin
1½ oz / 45 g seaweed
12 ea lemons slices for garnish

1. Rub the fish with olive oil, salt and pepper. Keep fish cold.
2. Place the banana leaf over the heat (on top of the burner), to soften until glossy.
3. Cut the leaves into four rectangles.
4. Place the vegetables in the center of the leaves. Season the vegetables with olive oil, salt and pepper.
5. On top of the vegetables, place the blue runner and 3 lemon slices for garnish.
6. Fold the leave lengthwise, turn side toward middle, turn ends down and tie across.
7. Bake at 325 grades F. (163 grade C.) for 25 minutes.

Note:

1. Serve with rice and chickpeas, tossing with bacon.

Nutrition Facts / Datos de Nutrición

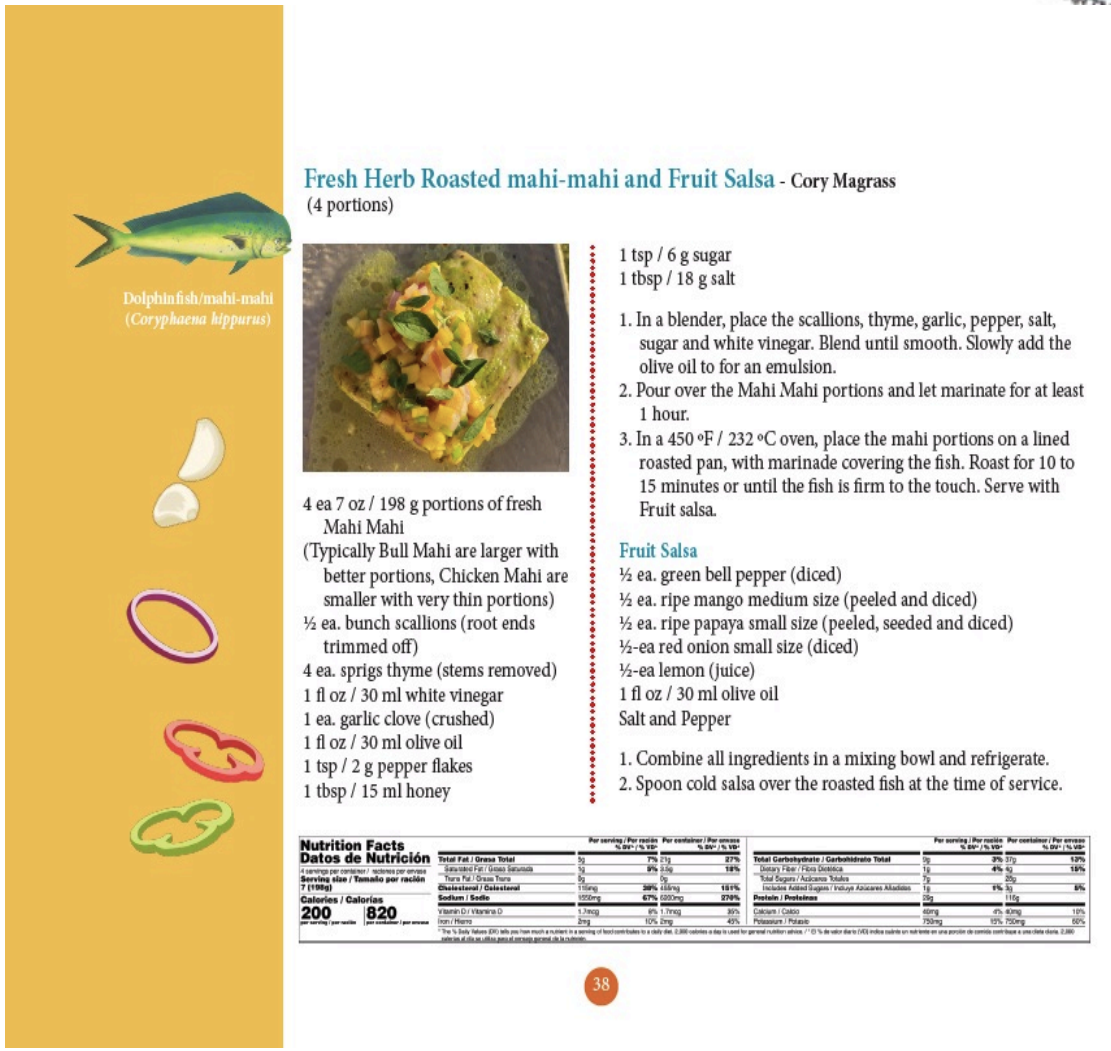
	Per serving / Por ración	% DV* / % VD*	Per container / Por envase	% DV* / % VD*
Total Fat / Grasa Total	33g	**39%**	127g	**155%**
Saturated Fat / Grasa Saturada	5g	**25%**	20g	**101%**
Trans Fat / Grasa Trans	0g		0g	
Cholesterol / Colesterol	155mg	**51%**	616mg	**203%**
Sodium / Sodio	980mg	**39%**	3930mg	**161%**
Vitamin D / Vitamina D	7.4mcg	35%	7.4mcg	150%
Iron / Hierro	1.7mg	10%	1.7mg	35%

	Per serving / Por ración	% DV* / % VD*	Per container / Por envase	% DV* / % VD*
Total Carbohydrate / Carbohidrato Total	4g	**2%**	17g	**6%**
Dietary Fiber / Fibra Dietética	1g	**4%**	4g	**16%**
Total Sugars / Azúcares Totales	2g		8g	
Includes Added Sugars / Incluye Azúcares Añadidos	0g	**0%**	0g	**0%**
Protein / Proteínas	53g		210g	
Calcium / Calcio	40mg	4%	40mg	10%
Potassium / Potasio	1100mg	25%	1100mg	90%

Ingredients: Bluefish, Baked or Broiled, Pepper, Bell or Sweet, Red, Onions, Chopped, Oil, Olive, Celery, Stalk, Seaweed, Lower (Nori), Salt, Table, Pepper, Black, Ground
Contains: Crustacean Shellfish, Fish
Ingredientes: Bluefish, Baked or Broiled, Pepper, Bell or Sweet, Red, Onions, Chopped, Oil, Olive, Celery, Stalk, Seaweed, Lower (Nori), Salt, Table, Pepper, Black, Ground
Contiene: crustáceos y mariscos, pescado

Sustainable Sea food Consumption… Other products

- Short videos on home cooking of underutilized species – Jannette Ramos and Cristina Olán.
- Develop a **Guide to analyze underutilized species for educational purposes.** It will help fishermen, fisheries managers, educators and the general public to understand what is an underutilized species and the appropriate considerations when recommending its consumption.



Dolphinfish/mahi-mahi
(*Coryphaena hippurus*)

Fresh Herb Roasted mahi-mahi and Fruit Salsa - Cory Magrass
(4 portions)

4 ea 7 oz / 198 g portions of fresh Mahi Mahi
(Typically Bull Mahi are larger with better portions, Chicken Mahi are smaller with very thin portions)
½ ea. bunch scallions (root ends trimmed off)
4 ea. sprigs thyme (stems removed)
1 fl oz / 30 ml white vinegar
1 ea. garlic clove (crushed)
1 fl oz / 30 ml olive oil
1 tsp / 2 g pepper flakes
1 tbsp / 15 ml honey
1 tsp / 6 g sugar
1 tbsp / 18 g salt

1. In a blender, place the scallions, thyme, garlic, pepper, salt, sugar and white vinegar. Blend until smooth. Slowly add the olive oil to for an emulsion.
2. Pour over the Mahi Mahi portions and let marinate for at least 1 hour.
3. In a 450 °F / 232 °C oven, place the mahi portions on a lined roasted pan, with marinade covering the fish. Roast for 10 to 15 minutes or until the fish is firm to the touch. Serve with Fruit salsa.

Fruit Salsa
½ ea. green bell pepper (diced)
½ ea. ripe mango medium size (peeled and diced)
½ ea. ripe papaya small size (peeled, seeded and diced)
½-ea red onion small size (diced)
½-ea lemon (juice)
1 fl oz / 30 ml olive oil
Salt and Pepper

1. Combine all ingredients in a mixing bowl and refrigerate.
2. Spoon cold salsa over the roasted fish at the time of service.

Nutrition Facts / Datos de Nutrición
Serving size / Tamaño por ración 7 (198g)
Calories / Calorías 200 820

	Per serving / Por ración	Per container / Por envase
Total Fat / Grasa Total	5g 7%	21g 27%
Saturated Fat / Grasa Saturada	1g 9%	3.6g 18%
Trans Fat / Grasa Trans	0g	0g
Cholesterol / Colesterol	110mg 38%	488mg 161%
Sodium / Sodio	1550mg 67%	6810mg 296%
Vitamin D / Vitamina D	1.7mcg 9%	1.7mcg 39%
Iron / Hierro	2mg 10%	2mg 45%

	Per serving / Por ración	Per container / Por envase
Total Carbohydrate / Carbohidrato Total	0g 3%	37g 13%
Dietary Fiber / Fibra Dietética	1g 4%	4g 15%
Total Sugars / Azúcares Totales	7g	25g
Includes Added Sugars / Incluye Azúcares Añadidos	1g 1%	3g 5%
Protein / Proteínas	28g	116g
Calcium / Calcio	40mg 4%	40mg 15%
Potassium / Potasio	750mg 15%	750mg 16%

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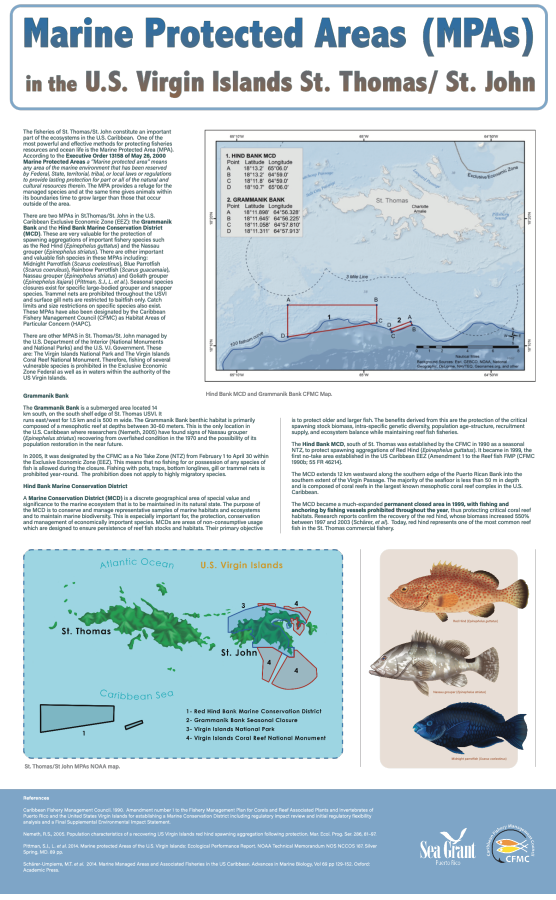
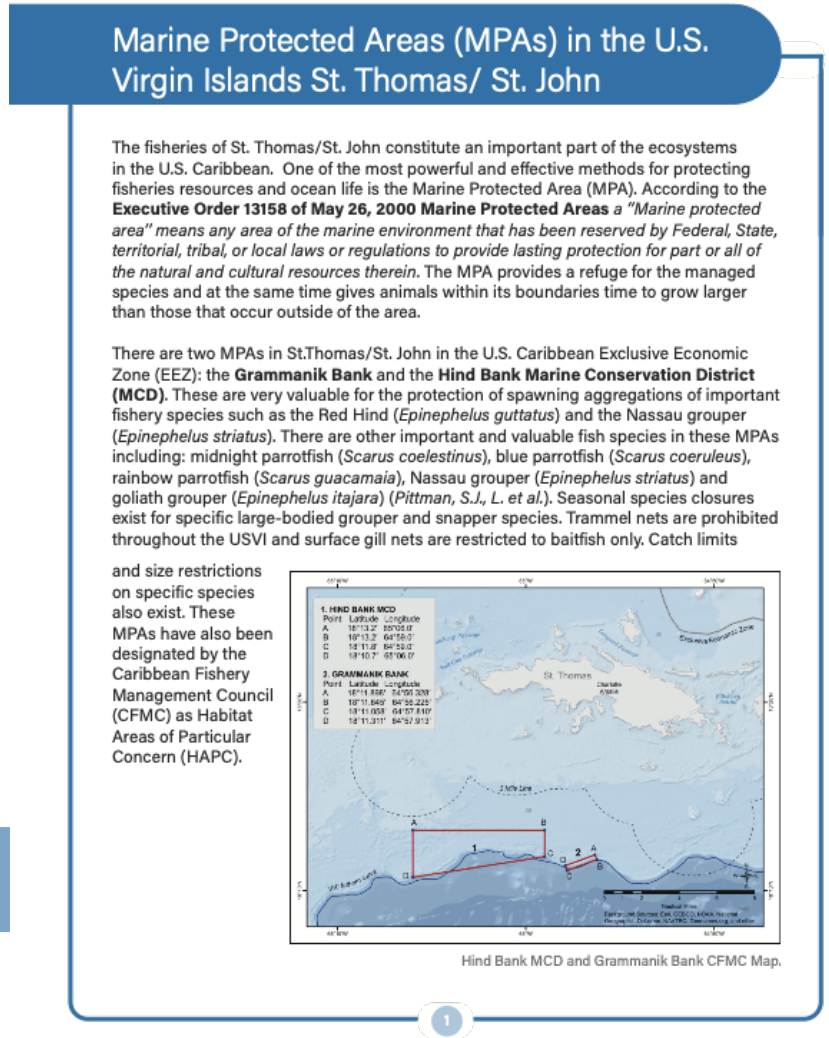
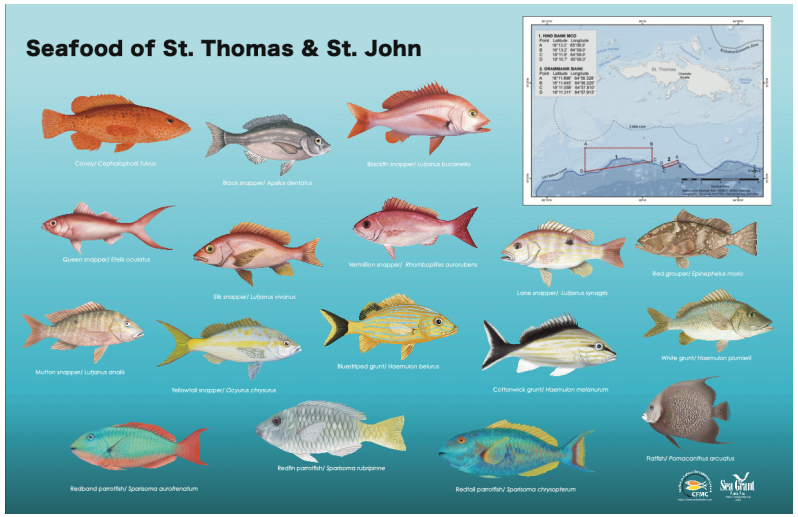
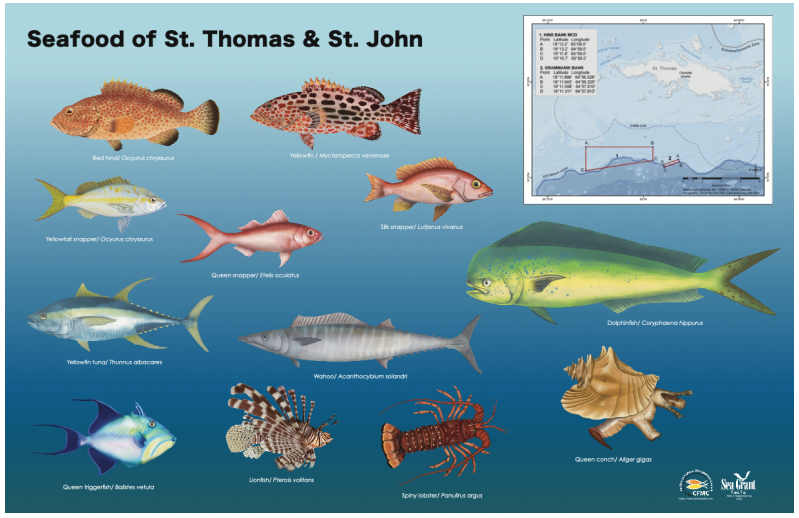
Outreach materials on MPAs in St. Thomas/St. John, USVI









O & E Initiatives proposed for 2022-2025

- **IBFMPs** – Fact sheets/Infographics for PR, St. Thomas/St. John and St. Croix
  - - Graciela García Moliner, María López (NOAA) will collaborate.
- **MPAS – February 9, 2022, MPA Symposium in San Juan, PR**
  - **Fact sheets/Infographics, short videos** on MPAs in the region and their impact on fisheries and their importance for fisheries sustainability. 2022 -2023
- **Illustrated Booklets**
  - Climate Change impacts on fisheries 2022
  - MPAs in the US Caribbean 2022
- **Fisheries Education in PR and USVI**
  - Need for new fishers in our region.
  - Council support for the Escuela de Pesca Project in Cabo Rojo, PR

All products will have a QR code to the CFMC webpage for the documents and other items.

Specific areas of action for Outreach and Education in 2020-2025

- Basic concepts of **Ecosystem Based Management** and their application to the management measures. The objective is to help fishers and consumers in general to understand the components of the marine ecosystem, the importance of the **Fishery Ecosystem Plan** for the marine fishery ecosystem and their responsibility in keeping it healthy and sustainable.
- **Island Based Fishery Management Plans (IBFMP) for Puerto Rico, St. Thomas/St. John and St. Croix**. The objective is for fishers and consumers to recognize the species being managed, their natural function in the marine ecosystem and the importance of management measures to keep the ecosystem healthy and the fishery resources sustainable.
- **Sustainable Fish and Seafood consumption** to educate consumers on the importance to consume these products and, at the same time be aware of the impact of removing those species from the ecosystem.
- **Marine Protected Areas in Puerto Rico, St. Thomas/St. John and St. Croix.** Their importance as instruments for the protection of fishes spawning aggregation and the regulations applied to these areas from territorial and federal government agencies.

Social Media

- Cristina Olán, presentation

Liaisons reports…

- Wilson Santiago – Puerto Rico
- Mavel Maldonado – St. Croix
- Nikole Greaux – St. Thomas/St. John


QUESTIONS?
THANK YOU


HAPPY NEW YEAR