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Subject: CFMC_EFH_Cooments

Comments on the EFH-EIS

Comments on the Draft Environmental Impact Statement for the Generic Essential Fish Habitat Amendment to ....(the FMP's) for the U.S. Caribbean. June 2003.

By: Richard S. Appeldoorn
Alfonso Aguilar
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AAN 1 The NOAA/NOS habitat maps include bedrock reefs as a classification. This type of reef is very common on the north shore of Puerto Rico and provides habitat for reef fish and lobster. In general, more emphasis should be given to this habitat as EFH in the document.

AAN 2 The NOAA/NOS habitat maps contain areas that are classified as unknown (example Figures 2.5-2.15). The legends in these figures should include the unknown category to show that there is no data for these areas (which constitutes the majority of the shelf in many places).

AAN 3 To protect EFH, there is a need to develop a standardized process that facilitates decision making at the regulating agencies to determine if habitat degradation has occurred or will occur. This is especially important for cumulative, indirect impacts, such as discharges of suspended sediments from storm water run-off that may impact coral reef habitats. An analogy might be the use of standards of bacterial concentrations by EPA to classify coastal waters for swimmers. Currently, many of the decisions regarding impacts are made subjectively.

AAN 4 Figure 2.29 "Aggregate Running Ripe Sites", shows the location of running ripe reef fish from the SEAMAP surveys. It is not clear whether there were other sampling stations without evidence of running ripe reef fish. Are the observed aggregations of points an artifact of increased sampling effort in some areas? (yes — the red hind spawning sites). This should be clarified.

AAN 5 P. 2-75 In the bottom paragraph the figure numbers do not correspond to the appropriate figures.

AAN 6 Section 3..2.11.4.1 Status of Stocks (reef fishes) The introductory paragraph only cites the Appeldoorn et al., SAFE report. Other studies have all shown overfishing. These include the following:

Acosta, A., R.S. Appeldoorn. 1992. Estimation of growth, mortality and yield per recruit for *Lutjanus synagris* (Linnaeus) in Puerto Rico. Bull. Mar. Sci. 50: 282-291.*

Appeldoorn, R.S., K.C. Lindeman. 1985. Multispecies assessment in coral reef fisheries using higher taxonomic categories as unit stocks, with an analysis of an artisanal haemulid fishery. Proc. Fifth Int. Coral Reef Congr. 5: 507-514.*

Appeldoorn, R.S., J.M. Posada. 1992. The effects of mesh size in Antillean fish traps on the catch of coral reef fish. Report to the Caribbean Fishery Management Council, Hato Rey, Puerto Rico.

Beets, J. and A. Friedlander. 1992. Stock analysis and management strategies for red hind, *Epinephelus guttatus,* in the U.S. Virgin Islands. Proc. Gulf Carib. Fish. Inst. 42: 66-79.

Beets, J. and A. Friedlander. 1999. Evaluation of a conservation strategy: a spawning aggregation closure for red hind, *Epinephelus guttatus,* in the U.S. Virgin Islands. Environmental Biology of Fishes 55: 91-98.

Colin, P.L. 1982. Aspects of the spawning of Western Atlantic reef fishes. Pp 69-78 *in* The biological bases for reef fishery management (G.R. Huntsman, W.R. Nicholson, W.W. Fox, Jr., eds.). NOAA Tech. Mem. NMFS-SEFC-80.

Dennis. G.D. 1988. Commercial catch length-frequency data as a tool for fisheries management with an application to the Puerto Rico trap fishery. Mem. Soc. Cien. Nat. La Salle 48(Supl. 3): 289-310.*

Olsen, D.A. and J.A. LaPlace. 1978. A study of a Virgin Islands grouper fishery based on a breeding aggregation. Proc. Gulf Caribb. Fish. Inst. 31: 130-144.

Stevenson, D.K. 1978. Management of a tropical pot fishery for maximum sustainable yield. Proc. Gulf Caribb. Fish. inst. 30: *95-115.**

Those followed by an * present some quantitative assessment, including YPR.

AAN 7 Section 3.2.11.4.2.3.Juvenile habitat

A detailed description is given of the use of urchin spines as settlement habitat for grunts. However, this is not necessarily the primary habitat, and this varies by species. Very little is given about ontogenetic migrations, which involve habitat shifts and may have spatial limits to these shifts, at least in an alongshore direction. No mention is given of the importance of mangroves. The following is a list of some of the species undergoing migrations from seagrass and mangroves to reefs. There are others that shift from inshore to offshore reef habitats (see references). For the table below, use of Mangrove habitats is limited to those located on emergent reefs or the outer fringe of mainland mangroves. For both mangrove and seagrass habitats, water is assumed to be clear and salinity is near that of seawater.

Reef fishes showing ontogenetic migration from inshore seagrass (Sg) and mangrove (Mg) habitats to reefs (R). Ch = Channel, sh = shallow.

Species	Common Name	Settlement/ Junvenile Habitat	Adult Habitat	Juvenile Habitat Dependency?	Reference
Acanthurus bahianus	surgeonfish	sh R/Sg	R		8,13
Acanthurus chirurgus	doctorfish	Mg/Sg	R	Opportunistic Mg/Sg	1,6,8,9,10,13
Chaetodon capistratus	four-eye butterflyfish	Mg	R	Not Mg	1,9,10,13
Epinephelus striatus	Nassau grouper	sh Algae	R		3
Gerres cinereus	yellowfisn mojarra	Mg	Mg/Ch/R	Possible Mg	9,13
Haemulon flavolineatum	French grunt	Sg/Mg/R	R	Opportunistic Sg/Mg	1,5,6,7,8,9,10,11,13
Haemulon parra	sailors choice	Mg	R	Opportunistic	5,10
Haemulon plumieri	while grunt	Sg (Mg?)	R	Opportunistic	4,5,6,9,11,13
Haemulon sciurus	bluestriped grunt	Sg to Mg	R	Sg/Mg	5,6,7,9,10,11,13
Lutjanus analis	mutton snapper	Mg/Sg	R	Possible Sg/Mg	5,9,11,13
Lutjanus apodus	schoolmaster	Mg/Sg	R	Probable Mg/Sg	1,2,5,6,8,9,10,11,13
Lutjanus griseus	gray snapper	Mg/Ch	R	Possible Mg/Sg	1,5,8,9,10,11,13
Lutjanus jocu	dog snapper	Mg	R	Possible Mg/Sg	5,11
Lutjanus mahogoni	mahogany snapper	Mg/sh R	R		5,9,10,11,13
Lutjanus synagris	lane snapper		R	Estuarine Opportunistic	5
Ocyurus chrysurus	yellowtail snapper	Mg,Sg,Ch	R	Mg/Sg	5,6,8,9,10,11,12,13
Scarus coeruleus	blue parrotfish	Sg/Ch	R	Possible Sg	9
Scarus guacamaia	rainbow parrotfish	Mg	R	Possible Mg	9,10,13
Scarus iserti	striped parrotfish	Sg/Ch	R		8,9,10,13
Scarus taeniopterus	princess parrotfish	Mg/Sg	R		8
Sparisoma rubripinne/chrysopterum	yellowtail/redtail parrotfish	Mg/Ch	Ch/R	Not Mg/Sg	6,9,10,13
Sparisoma viride	stolight parrotfish	some Mg	R		13
Sphyraena barracuda	great barracuda	Mg	R	Possible Mg	1,6,9,10,13

Literature Source:

1 Dennis 1992
2 Rooker 1995
3 Eggleston 1995
4 Appeldoorn et al. 1996
5 Lindeman 1997
6 Murphy 2001
7 Recksiek et al. 2001
8 Cocheret et al. 2002
9 Nagelkerken et al. 2002
10 Nagelkerken and van der Velde 2002
11 Appeldoorn et al. 2003
12 Christensen et al. 2003
13 Nagelkerken and van der Velde 2003

Appeldoorn, R.S., C.W. Recksiek, R.L. Hill, F.E. Pagan, G.D. Dennis. 1997. Marine protected areas and reef fish movements: the role of habitat in controlling ontogenetic migration. Proc. 8th Int. Coral Reef Symp. 2:1917-1922.

Appeldoorn, R.S., A. Friedlander, J. Sladek Nowlis, P.Ussegilo, A.Mitchell-Chui. 2003. Habitat connectivity in reef fish communities and marine reserve design in Old Providence – Santa Catalina, Colombia. Gulf Caribb. Res. 14: 61-77.

Christensen, J.D., C.F.G. Jeffrey, C. Caldow, M.E. Monaco, M.S. Kendall, R.S. Appeldoorn. 2003. Quantifying habitat utilization patterns of reef fishes along a cross-shelf gradient in southwestern Puerto Rico. Gulf Caribb. Res. 14: 9-27.

Cocheret de la Moriniere E, B.J.A. Pollux, I. Nagelkerken, G. van der Velde. 2002. Post-settlement life cycle migration patterns and habitat preference of coral reef fish that use seagrass and mangrove habitats as nurseries. Estuar. Coast. Shelf Sci. 55: 309–321.

Dennis, G.D. 1992. Resource utilization by members of a guild of benthic feeding coral reef fish. Ph.D. thesis. University of Puerto Rico, Mayaguez, Puerto Rico. 224 p.

Eggleston DB 1995. Recruitment in Nassau grouper *Epinephelus striatus:* post-settlement abundance, microhabitat features, and ontogenetic habitat shifts. Mar Ecol Prog Ser 124: 9-22

Lindeman, K.C. 1997. Development and cross-shelf habitat use of haemulids and lutjanids: effects of differing shoreline management policies. Ph.D. thesis. University of Miami, Miami, FL. 420 p.

Murphy, B.R. 2001. Comparison of fish communities within mangrove, seagrass, and shallow coral reef habitats in southwestern Puerto Rico using a cross-shelf habitat classification system. M.S. Thesis. University of Rhode Island. Kingston, RI. 151 pp.

Nagelkerken, I., C.M. Roberts, G. van der Velde, M. Dorenbosch, M.C. van Riel, E. Cocheret de la Moriniere, P.H. Nienhuis. 2002. How important are mangroves and seagrass beds for coral-reef fish? The nursery hypothesis tested on an island scale. Mar. Ecol. Prog. Ser. 244: 299–305.

Nagelkerkenl, I., G van der Velde . 2002 Do non-estuarine mangroves harbour higher densities of juvenile fish than adjacent shallow-water and coral reef habitats in Curacao (Netherlands Antilles)? Mar. Ecol. Prog. Ser. 245: 191–204,

Nagelkerkenl, I., G. van der Velde. 2003. Connectivity between coastal habitats of two oceanic Caribbean islands as inferred from ontogenetic shifts by coral reef fishes. Gulf Caribb. Res. 14: 43-59.

Nagelkerkenl, I., G. van der Velde. 2002. Do non-estuarine mangroves harbour higher densities of juvenile fish than adjacent shallow-water and coral reef habitats in Curacao (Netherlands Antilles)? Mar. Ecol. Prog. Ser. 245: 191–204.

Recksiek, C.W., B.R. Murphy, R.S. Appeldoorn, K.E. Lindeman. 2001. Integrating fish fauna and habitat assessments: a fundamental step in

developing fishery reserve design criteria. Proc. Gulf Caribb. Fish. Inst. 51: 654-666.

Rooker, J.R. 1995. Feeding ecology of the schoolmaster, snapper *Lutjanus apodus* (Walbaum), from southwestern Puerto Rico. Bull. Mar. Sci. 56: 881-894.

AAN 8

P. 3-82 and 3-118. Reference for Scharer et al. 2002 is missing from references. (see below)

Scharer, M., M. Prada, R. Appeldoorn, R. Hill, P. Sheridan, M. Valdes Pizzini. In press. The use of fish traps in Puerto Rico: current practice, long-term changes, and fishers' perceptions. Proc. Gulf. Caribb. Fish. Inst. 55.