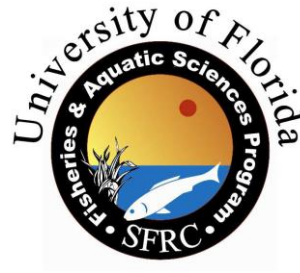
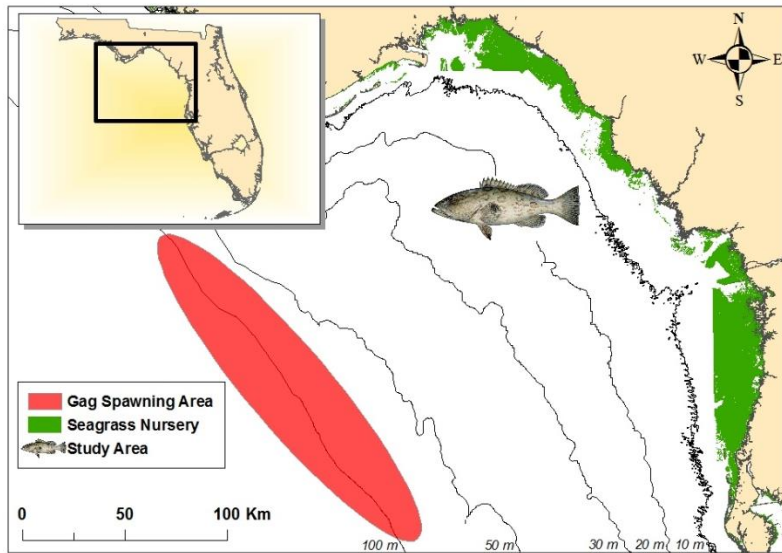


Restoring and Enhancing Life History Habitats Through Large Area Permitting



Gag Habitat Quality & Spatially Structured Life History



Lindberg et al. 2006. *Ecol. Appl.* 16:731-746
Biesinger et al. 2011. *Ecol. Modeling* 222:1448-1455
Biesinger et al. 2013. *JEMBE* 443:1-11



Video credit: L. Kellogg ca. 2000

Application of Habitat Selection Theory

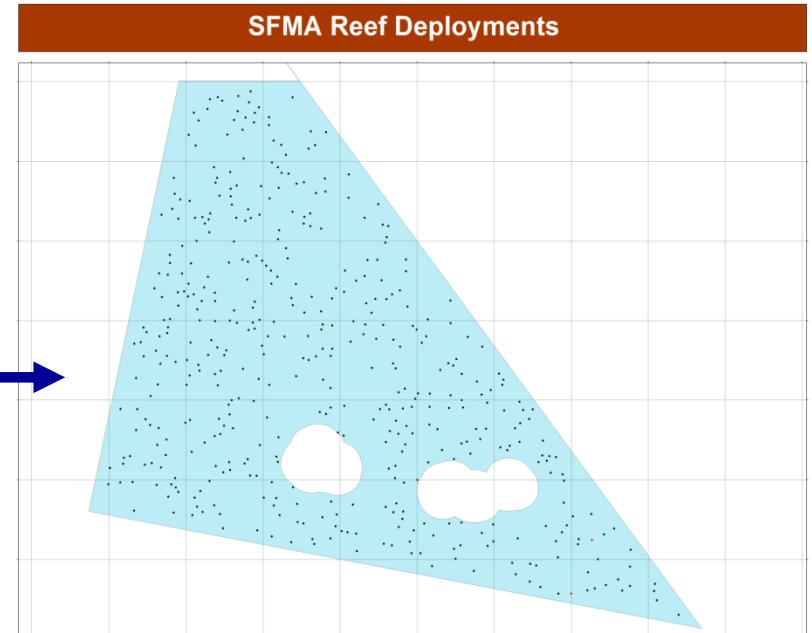
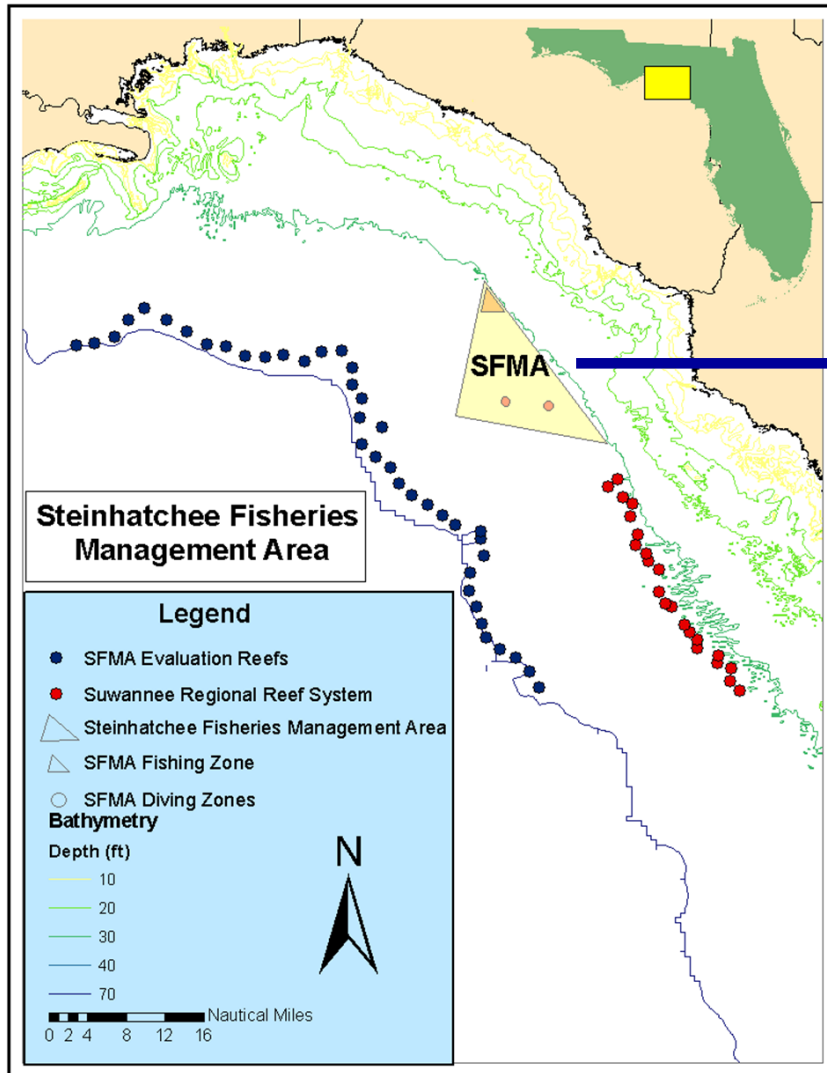
- Ideal Free Distribution, **IFD** (Fretwell & Lucas 1970, Fretwell 1972)
- Density-Dependent Habitat Selection, **DDHS** (Rosenzweig 1981, 1985)
- Ontogenetic Habitat Shifts, **μ/g** (Werner & Gilliam 1984)
- Spatial Scaling in Ecology (Wiens 1989)
- Basin Model of Dynamic Geography (MacCall 1990)
- Foraging Arena Theory (Walters & Juanes 1993, Walters & Korman 1999)
- Life History Bottlenecks (Caddy 2007, 2011, 2013)

Habitat selection (μ/g) affects growth, survival and reproduction.



Gag, *Mycteroperca microlepis*

Steinhatchee Fisheries Management Area

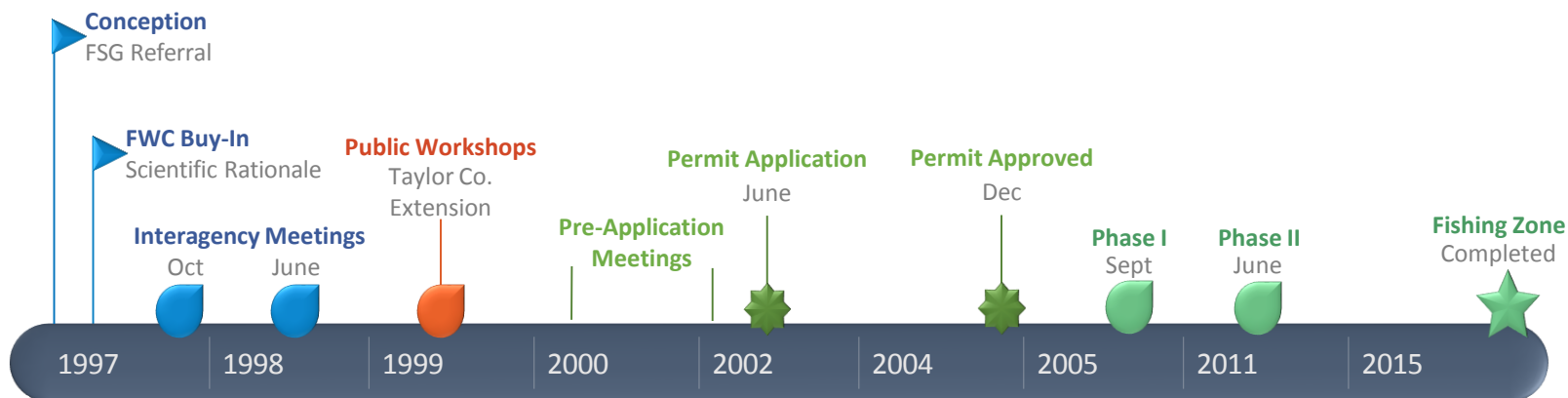


500 Standardized 4-cube patch reefs



Photo Credits: Keith Mille (FWC)

SFMA Project Milestones



Agencies FWC, DCA-CZM, USACOE, NOAA-NOS, USCG, FDEP

NOAA-NOS Charting Issue Fall 1999 – Spring 2002

Phase I Construction 40 standardized Monitoring Reefs

Phase II Construction 500 Conservation Reefs



Gag, Mycteroperca microlepis

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