

Golden Crab: Overview of Biology/Life History & Data for Assessments



Prepared by
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(some of the material is taken directly
from SAFMC documents, Harper et al. 2000), 2004 NMFS
SAFE Report, 1999 SAFMC SAFE Report, & analyses by Kate
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Range & Habitat

- **Geographic range:** The golden crab, *Chaceon fenneri*, is a large gold or buff colored species inhabiting the continental slope of Bermuda and the southeastern United States from off Chesapeake Bay south through the Straits of Florida and into the eastern Gulf of Mexico. Prior to its description previous records referred to this species as either the red crab, *C. quinquedens*, or the similar gold colored *C. affinis* which is endemic to the northeast Atlantic Ocean. Its recognition as a new species was a direct result of exploratory fishing in the eastern Gulf of Mexico in hopes of establishing a new deep-sea crab fishery in this area.
- **Habitat:** Reported depth distributions range from 205 m off the Dry Tortugas to 1,007 m off Bermuda.

Life History

- **Life span:** Long-lived; probably over 30 years.
- **Food:** Feeding habits are very poorly known; categorized as scavengers that feed on dead carcasses.
- **Growth rate:** unknown for golden crab but growth in deep-sea crustaceans is generally quite slow. Size of males examined range from 34 to 139 mm carapace length CL and females range from 39 to 118 mm CL. No discernible molting pattern was observed for males. Conversely, female crabs showed 2 periods of molting: August and October. The commercial fishery harvests males starting at 130 mm CW suggesting they are 16 years old.
- **Maximum size:** Larger males exceeding 170mm CW may well be over 30 years of age.
- **Migrations:** Some evidence of size distribution by depth (larger males in deeper water. Fishermen report seasonal movement from deeper to shallower water.
- **Predators:** None known.

Spawning

- **Reaches reproductive maturity:** Between 85 & 100 mm CW. In the South Atlantic Bight females are mature at 97 mm CW. In South Africa, the red crab matures at 7-9 years and 75-90 mm CW.
- **Reproduction:** Annual reproductive cycle with a single batch of eggs produced each year.
- **Spawning season:** Ovigerous females have been reported during September, October and November and range in size from 91 to 118 mm CL.
- **Spawning grounds:** Spawn from the South Atlantic Bight through southern Florida and into the Gulf of Mexico.

Stock Structure

- The management unit is the population of golden crab occurring within the South Atlantic Council area of jurisdiction along the U.S. Atlantic coast from the east coast of Florida including the Atlantic side of the Keys to the North Carolina/Virginia border. Red crab and Jonah crab are included in the fishery but not in the management unit because regulations in this plan only address golden crab at this time. Although all three species of crab are also harvested in the Gulf of Mexico and Mid-Atlantic/New England waters the Council concluded the populations are sufficiently separated from one another to be managed separately.

Data Available

- Landings from 1995 onwards; confidential by zone.
- Assessment of the Golden Crab Fishery off south Florida – Harper et al. (2000); included as Attachment 3.
- Average size & CPUE over time.
- SEDAR Assessment planned for 2015?

Number Active Permits & Vessels Landing 1995-2007

Table 1. Numbers of active permit holders and vessels landing golden crab, 1995-2007.
Source: SEFSC, 2008.

Year	Permit Holders	Vessels Making Landings
1996	34	4
1997	35	14
1998	29	14
1999	11	8
2000	10	10
2001	8	6
2002	12	7
2003	14	6
2004	12	5
2005	11	5
2006	12	6
2007	11	6

Landings by Zone 1995-2007

Table 3. Landings of golden crab by Zone, 1995-2007.

Source: SEFSC, 2008.

Year	Northern Zone	Middle Zone	Southern Zone	Total
1995	0	confidential	confidential	61,660
1996	0	523,160	0	523,160
1997	0	661,896	372,551	1,034,447
1998	0	361,480	156,836	518,316
1999	0	confidential	confidential	682,224
2000	0	584,130	257,617	841,747
2001	0	confidential	confidential	781,138
2002	0	confidential	confidential	500,774
2003	0	confidential	confidential	359,087
2004	0	confidential	confidential	278,336
2005	0	432,846	0	432,846
2006	confidential	566,780	confidential	599,374
2007	confidential	confidential	0	502,292

Landings by Zone 1995-2007

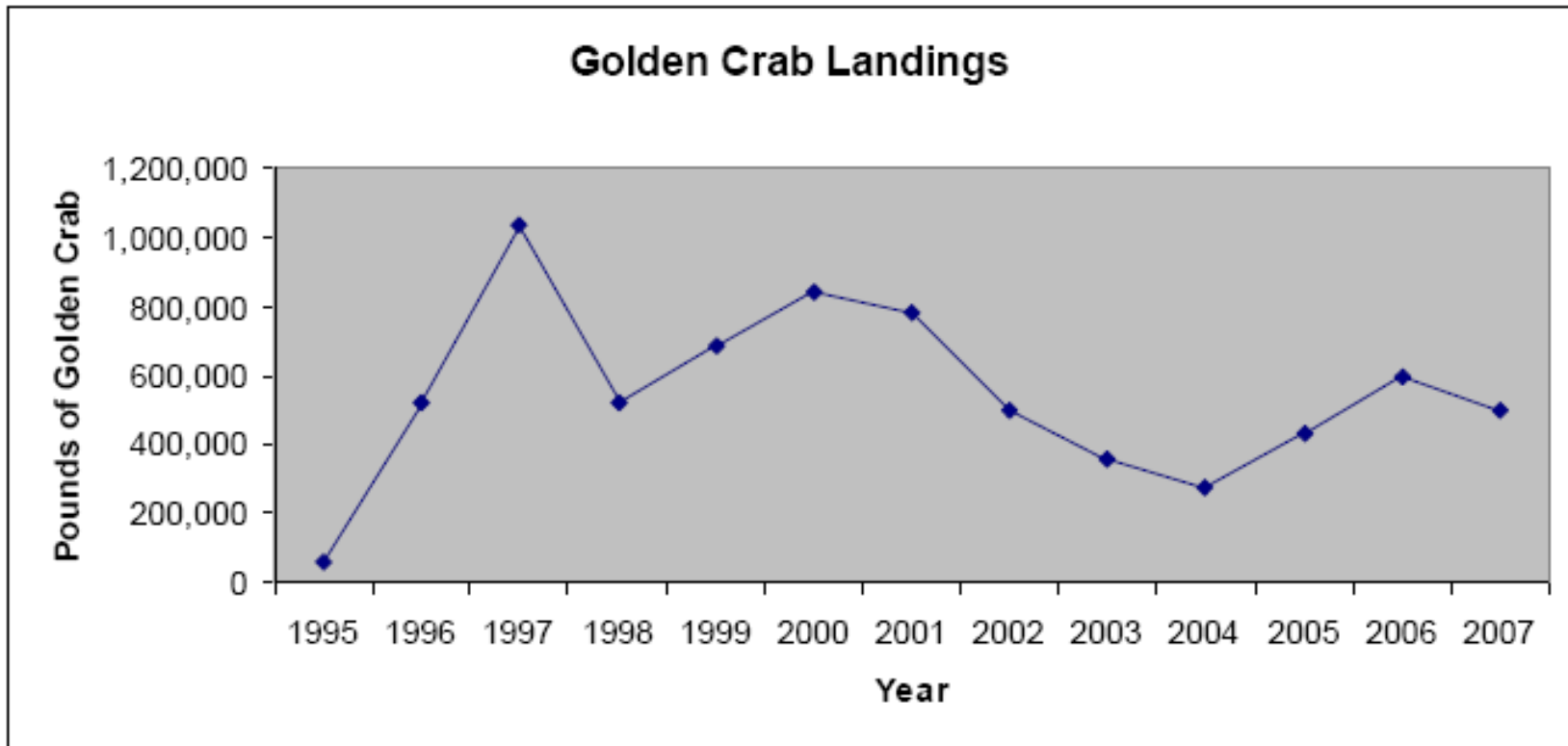


Figure 1. Landings of Golden Crab, 1995-2007.
Source: SEFSC 2008.

Monthly Landings 2003-2007

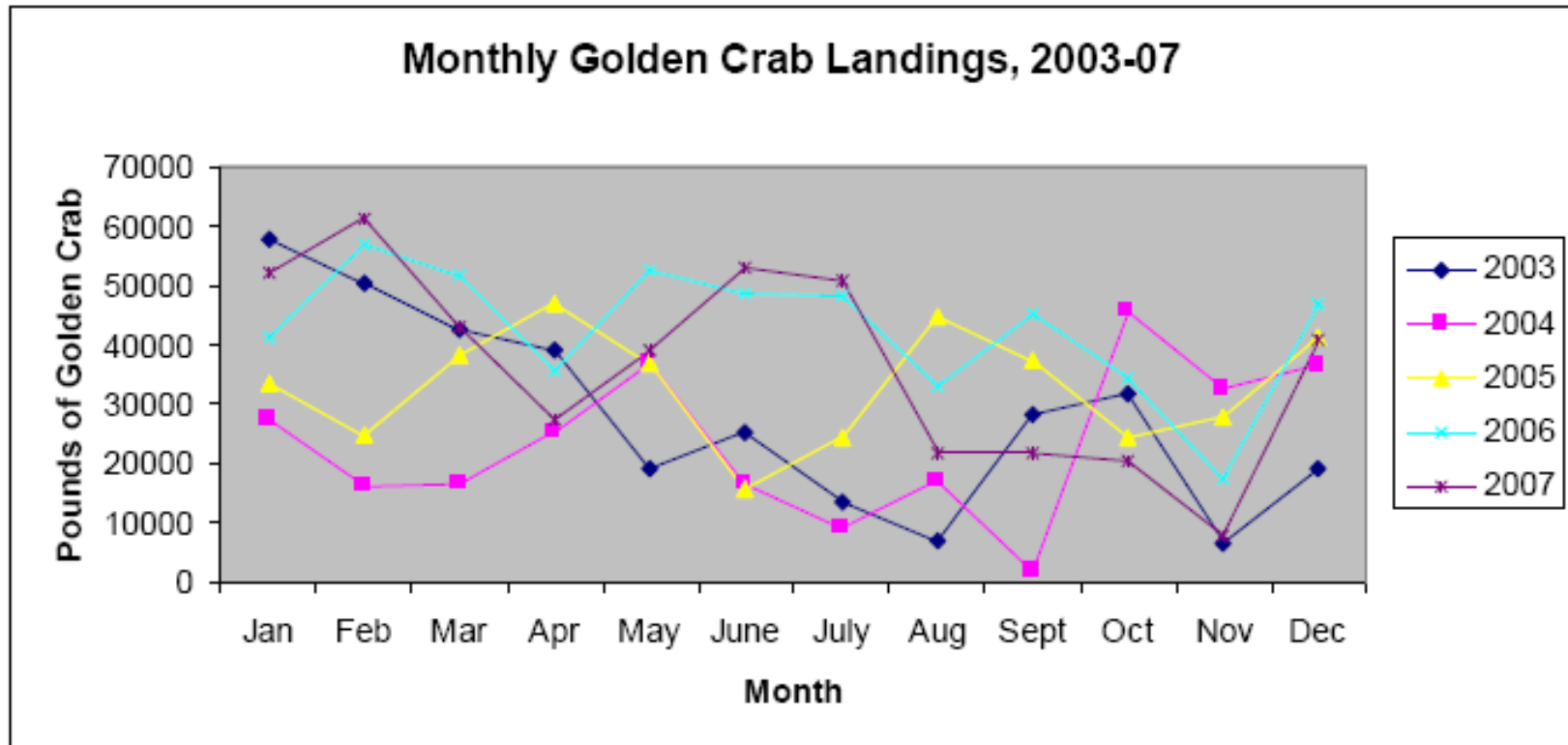


Figure 2. Monthly golden crab landings, 2003-2007.
Source: ALS data.

Average Size

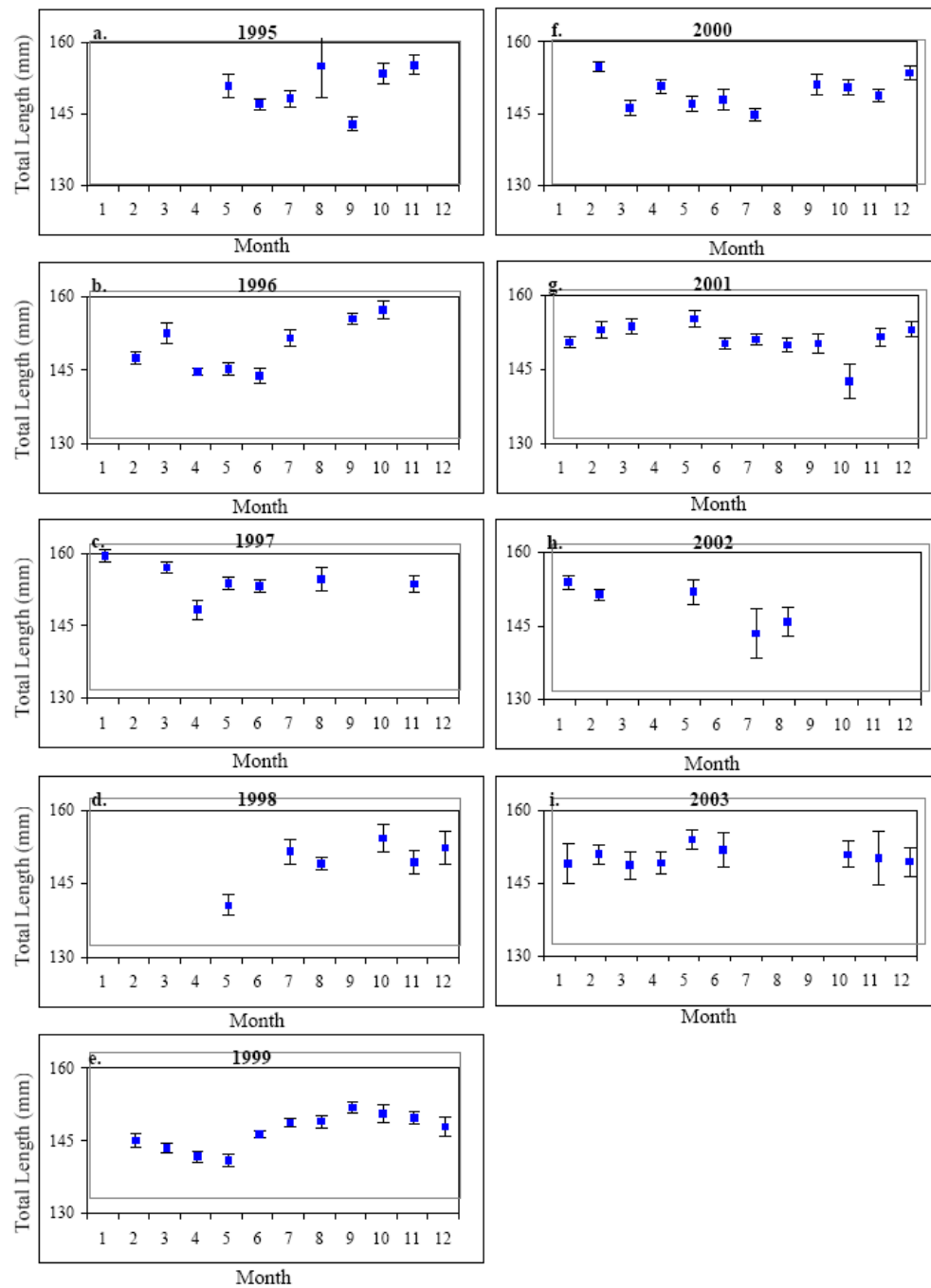


Figure 5: Mean monthly size of golden crab by year, with 95% C.I.

Average Size

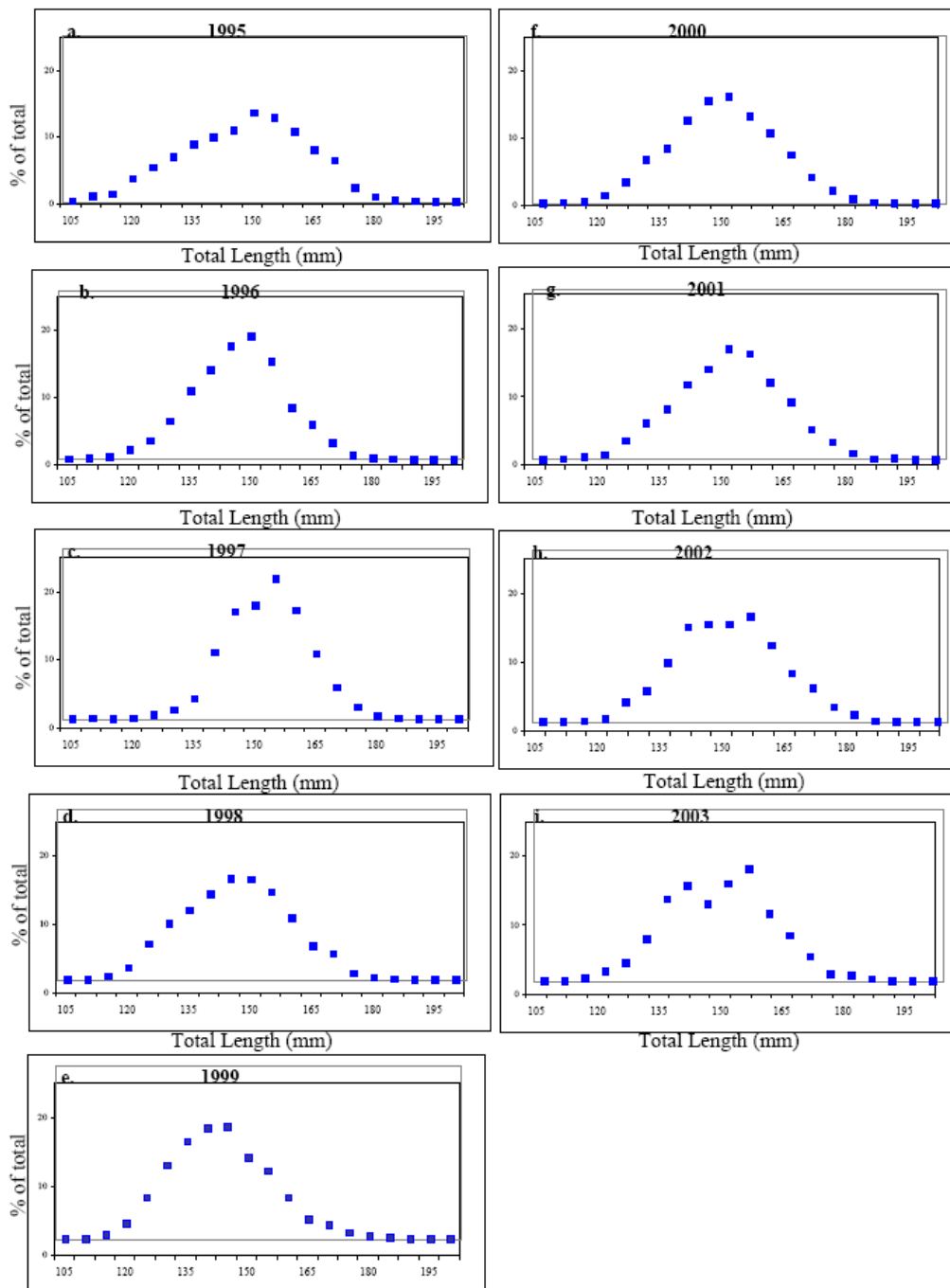
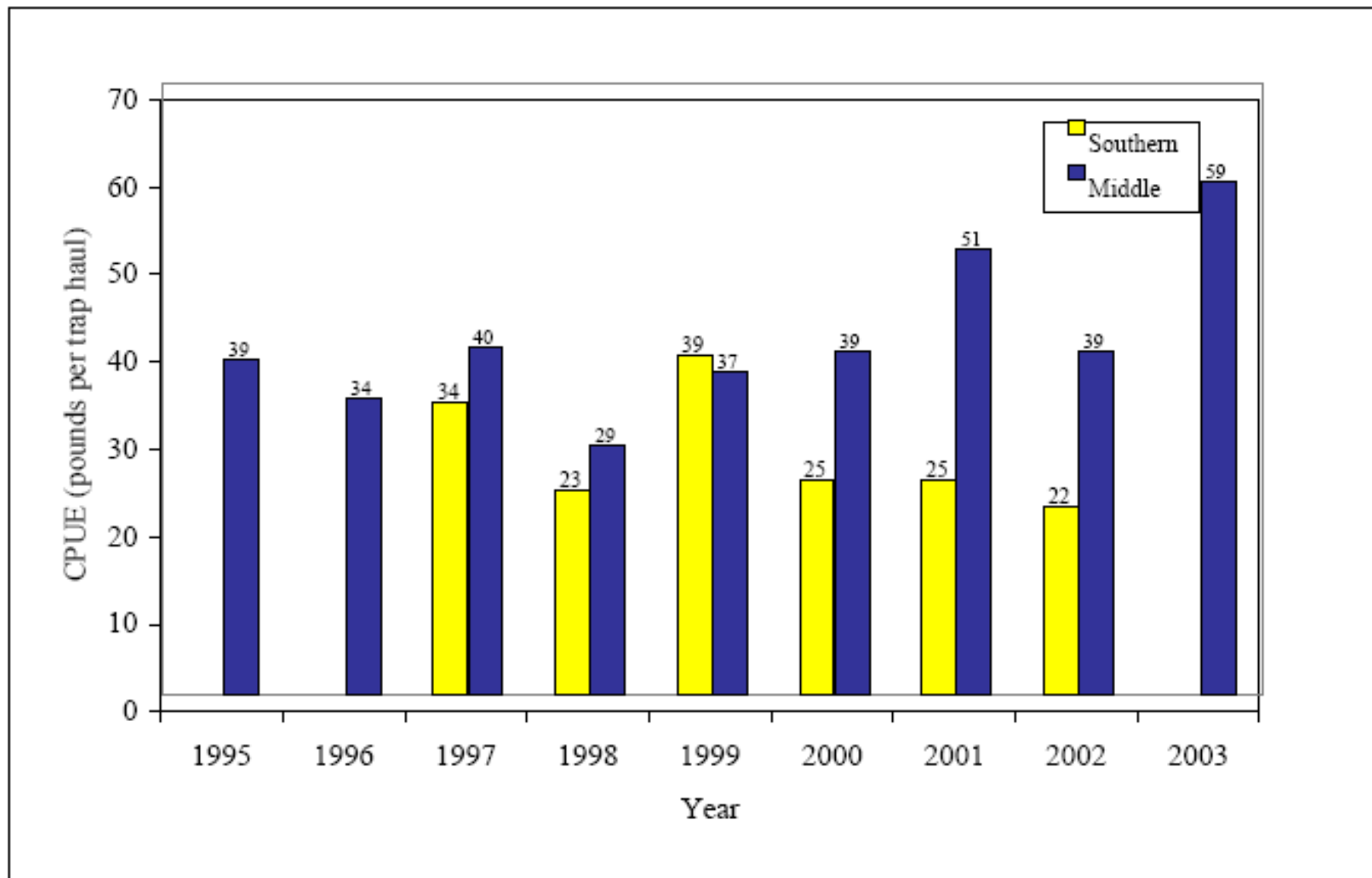
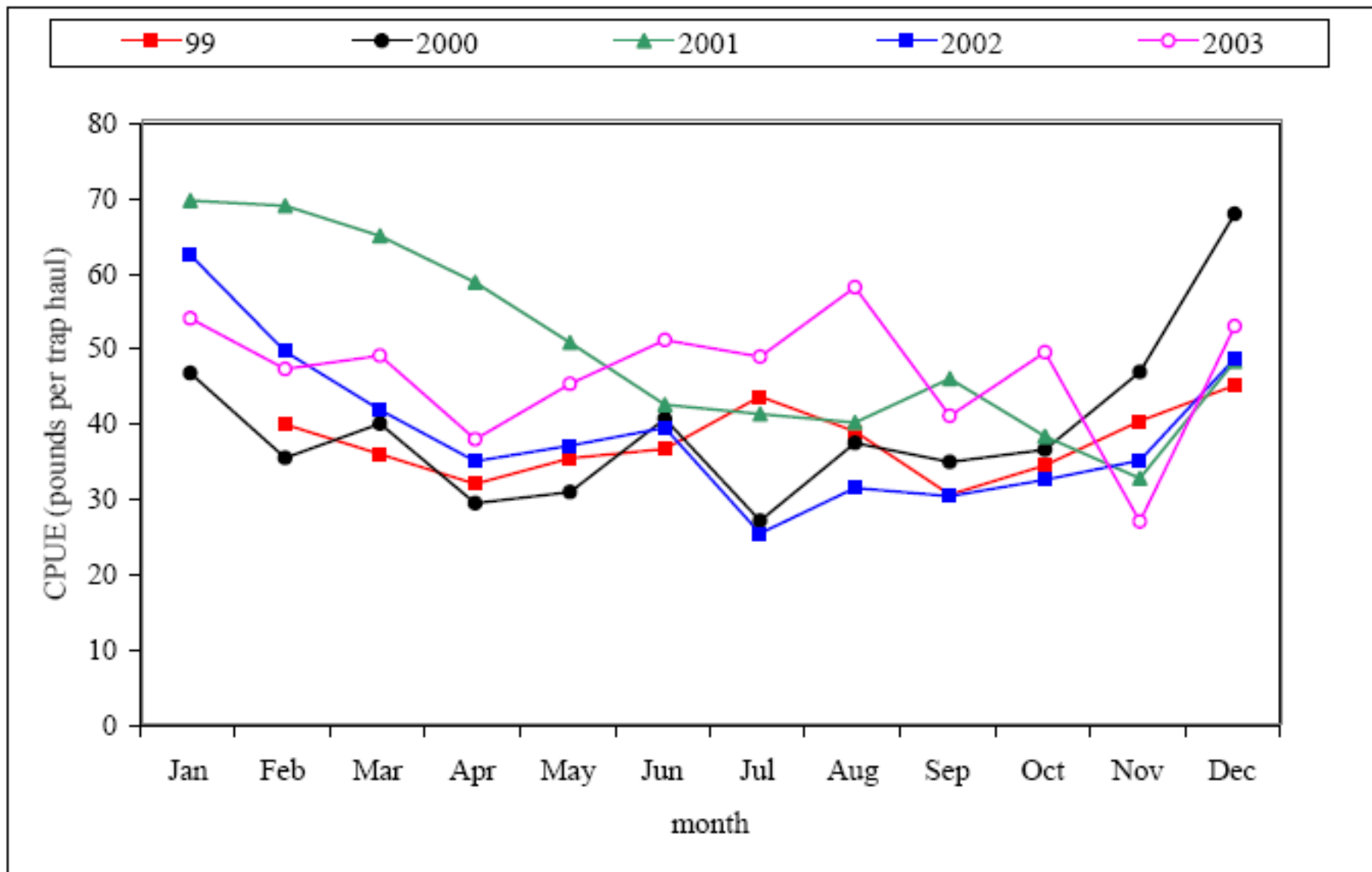


Figure 6: Length frequency of golden crabs measured in the TIP survey, 1995-2003.

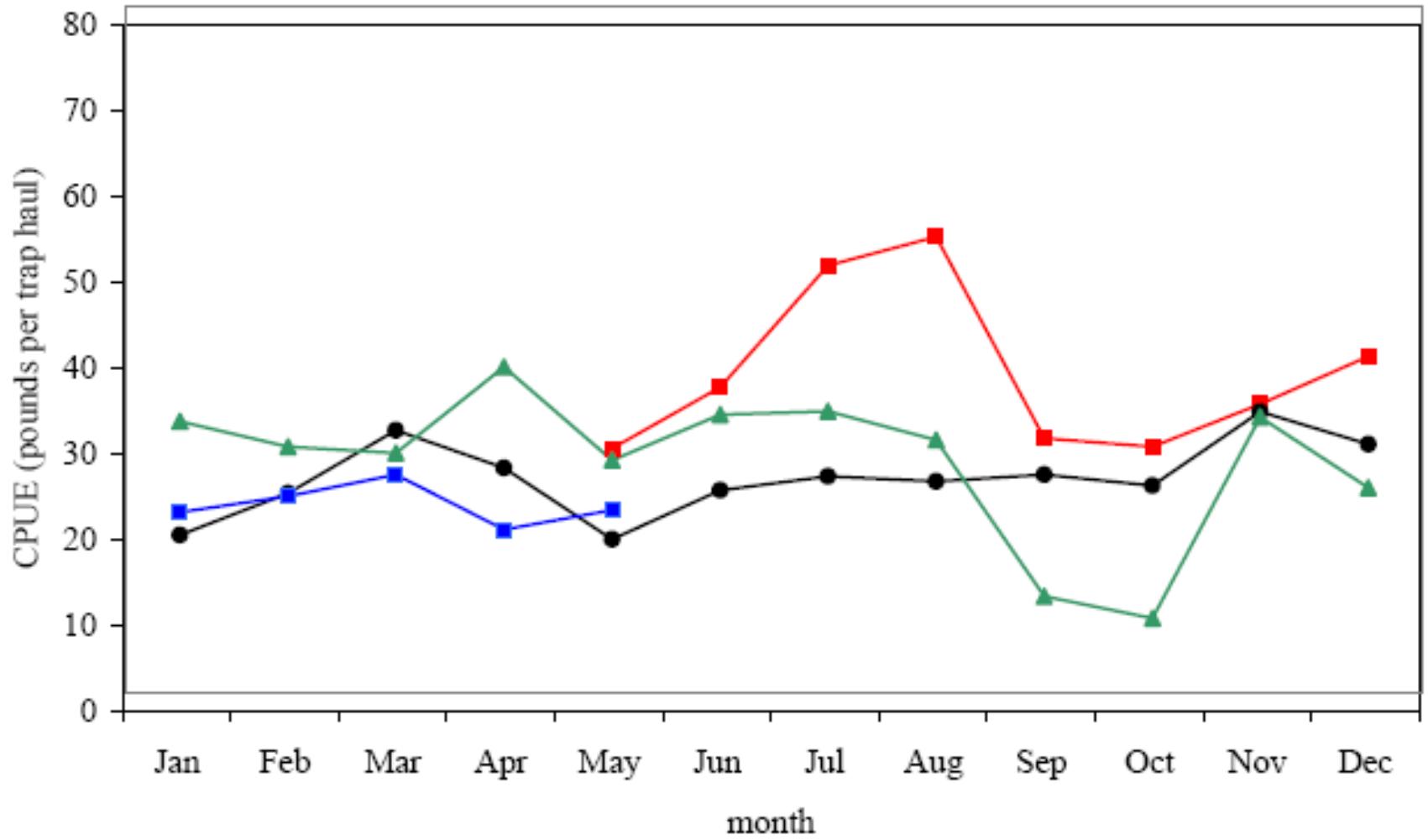
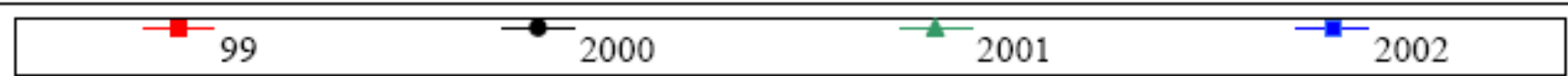
Pounds Per Trap



Monthly Pounds Per Trap – Middle Zone



Monthly Pounds Per Trap – Southern Zone



Stock Assessment – 2000

Harper et al. (2000) - Attachment 3

- Overall mean CW = 146.4 (138.1 – 157.7 mm)
- Catch & Effort used in Production Model; middle & southern zones only.
- Current biomass (in the middle & southern zones) (based on quarter data) is estimated to be slightly below B_{MSY} after having increased from lower levels in the recent past.
- Current fishing mortality (middle & southern zone) is at about F_{MSY} .

Potential MSY/OFL/ABC Values (temporary until SEDAR assmt in 2013)

- Maximum Sustainable Yield (MSY)
 - 5.0 MP (supported by Advisory Panel)
 - 2.5 MP (SEFSC letter dated 9/12/01)
 - 0.4-0.6 MP (avg. landings various years 1995-2007) and only cover middle & southern zones
- Overfishing Level (OFL)
 - $OFL = F_{MSY} = 0.7047$ (annual data; Harper et al.)
 - $OFL = F_{MSY} = 0.2055$ (quarterly data; Harper et al.)
- Allowable Biological Catch (ABC)
 - $ABC = 2.0$ MP (500,000 lb < 2.5 MP MSY, NMFS)
 - $ABC = 1.5$ MP (1,000,000 lb < 2.5 MP MSY, NMFS)