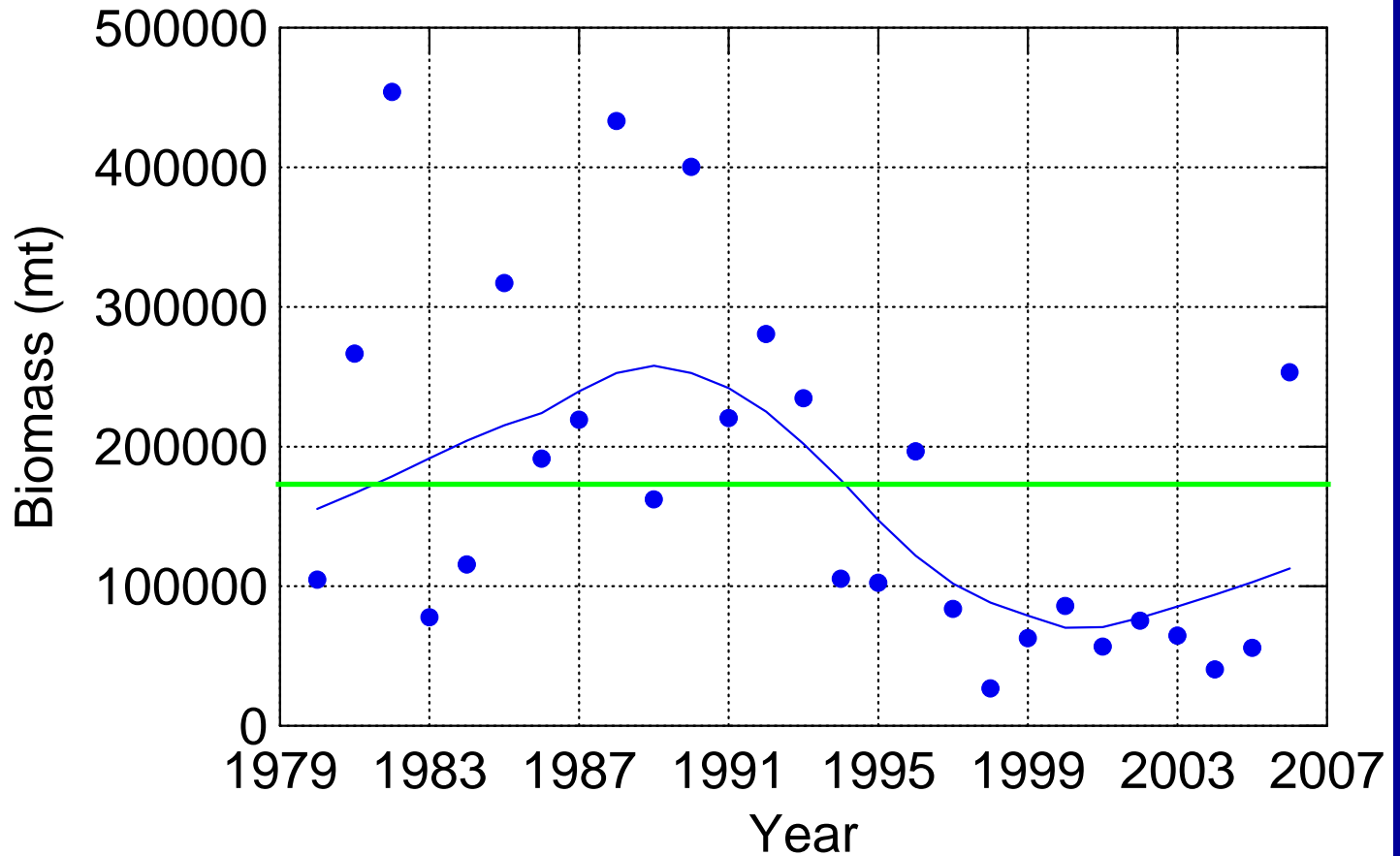


# Spiny Dogfish

- Stock status update
- Commercial quota and trip limit recommendations for FY2009
- Other management issues, as needed

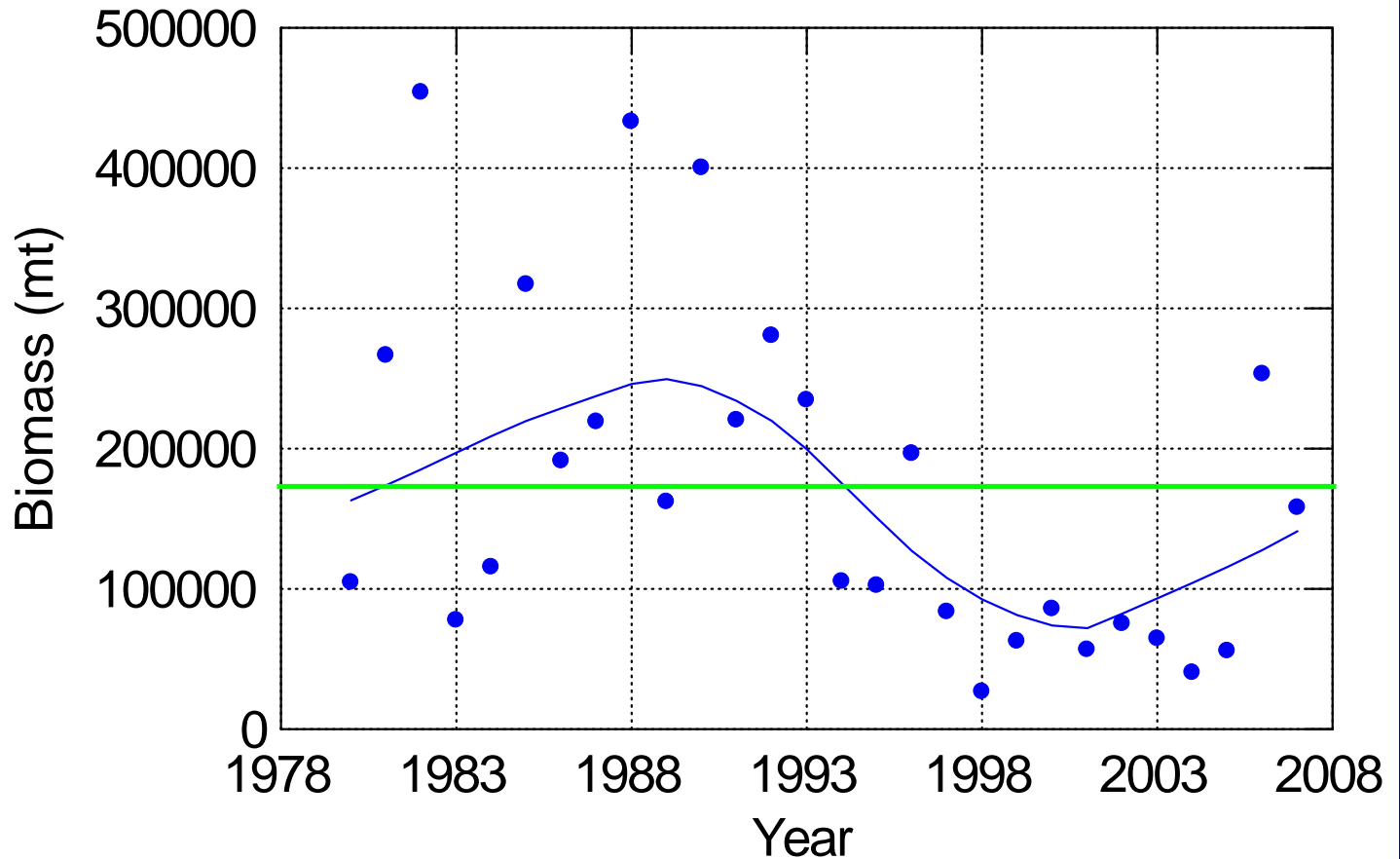
# Spring Survey 2006

Female Spawning Stock ( $\geq 80$  cm) (mt)



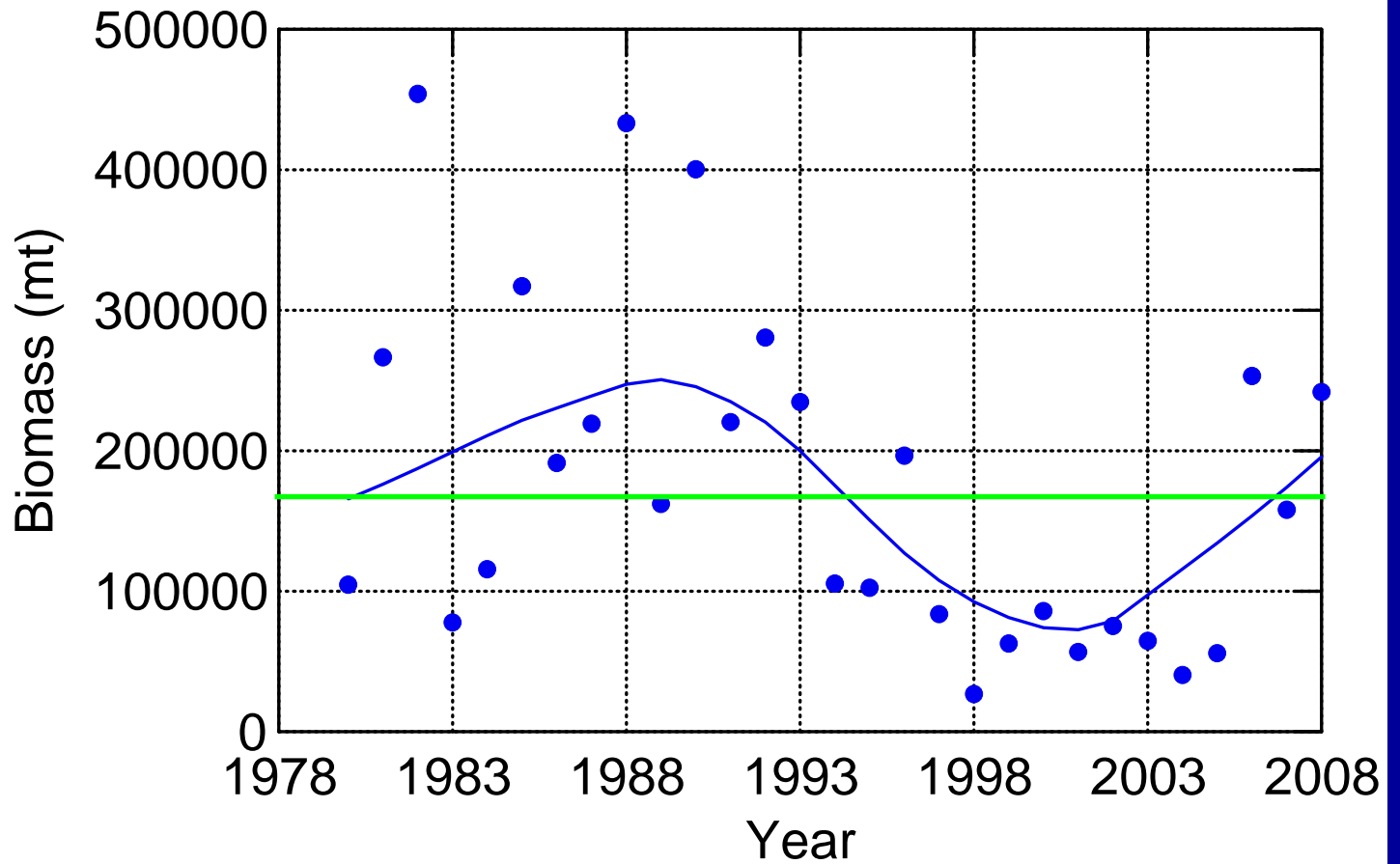
# Spring Survey 2007

Female Spawning Stock ( $\geq 80$  cm) (mt)



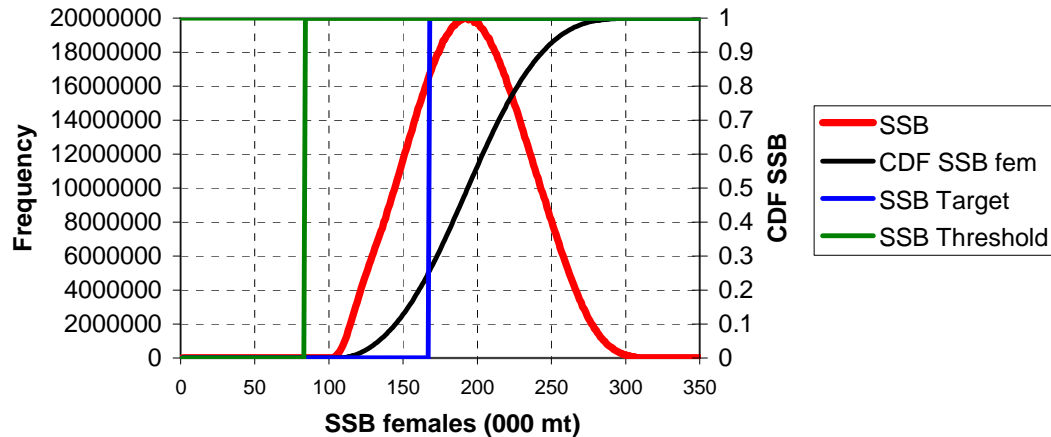
# Spring Survey 2008

Female Spawning Stock ( $\geq 80$  cm) (mt)

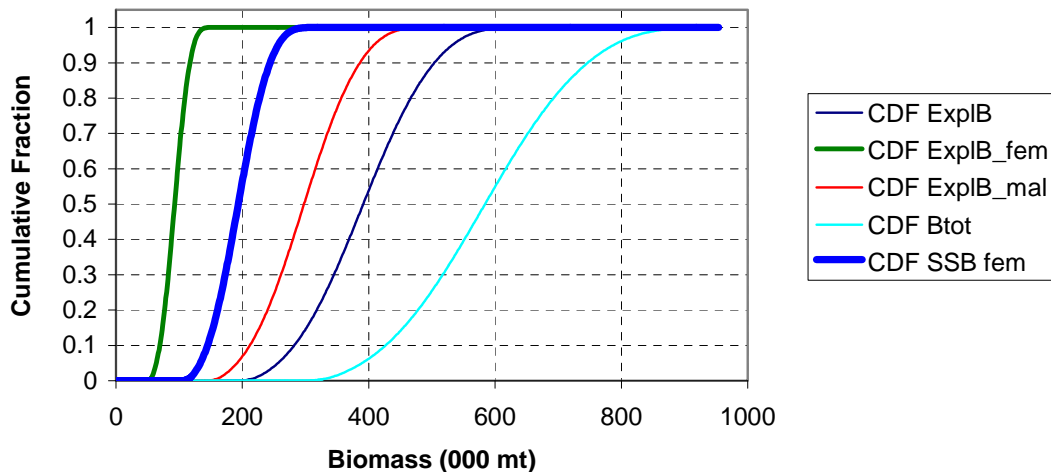


# Stochastic estimator of SSB

Stochastic Estimate of Spawning Stock Biomass with nominal target and threshold biomasses, 2007

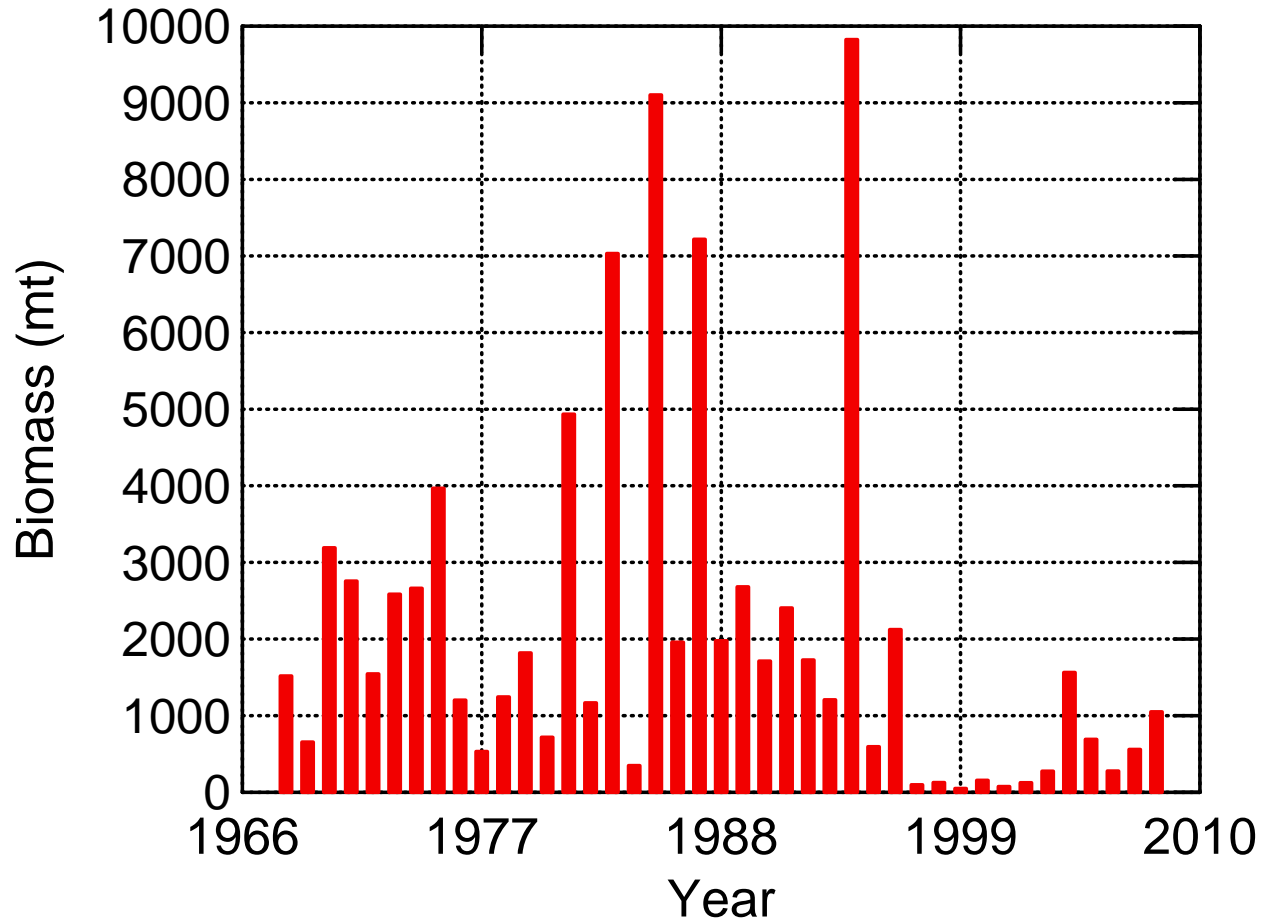


Stochastic Estimates of Swept Area Biomass, 2007



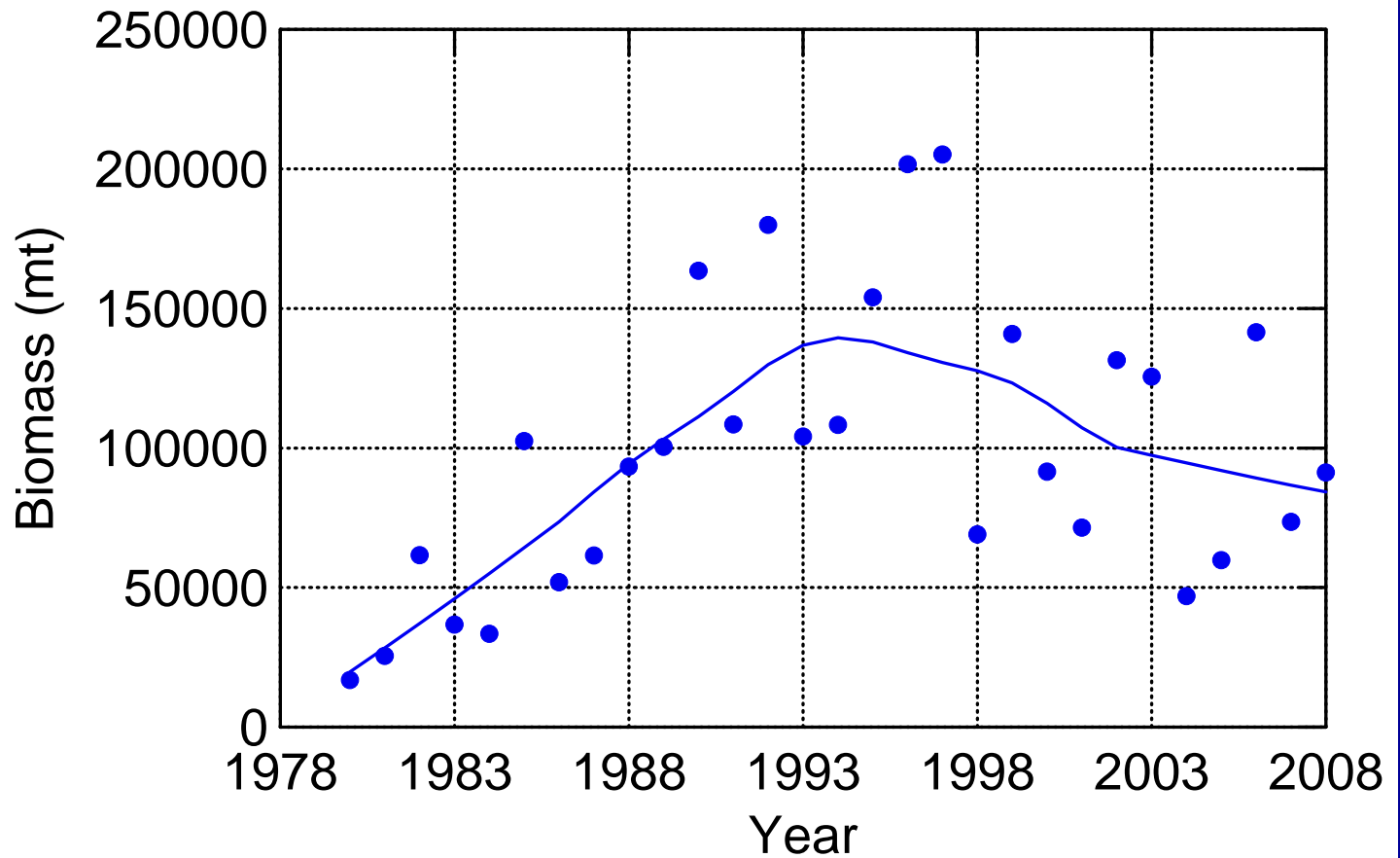
# Survey Catch of Pups (< 36cm)

nt

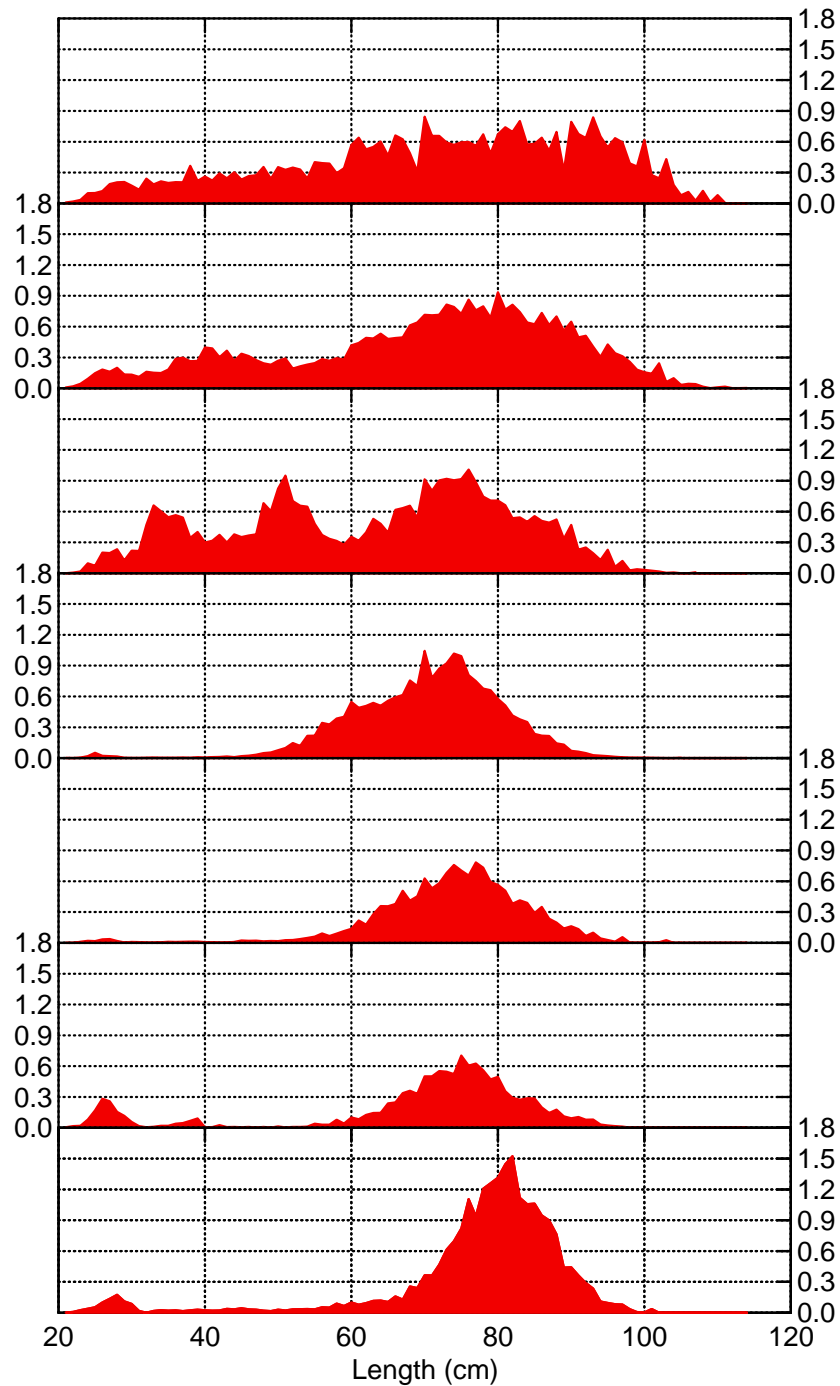


# Biomass Trends

Immature Female Stock (36-79 cm) (mt)



# Female Size Composition



1988-90

1991-93

1994-96

1997-99

2000-02

2003-05

2006-08



# Stochastic estimator of SSB

- SSB (2008) 194,616 mt  
(213,000 mt)
- SSB (threshold) 83,900 mt
- SSB (target) 167,800 mt  
(200,000 mt)

# Stock Status

|                    |           |
|--------------------|-----------|
| <b>Overfished:</b> | <b>NO</b> |
| Overfishing:       | NO        |

## Rationale:

**Female biomass estimate ~ 194 kmt >  $B_{\text{threshold}} = 83.9$  kmt**

and

$F_{\text{Target}} = 0.11 = F_{2005} \sim 0.11 < F_{\text{Threshold}} = 0.20$

# Landings and Discards 2007

- U.S. comm landings
  - 3,524 mt    7.769 million lb
- Canadian comm landings
  - 2,328 mt    5.132 million lb
- Discards
  - 5,611 mt    12.371 million lb
- Rec Removals
  - 898 mt    1.979 million lb

# Landings and Discards 2007

| Gear (fraction dead)              | Discard (mt)  | Dead Discards (mt) | Landings (mt) |
|-----------------------------------|---------------|--------------------|---------------|
| Otter Trawl (0.5)                 | 8,115         | 4,058              | 13%           |
| Sink gill net (0.30)              | 5,133         | 1,540              | 66%           |
| Line Trawl + Scallop Dredge (0.1) | 133.8         | 13.4               | 20%           |
| Recreational Discards (0.2)       | 4,303.5       | 860.7              |               |
| Recreational Landings             |               |                    | 37.1          |
| US Landings                       |               |                    | 3,524         |
| Canadian Landings                 |               |                    | 2,328         |
| <b>TOTAL (mt)</b>                 | <b>17,685</b> | <b>6,247</b>       | <b>5,889</b>  |

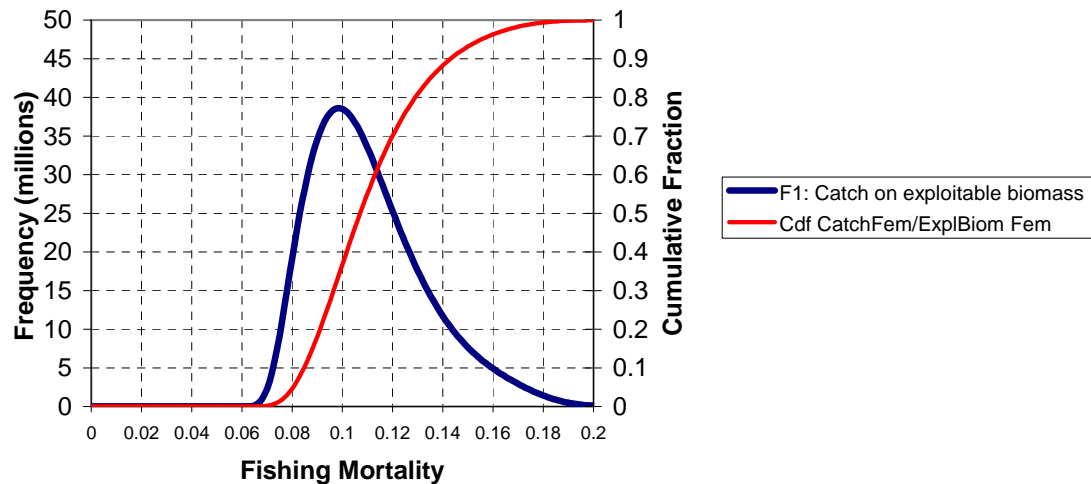


# Landings and Discards 2007

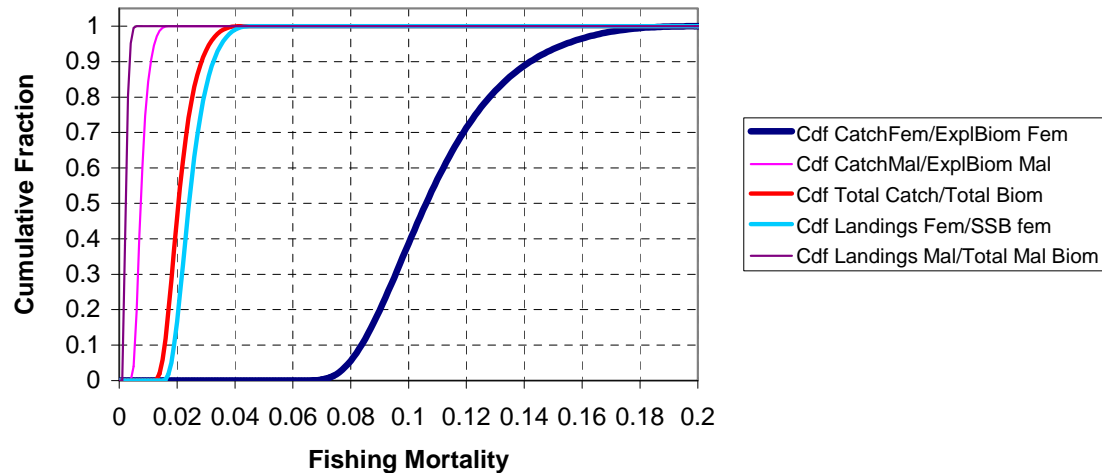
- U.S. comm landings
    - 3,524 mt    7.769 million lb
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    - 2,328 mt    5.132 million lb
  - Discards
    - 5,611 mt    12.371 million lb
  - Rec Removals
    - 898 mt    1.979 million lb
- 
- **Total 12,136 mt 26.755 million lb**

# Stochastic estimator of F

## F1: Female Catch vs exploitable biomass



## Cumulative distribution of F in 2007 for Spiny Dogfish



# Spiny dogfish – Summary of Stock Status

|              |    |
|--------------|----|
| Overfished:  | NO |
| Overfishing: | NO |

## Rationale:

Female biomass estimate  $\sim 141$  kmt  $> B_{\text{threshold}} = 100$  kmt  
and

$$F_{\text{Target}} = 0.11 = F_{2007} \sim 0.1104 < F_{\text{Threshold}} = 0.39$$

# General Conclusions

- Stock appears to be rebuilt
  - $SSB_{2008} >$  target biomass of 200 kmt
  - $\text{Prob}(SSB > B_{\text{target}}) \sim 75\%$
  
- Overfishing is not occurring
  - $F_{2007} \sim F_{\text{rebuild}}$
  - $\text{Prob}(F_{2007} < F_{\text{threshold}}) \approx 100\%$ .



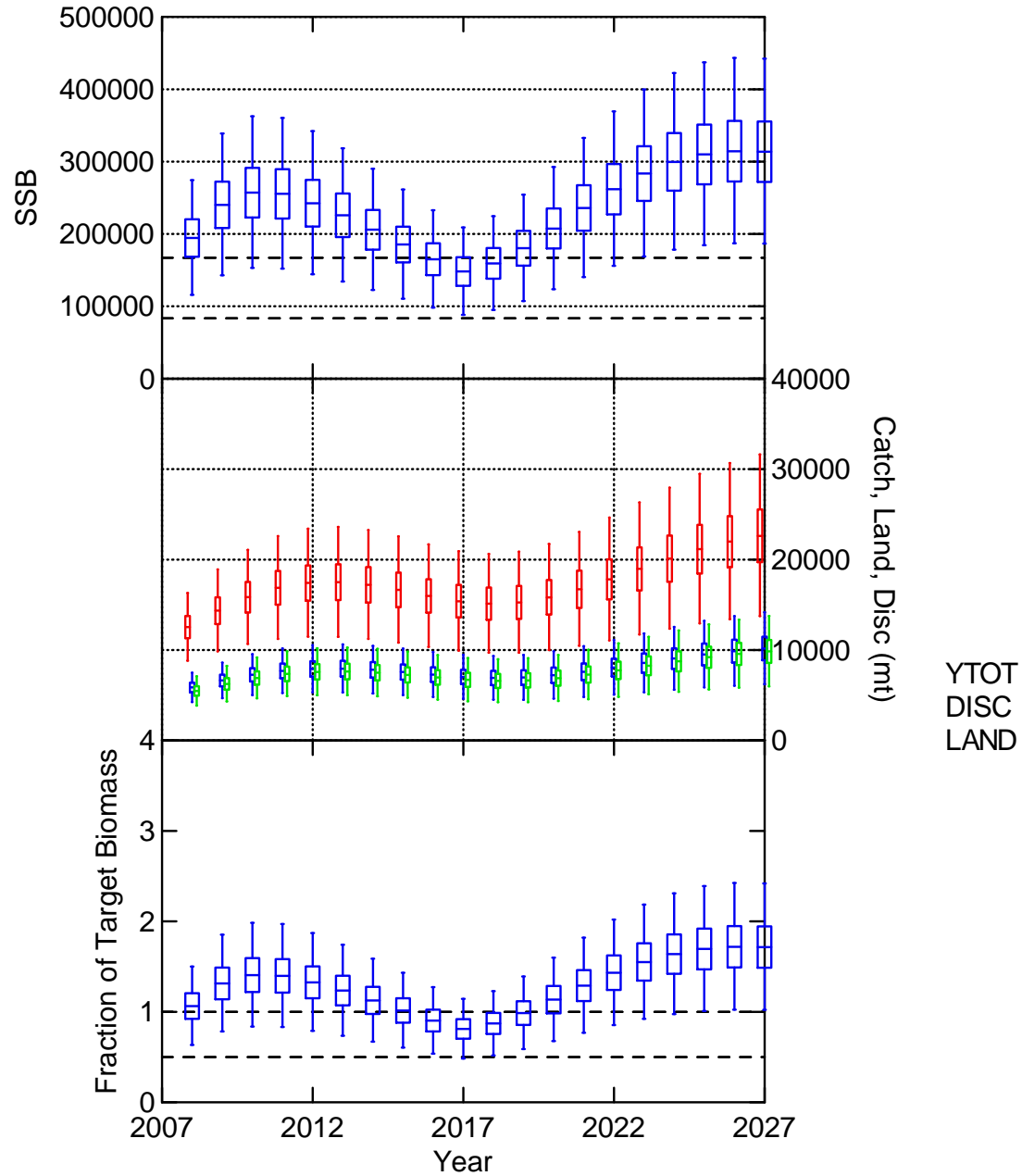
# Caveats

- The size frequency of the female population is concentrated between 75 and 95 cm with very few fish above 100 cm or below 70 cm.
- The low numbers of juvenile female and male dogfish imply that the population will oscillate over time.
- The decline will be induced by the sequence of poor recruits from the last ten years. In other words the recruitment deficit will have to be paid back.
- SSB should increase again *IF* pup survival rates begin to increase. Recruitment in the past 5 years has been modest but well below expectations.
- The consequences of the skewed sex ratio of 4:1 for mature males to mature females has unknown implications for future reproductive success.

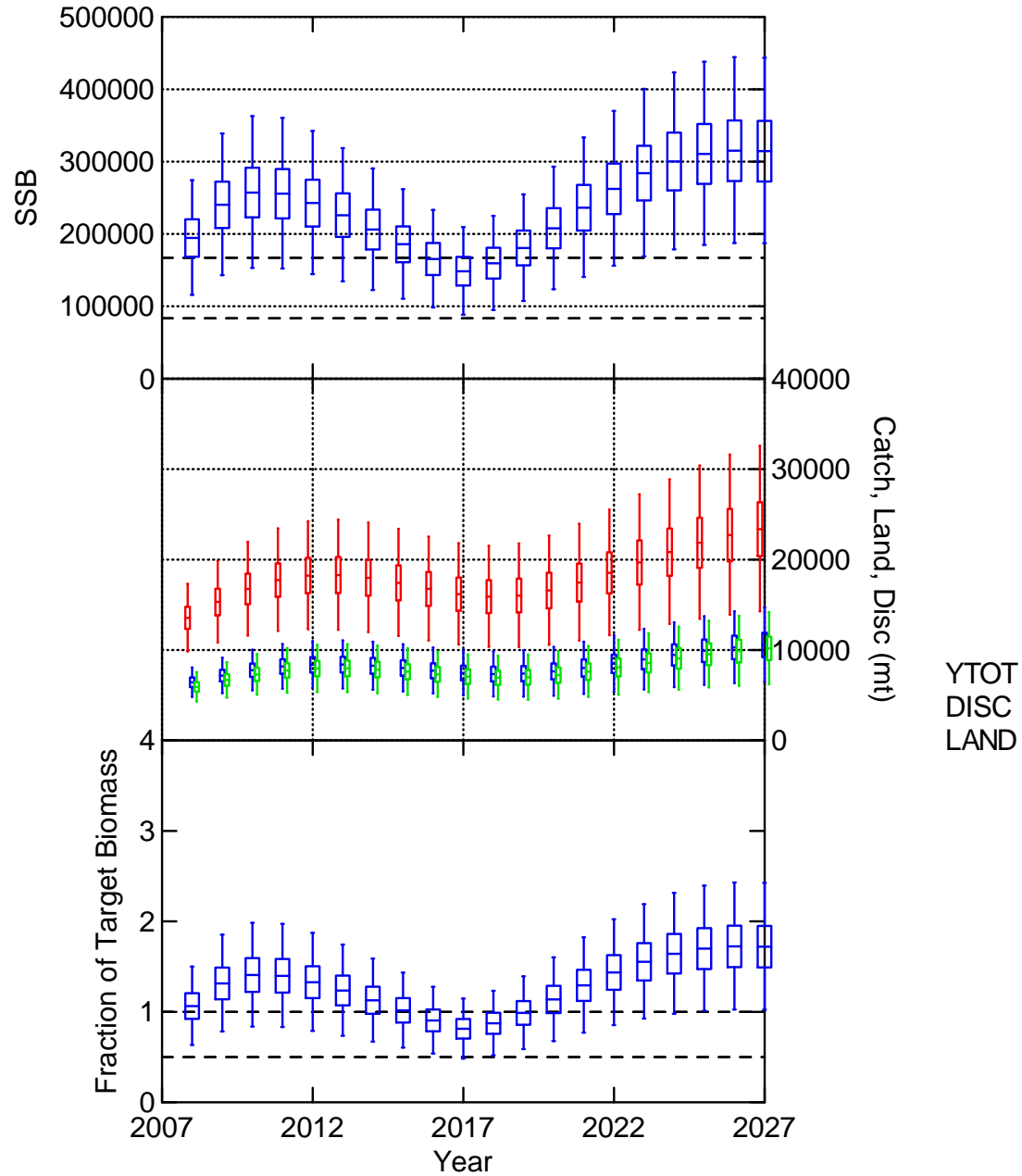
# Projections

1. Six scenarios
2. All assume that survival of pups is at average long term value (0.68 based on SARC 19).
3. All of the projections will be overly optimistic if this assumption is not true.
4. A common feature of all the scenarios is an oscillation as the present population increases through growth and declines as the last decade's low recruitment feeds into the adult population.
5. Only after the new recruits begin to contribute to the population does the population continue its rebuilding path.

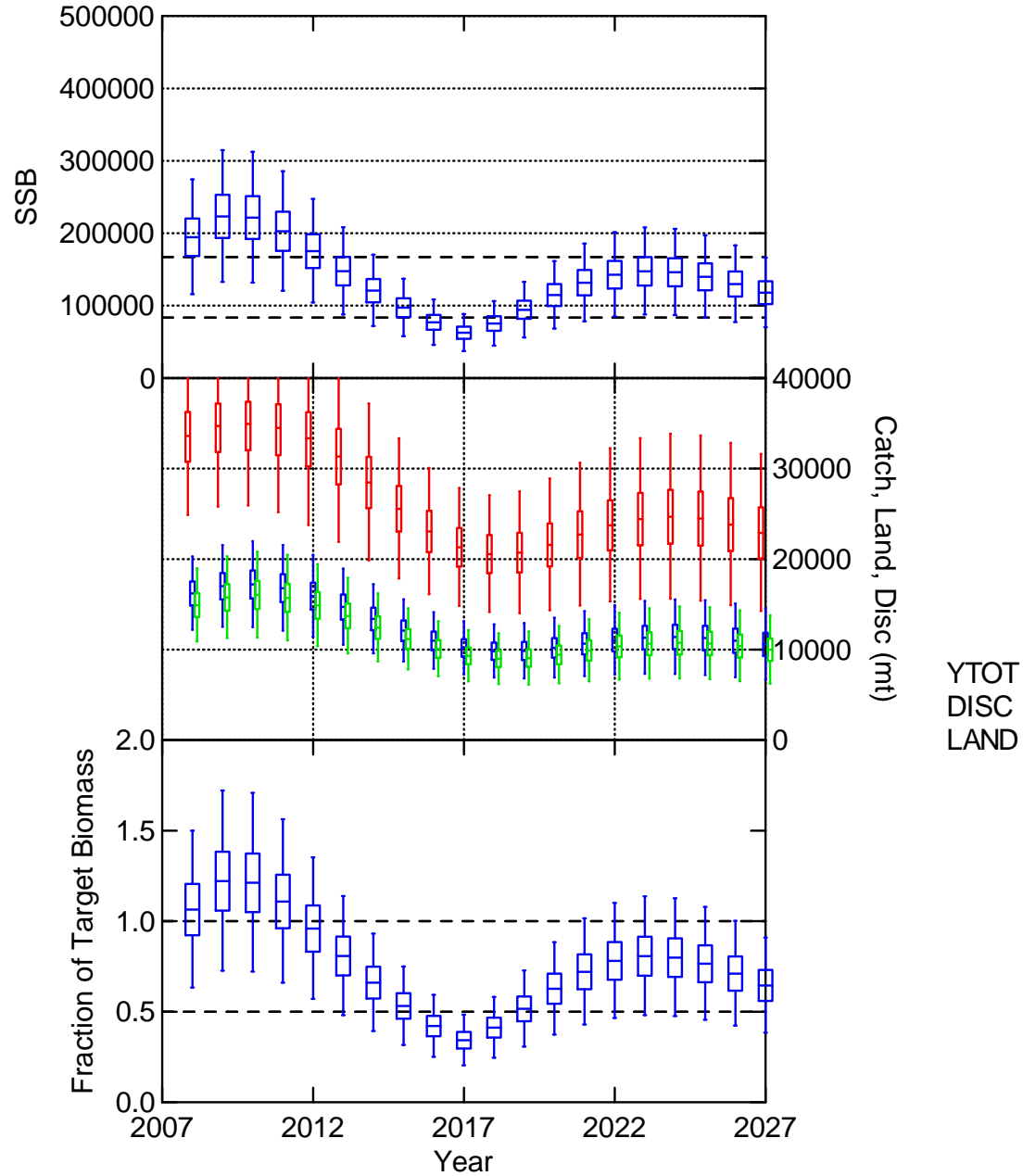
# F Status quo Scenarios



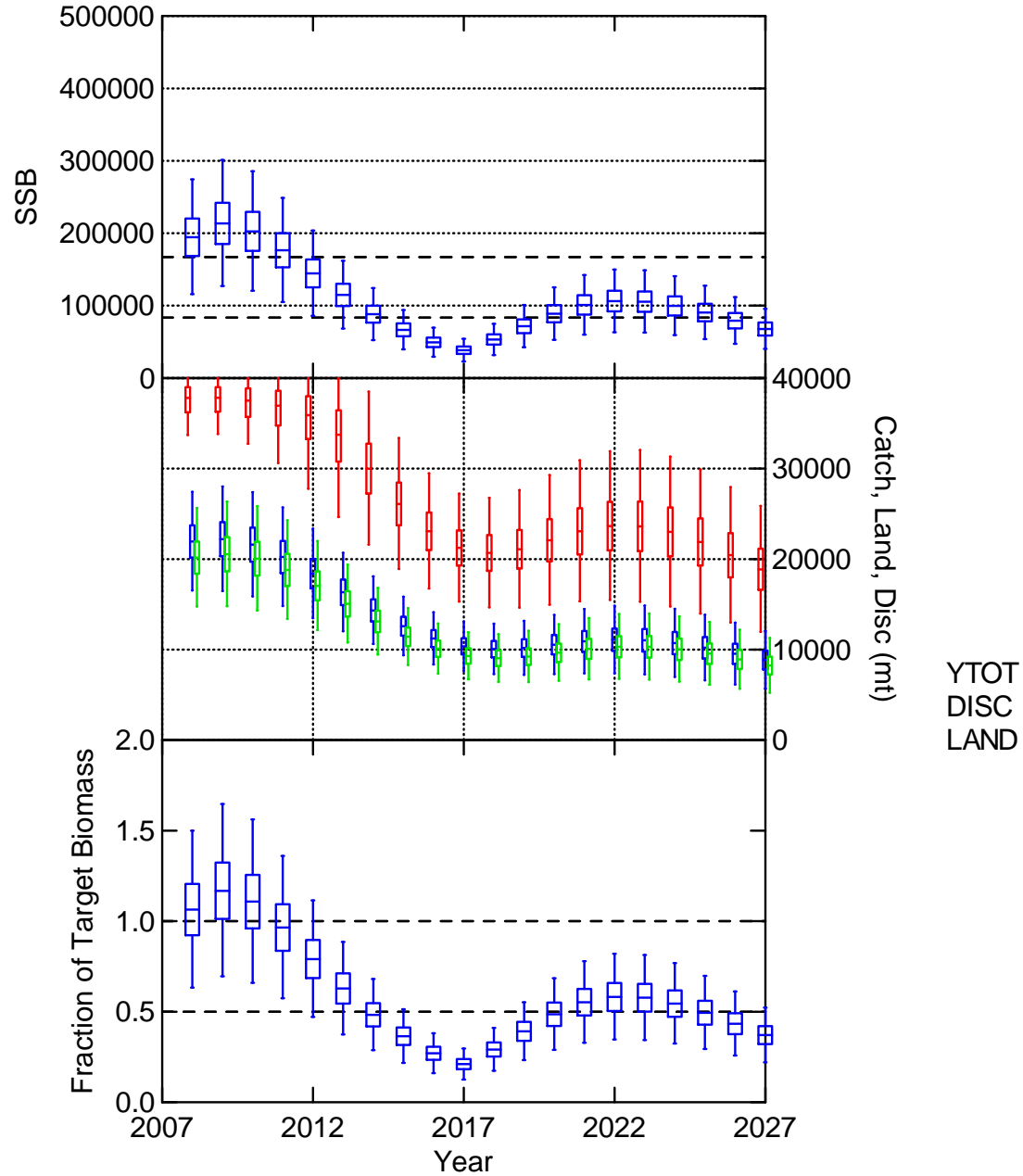
# F rebuild Scenarios



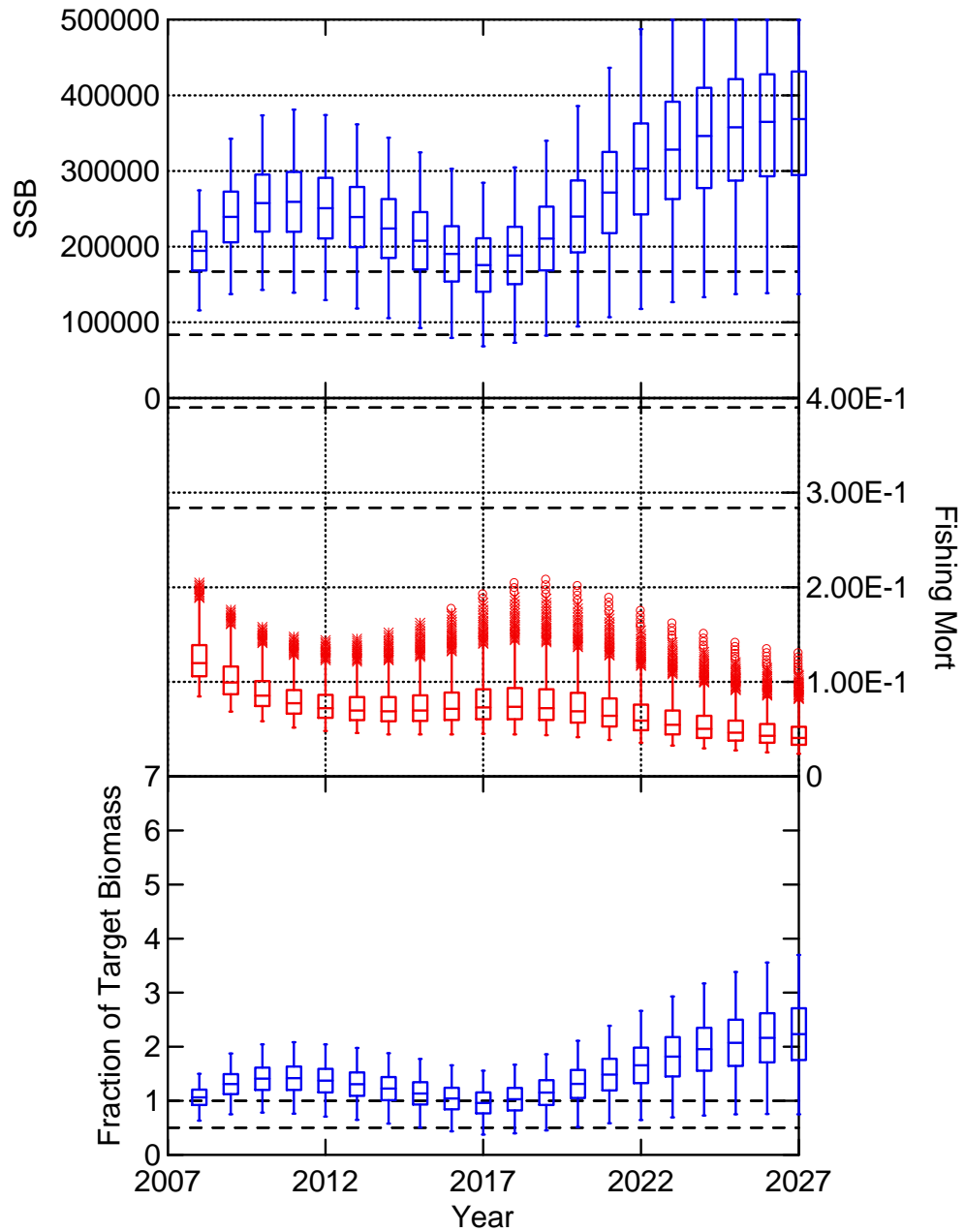
# F target Scenarios



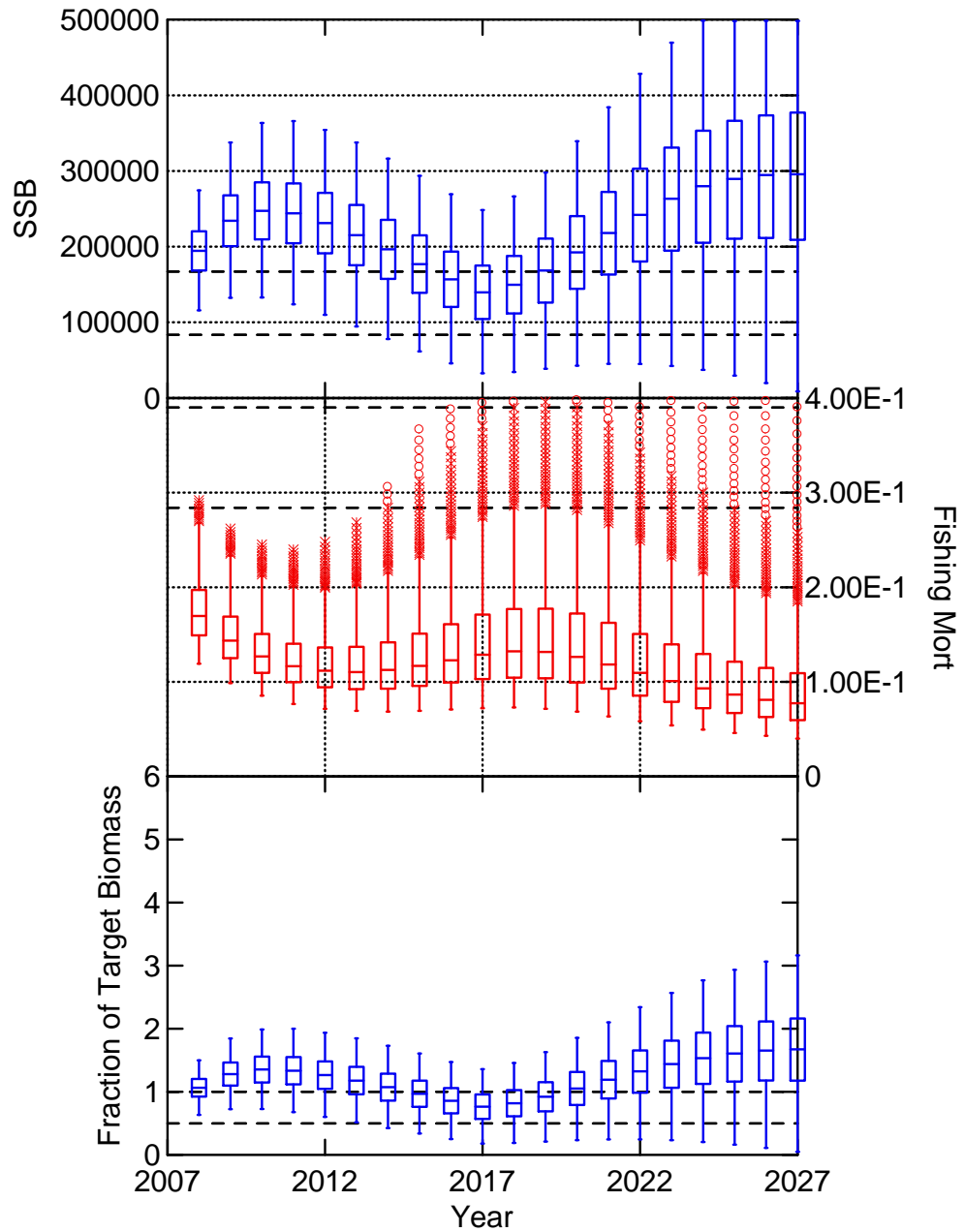
# F Threshold Scenarios



# Q\_status quo Scenarios



# Q\_status quo + 5000 mt Scenarios





# MC/SSC

## Recommendations

- Set commercial quota for FY 2009 to achieve  $F_{\text{rebuild}}$  (0.11)
  - **12.0 million lbs**
    - Scientific uncertainty in officially declaring stock to be “rebuilt”
    - current size distribution of mature females compared to the size structure used to develop the Bmsy proxy
    - harvest at the F target for a rebuilt stock (0.28) would result in the stock returning to an overfished status
    - constraining factors on stock productivity
    - benchmark assessment is expected for 2009

# MC/SSC

## Recommendations

- Trip limits:
  - 3,000 lbs
    - Large increase unadvisable
    - 3,000 lb trip limit in 2007 coincided with realized F equivalent to  $F_{\text{rebuild}}$
    - 3,000 lb trip limit in Federal waters may relieve some of the pressure on nearshore (female) dogfish
- Male-only fishery
  - No: discard F on females would to increase

# Joint Committee Recommendations

- Commercial Quota:
  - 12.0 million lbs
- Trip limits:
  - 3,000 lbs
- Noted:
  - Need to prevent protracted closures
  - Market demand (European export) has greatly diminished
  - Possible that recommended quota will not be landed