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# Yellowtail Flounder Estimates from the VIMS Scallop Dredge Surveys in Closed Area II

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# Background

- VIMS has conducted surveys for scallops since 1999. Simultaneously towing both commercial and NMFS scallop survey dredges
- Surveys in the scallop access area of Closed Area II (southern portion) occurred in 2005, 2007, 2008, and 2011
- Yellowtail flounder were recorded during survey
- Estimates of abundance in the study area are derived from mean catch rates
  - Size distributions provided as well

# Survey Details

- VIMS conducts industry-based sea scallop surveys primarily of rotational management areas prior to re-openings to estimate scallop biomass. Finfish bycatch information is also collected on the surveys.
- The access area of Closed Area II was surveyed in 2005 (Aug.), 2007 (May), 2008 (July) and 2011 (May) aboard the F/V *Celtic.*
- The survey design consists of a systematic random grid that covers the entire access area.
- Two dredges towed simultaneously with specifications:
    - A 15 ft. commercial dredge (4 inch rings, 10 inch twine top, NB style frame (2005-2008), CFTDD (2011).
    - A 8 ft. NMFS survey dredge (2 inch rings, 3.5 inch twine top, 1.5 inch liner), standard design (2005, 2007) prototype design (2008, 2011).
- A standard survey tow consists of a 15 minute tow at 3.8-4.0 kts with a 3:1 scope.
- The entire catch of finfish bycatch for each dredge type and each tow was measured to the nearest centimeter (TL). Individual weights were estimated based on seasonal, species specific parameters in Wigley et. al., 2003.

# Results

- Survey dredge caught smaller yellowtail flounder than commercial dredge
  - This was due to the size selective characteristics of the commercial gear
  - The lined survey dredge is assumed to be non size selective.
  - Yellowtail do not become fully selected by the currently regulated commercial dredge configuration until approximately 35-40 cm TL

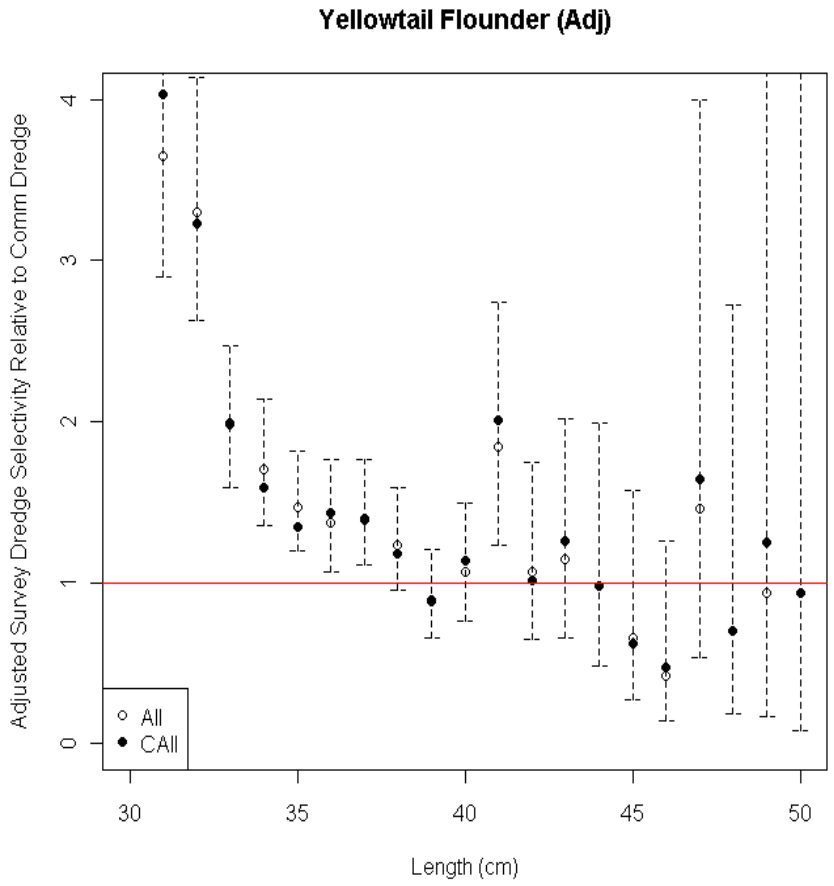
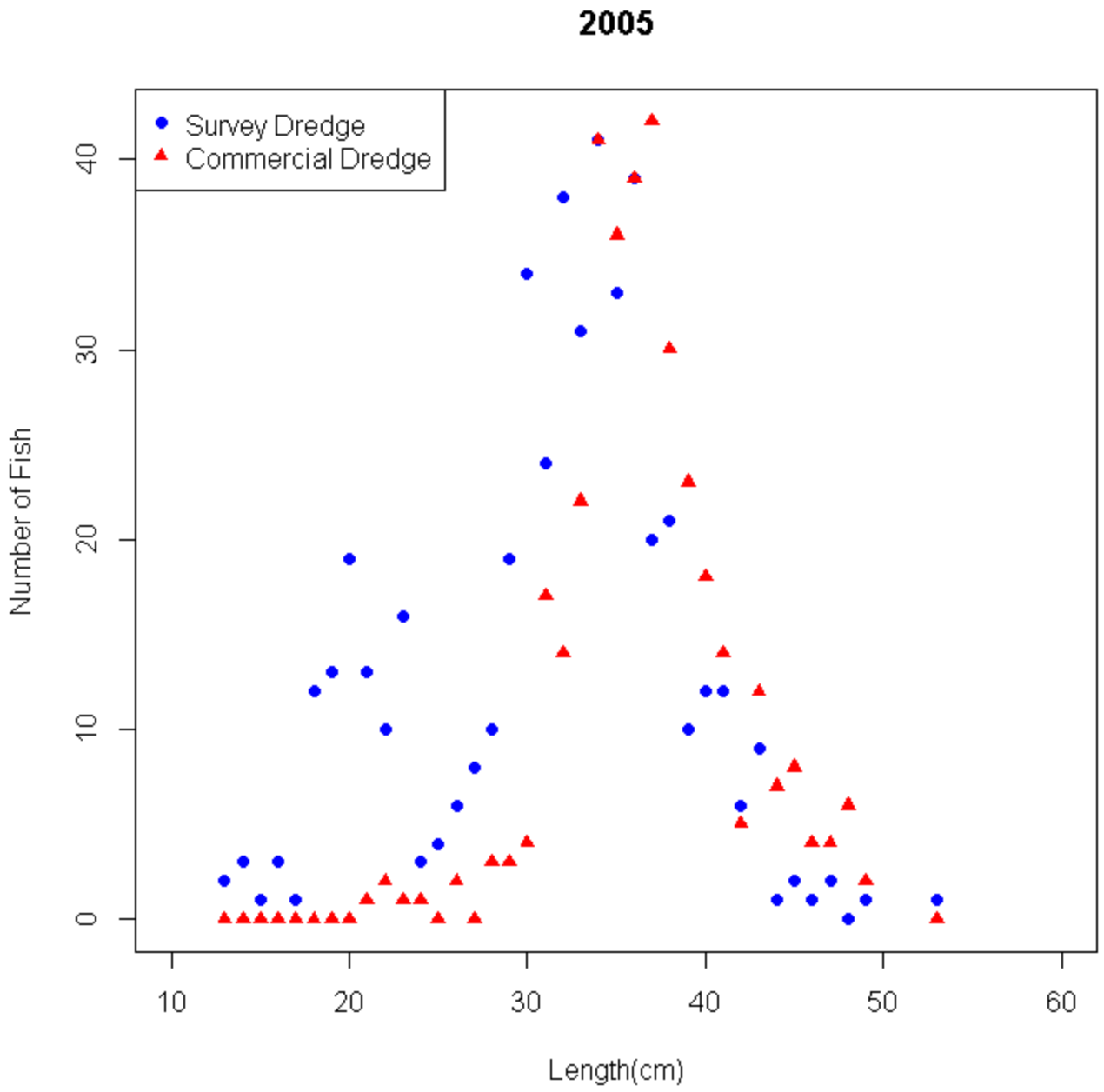
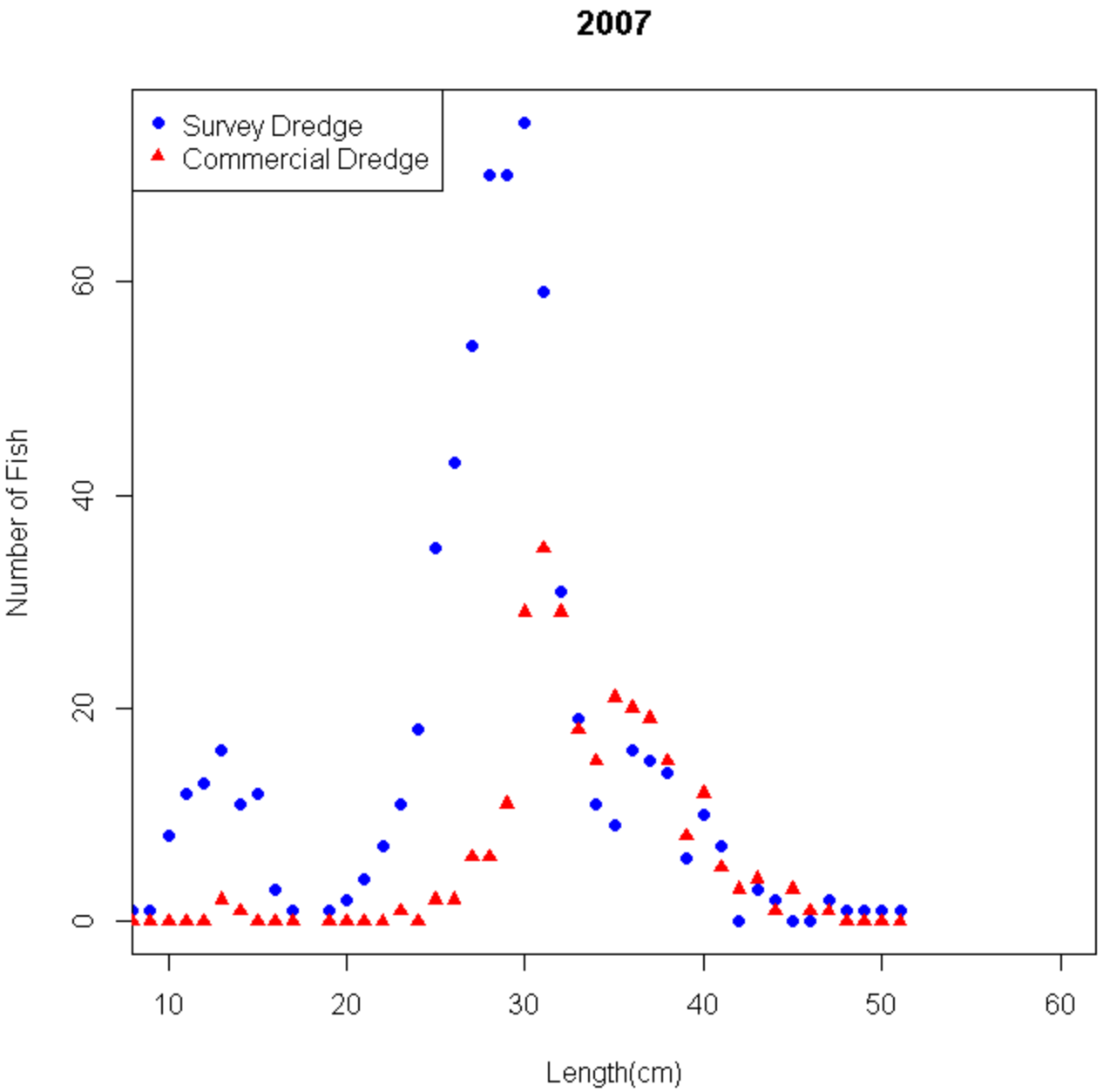
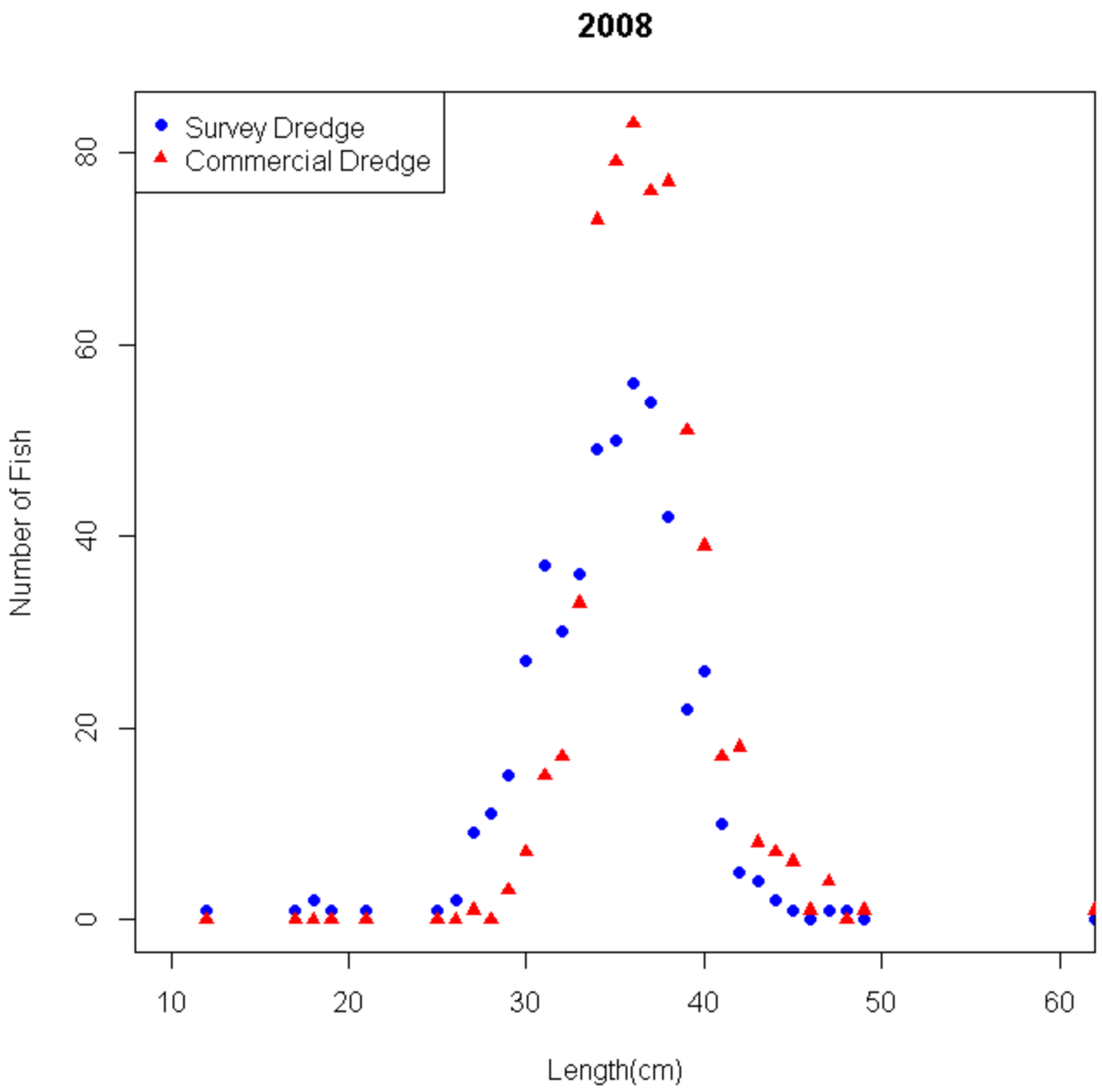
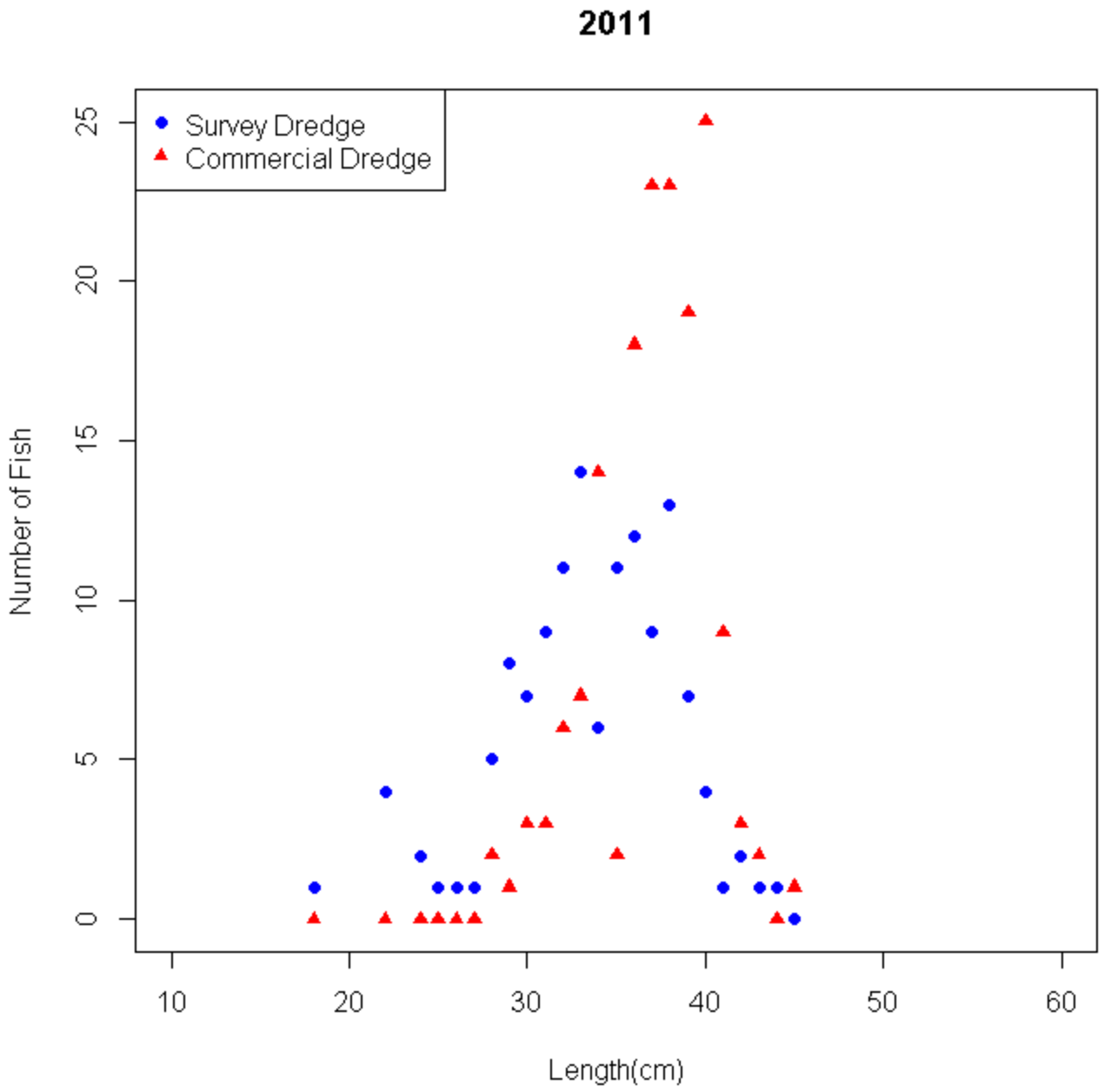



Figure from: Legault et. al., 2010. Yellowtail Flounder Catch at Length by Scallop Dredges: A Comparison between Survey and Commercial Gear. TRAC Working Paper 2010/


2005
Survey Dredge
Commercial Dredge
Number of Fish
0
10
20
30
40
10
20
30
40
50
60
Length(cm)


2007
Survey Dredge
Commercial Dredge
Number of Fish
0
20
40
60
10
20
30
40
50
60
Length(cm)


2008
Survey Dredge
Commercial Dredge
Number of Fish
0
20
40
60
80
10
20
30
40
50
60
Length(cm)


2011
Survey Dredge
Commercial Dredge
Number of Fish
0
5
10
15
20
25
10
20
30
40
50
60
Length(cm)

# Catch Rates

- Trends differ somewhat by number vs weight and commercial vs survey dredge (due to differences in selectivity of the gears)

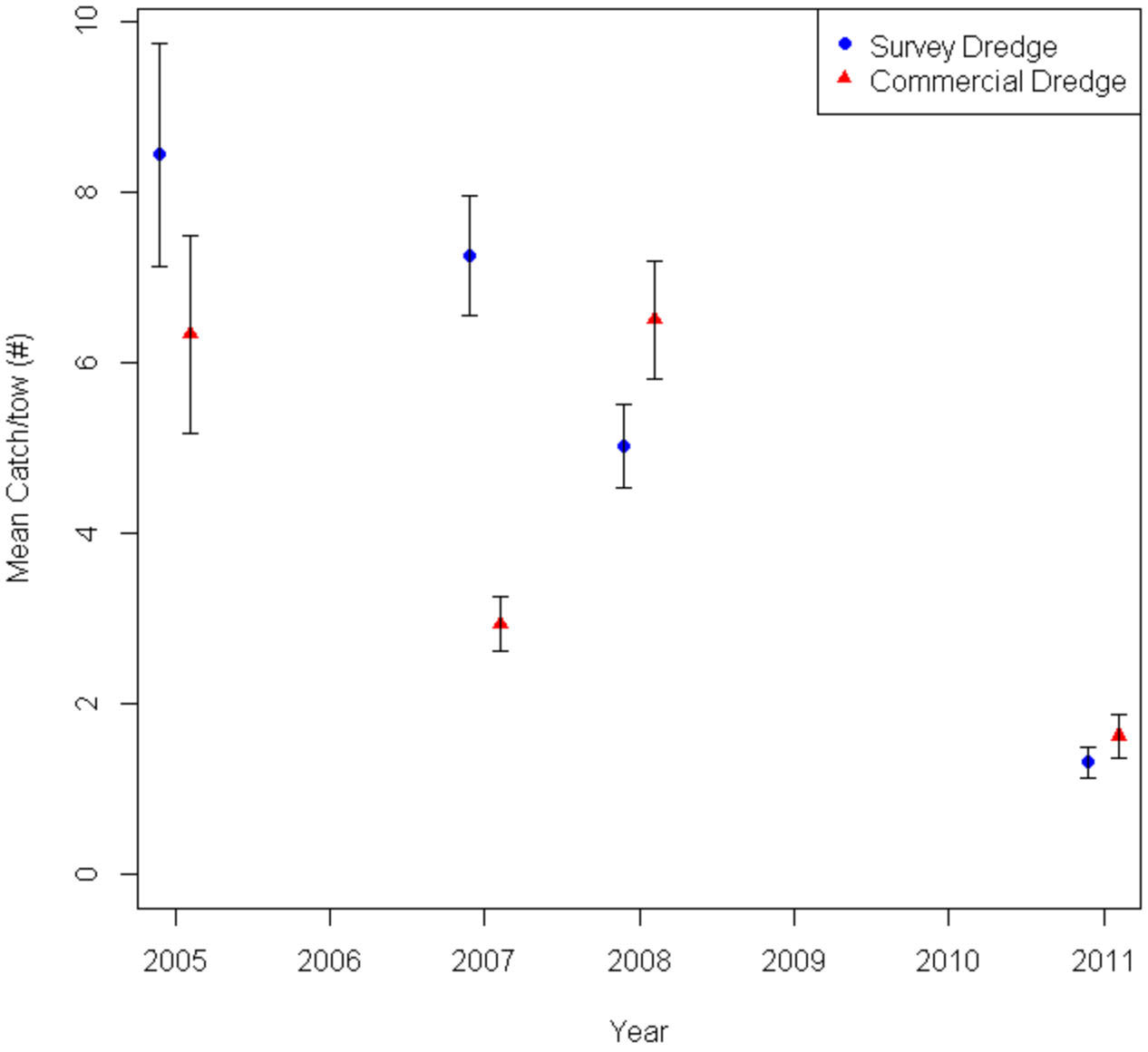
**Catch/tow (numbers)**

| | Survey Dredge | | | Commercial Dredge | | |
|---|---|---|---|---|---|---|
| Year | Mean | Std Dev | CV | Mean | Std Dev | CV |
| 2005 | 8.44 | 1.31 | 16% | 6.33 | 1.15 | 18% |
| 2007 | 7.27 | 0.70 | 10% | 2.93 | 0.32 | 11% |
| 2008 | 5.02 | 0.48 | 10% | 6.51 | 0.70 | 11% |
| 2011 | 1.32 | 0.18 | 14% | 1.63 | 0.25 | 16% |

**Catch/tow (kg)**

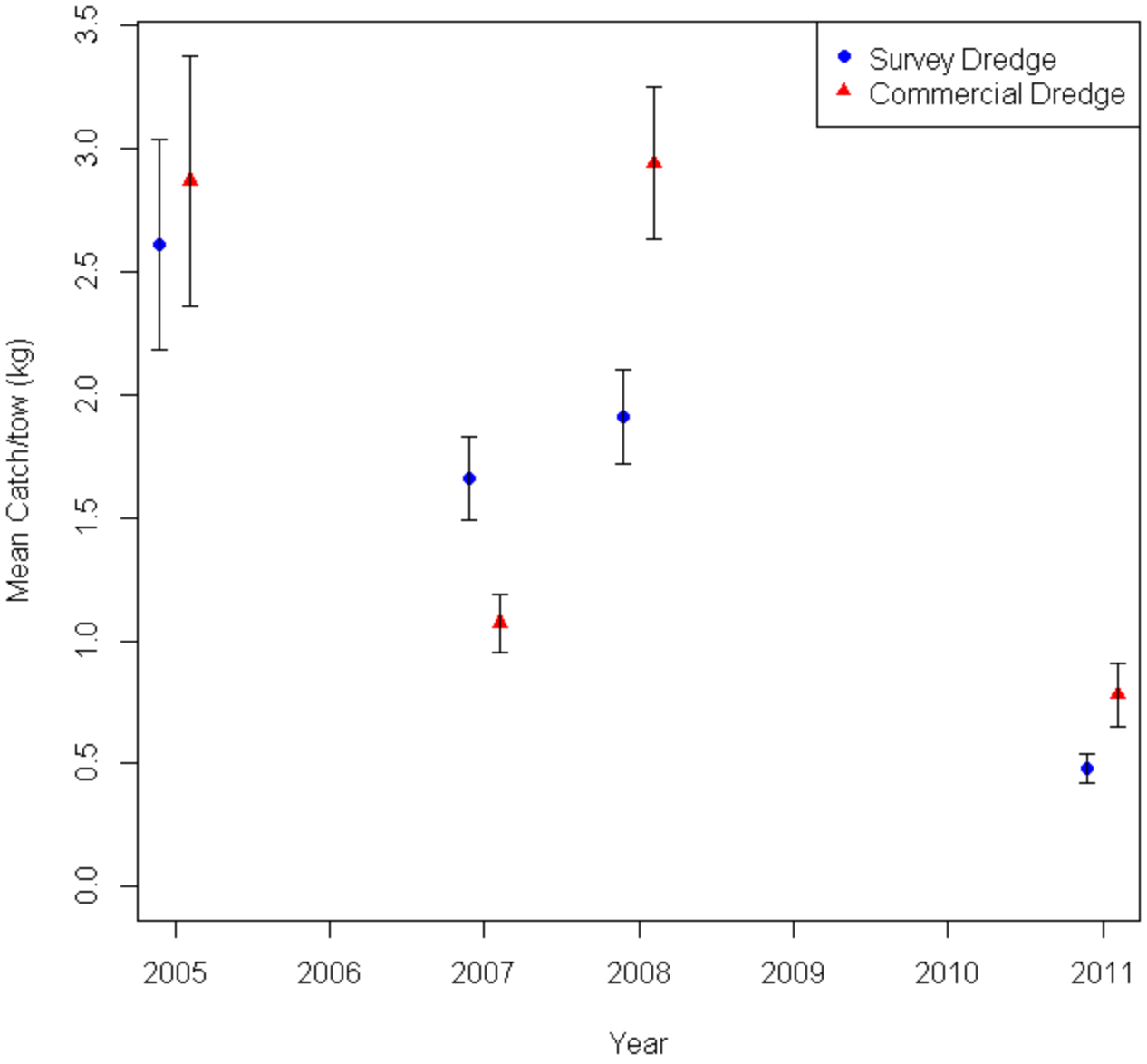
| | Survey Dredge | | | Commercial Dredge | | |
|---|---|---|---|---|---|---|
| Year | Mean | Std Dev | CV | Mean | Std Dev | CV |
| 2005 | 2.62 | 0.43 | 16% | 2.88 | 0.51 | 18% |
| 2007 | 1.67 | 0.17 | 10% | 1.08 | 0.12 | 12% |
| 2008 | 1.92 | 0.19 | 10% | 2.95 | 0.31 | 10% |
| 2011 | 0.48 | 0.06 | 14% | 0.78 | 0.13 | 17% |

# Catch/tow (numbers)




Error bars and plus/minus one standard deviation of the mean

# Catch/tow (kg)


Survey Dredge
Commercial Dredge
Mean Catch/tow (kg)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
2005
2006
2007
2008
2009
2010
2011
Year

# Convert to Population Estimates for Study Area

| Year | Gear | Number per Tow | Swept Area/Tow (m^2) | Domain (km^2) | Est. Population (numbers) q=1.0 | Est. Population (numbers) q=0.46 |
|---|---|---|---|---|---|---|
| 2005 | COMM | 6.33 | 8,938.26 | 3,865 | 2,738,600 | 5,953,479 |
| 2007 | COMM | 2.93 | 8,467.34 | 3,865 | 1,339,608 | 2,912,192 |
| 2008 | COMM | 6.51 | 8,234.17 | 3,865 | 3,053,474 | 6,637,987 |
| 2011 | COMM | 1.63 | 8,394.19 | 3,865 | 748,791 | 1,627,806 |
| 2005 | SURVEY | 8.44 | 4,767.07 | 3,865 | 6,841,766 | 14,873,403 |
| 2007 | SURVEY | 7.27 | 4,515.92 | 3,865 | 6,221,104 | 13,524,140 |
| 2008 | SURVEY | 5.02 | 4,391.56 | 3,865 | 4,418,266 | 9,604,926 |
| 2011 | SURVEY | 1.32 | 4,476.90 | 3,865 | 1,142,371 | 2,483,415 |

| Year | Gear | Average Weight per Tow (kg) | Swept Area/tow (m^2) | Domain (km^2) | Est. Biomass (MT) q=1.0 | Est. Biomass (MT) q=0.46 |
|---|---|---|---|---|---|---|
| 2005 | COMM | 2.88 | 8,938.26 | 3,865 | 1,243.96 | 2,704.25 |
| 2007 | COMM | 1.08 | 8,467.34 | 3,865 | 491.78 | 1,069.08 |
| 2008 | COMM | 2.95 | 8,234.17 | 3,865 | 1,383.30 | 3,007.18 |
| 2011 | COMM | 0.78 | 8,394.19 | 3,865 | 360.00 | 782.60 |
| 2005 | SURVEY | 2.62 | 4,767.07 | 3,865 | 2,123.03 | 4,615.27 |
| 2007 | SURVEY | 1.67 | 4,515.92 | 3,865 | 1,425.59 | 3,099.11 |
| 2008 | SURVEY | 1.92 | 4,391.56 | 3,865 | 1,688.20 | 3,670.01 |
| 2011 | SURVEY | 0.48 | 4,476.90 | 3,865 | 414.56 | 901.21 |

- Based upon the catch data, and areal coverage of the sampling for each survey, estimates of population size (number) and biomass (MT) are shown.
- We present a minimum estimate due an assumed dredge efficiency of 100% as well as an estimated dredge efficiency for yellowtail of 46% from Shank et al. (2013)

# Conclusions

- VIMS dredge surveys of the access area of CA2 provide a snapshot of yellowtail abundance and size structure at discrete times.
- The different gears used in the survey allow for insight into the selective nature of the commercial gear, but also allows for estimates of juvenile yellowtail that are retained in the lined NMFS scallop dredge.
- Seasonality in yellowtail abundance in CA2 may be a consideration in assessing trend over time.

# For more information


- Legault et. al., 2010. Yellowtail Flounder Catch at Length by Scallop Dredges: A Comparison between Survey and Commercial Gear. TRAC Working Paper 2010/.
- DuPaul, W.D. and D.B Rudders. 2006. An Assessment of Sea Scallop Abundance and Distribution in Selected Areas of Georges Bank and the Mid-Atlantic. VIMS Marine Resource Report 2006-2. 29pp.
- DuPaul, W.D. and D.B Rudders. 2008. An Assessment of Sea Scallop Abundance and Distribution in Selected Areas: Georges Bank Area I and II, Nantucket Lightship and Elephant Trunk. VIMS Marine Resource Report 2008-3. 47pp.
- Rudders, D.B. and W.D. DuPaul. 2009. An Assessment of Sea Scallop Abundance and Distribution in Selected Areas: Georges Bank Area II and The DelMArVa Area. VIMS Marine Resource Report 2009-7. 42pp.
- Rudders, D.B. and W.D. DuPaul. 2009. An Assessment of Sea Scallop Abundance and Distribution in a Selected Closed Area: Georges Bank Closed Area II. VIMS Marine Resource Report 2012-6. 40pp.
- Shank, B., Hart, D., Gallager, S., York, A., and Stokesbury, K. 2013. Abundance and spatial distribution of Yellowtail Flounder in Closed Area II South, 2010 vs. 2012, from an image-based survey. Working Paper presented to the 2013 Transboundary Resource Assessment Committee.