Spiny dogfish – trawl observer data trend analysis summary.

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Staff began with 1990-2019 trawl[1] observer data. 2020-mid 2022 observer data is heavily impacted by Covid-19 and reduced observer coverage.

Staff then removed unobserved hauls, hauls shorter than 0.5 hours, and hauls longer than 6 hours (i.e. looking for typical observed hauls).

Staff then removed any hauls that included spiny dogfish in the first three targeted species fields in an effort to capture just incidental catch trends.

Staff then totaled the yearly catch (retained and discarded) of spiny dogfish on these hauls.

Staff then totaled the yearly hours of observed tow duration represented by these hauls (HAULDUR calculated field in observer data tables).

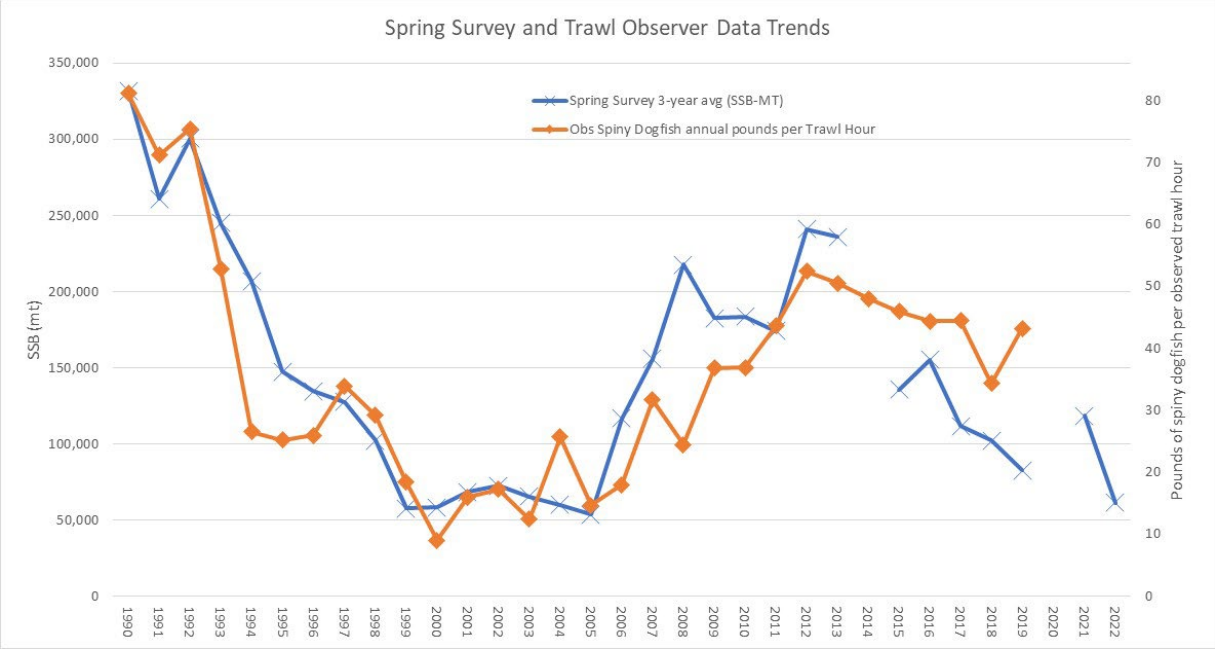
Staff then divided yearly catch by yearly hours to calculate "spiny dogfish pounds caught" per each "observed tow hour."

Staff then graphed (see next page) and calculated the excel correlation coefficient for the NEFSC spring 3-year average trawl survey data[2] and the staff-generated annual "spiny dogfish pounds" caught per "observed tow hour."

The correlation coefficient was 0.83 (1990-2019), which is a relatively high correlation for such data in staff's experience. While preliminary, exploratory, and basic, the similarity between the trends in the NEFSC trawl survey data and what the trawl fisheries appear to have experienced generally reinforced staff's perception of spiny dogfish abundance trends. The spiny dogfish research track assessment is working on a more refined CPUE analysis that incorporates observer and study fleet data, and that analysis should be available in December 2022 with the rest of the assessment.

[1] trawl: Includes bottom otter trawl, scallop trawl, twin trawl, Ruhle trawl, bottom paired trawl, haddock separator, shrimp trawl, midwater paired trawl, and midwater trawl.

[2] 2014 and 2020 are missing due to survey vessel problems in those years – the averages for each subsequent year are 2-year averages that bridge (one before, one after) the missing year.



SAS Code

```
data ha01; set sasdata.trawl;
if OBSRFLAG = 1;
*Get rid on non-observed hauls;

if year ge 1990;

if HAULDUR ge .5;
if HAULDUR gt 6 then delete;
*Get rid of odd hauls;
run;


data ha02; set ha01;
if targspec1 = 3521 then delete;
if targspec2 = 3521 then delete;
if targspec3 = 3521 then delete;
*get rid of directed fishing;
run;


data ha03; set ha02;
if nespp4 = 3521;
*spiny dogfish #;
run;

data ha04; set ha03;
proc sort; by year;
proc means sum noprint;
var HAILWT;
by year;
```

```
output out = ha05 sum = DogWtLb;
run;

proc export data=ha05
    outfile="C:\Sas Outputs/my_data1.xlsx"
    dbms=xlsx
    replace;
    sheet="First Data";
run;

data ha06; set ha02;
proc sort nodupkey; by link3;  *one record per haul;
proc sort; by year;
proc means sum noprint;
var HAULDUR;
by year;
output out = ha07 sum = obtwhours;
run;

proc export data=ha07
    outfile="C:\Sas Outputs/my_data2.xlsx"
    dbms=xlsx
    replace;
    sheet="First Data";
run;
```