



## New England Fishery Management Council

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Rip C. Cunningham, *Chairman* | Paul J. Howard, *Executive Director*

### MEMORANDUM

**DATE:** November 1, 2011  
**TO:** Whiting Oversight Committee and Advisory Panel  
**FROM:** Whiting PDT  
**SUBJECT:** Hake management area and quarterly allocations

Over the past two months, the Whiting Advisory Panel and Whiting Oversight Committee developed a list of draft alternatives and management measures for Amendment 19. Included in these were two allocation alternatives to ensure equitable access throughout the fishing year. Both serve as options to a simple annual (TAL) limit by stock area. Annual limits could otherwise result in prolonged closures and derby style fishing behavior as landings reach the annual limits. These alternatives were approved by the Council for analysis and inclusion in Draft Amendment 19.

In the northern stock area, the advisors and Oversight Committee developed an alternative to allocate TAL by exemption area or management program, with the balance to be allocated to the Gulf of Maine Exemption Area. Landings from vessels fishing in the five small mesh exemption areas would be counted toward individual area quotas. Possession limits for vessels fishing in these areas would decline to incidental levels when the landings for red or silver hake reached a TAL trigger point (often 90%). Overages would count against the overall TAL for the northern stock area and unharvested TAL would roll from the Cultivator Shoals Area allocation to the other exempted areas (there does not seem to be any guidance as to the proportions of the in-season adjustment, possibly a matter for PDT advice). The reason for triggering an incidental limit is that vessels can sometimes target one species in an exempted area without catching many of the other species.

In the southern stock area, the advisors and Oversight Committee developed an alternative with a contingent allocation of TAL by fishing year quarter (i.e. quarters beginning in May). When the prior year's landings exceed 2/3rds of the TAL, the alternative would trigger a quarterly allocation of TAL based on proportional landings by species (red hake, silver and offshore hake combined).

The mechanism for monitoring the quota and its response is not important for the purpose of this analysis. What is important is that the Advisors and Oversight Committee decided to

make TAL allocations by area or management program proportional to landings during 2004 to 2010 in the northern stock area and during 2008-2010 in the southern stock area. In the northern stock area, the 2004-2010 period represents the duration of the small mesh exemption programs. In the southern stock area, the 2008-2010 period best represents recent fishery performance. This analysis estimates those proportions and inter-annual variation which may complicate matters.

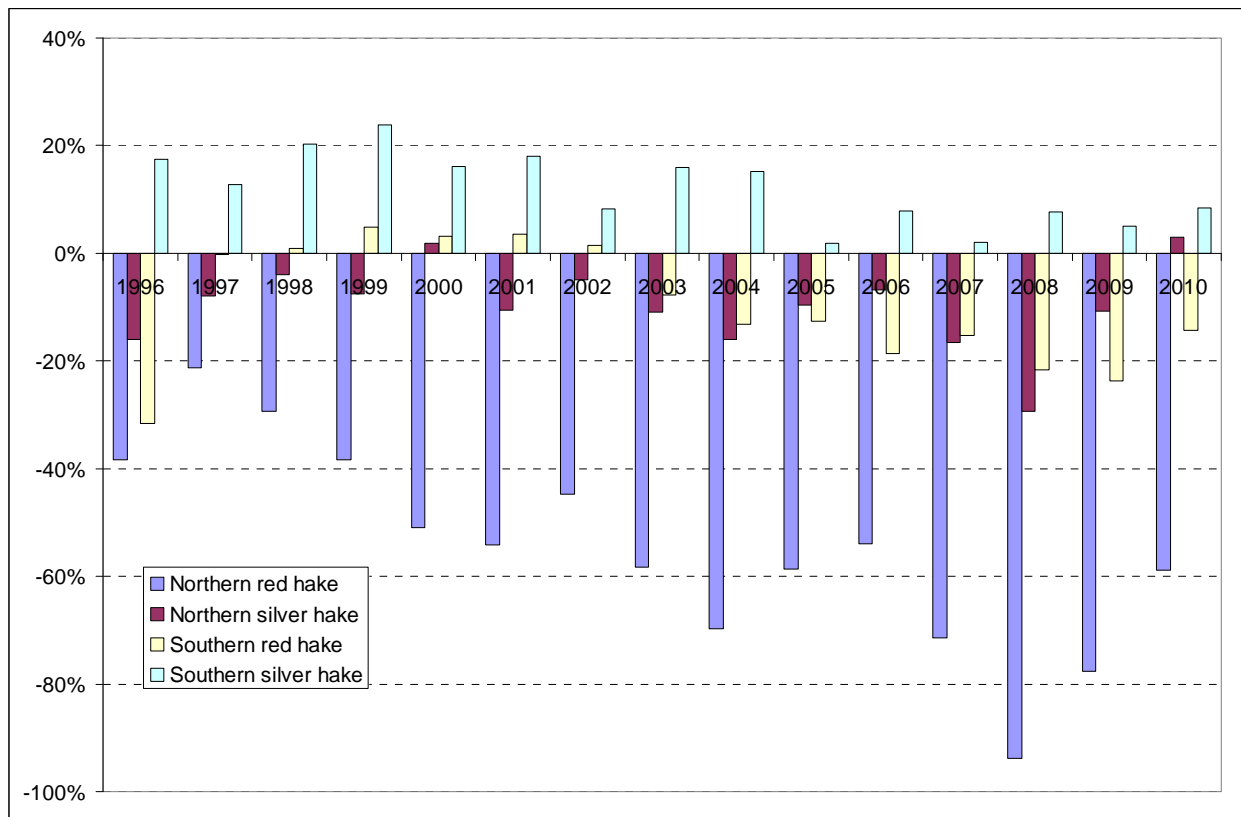
As you know, there are two potential sources of landings data. Dealer reported data (SAFIS system) are considered the most accurate representation of pounds actually landed. The processed weights are always converted to live weight using accepted and well documented conversions. Unlike some other species, hake landings reports by dealers often represent partial trips and may be transshipped across state lines before a report is made. The PDT recognizes instances where a significant portion of a VTR reported landings did not exist on dealer reports – particularly when multiple dealers were sold product off the same trip. This has been a historic problem and compliance has improved, but it still existed as recently as 2008 in some cases, particularly for trips from the small mesh exemption areas.

The other source of landings data comes from the vessel trip reports (VTRs) made by fishermen. These data are supposed to represent the best estimate of retained catch in whole weight before landing. In practice, however, the VTR data are inconsistent. Sometimes weights are reported as landings weight and at other times represent the actual trip limit as an approximation of retained catch. But unlike the dealer reports, the VTRs also include landings that are transferred at sea to another vessel, often for bait use.

To estimate allocation proportions for the two areas, a comparative analysis of the two data sets are presented. The Council may wish to consider the results as a range of allocation proportions to include in the draft amendment and to take to public hearing.

The figure below illustrates an overall comparison of the landings from the two data sets. In general, the silver hake landings reported by dealers in the southern region are slightly above the VTRs, less than 10% difference since 2005 with the exception of 2008. It is possible that duplicate reports by different dealers or missing VTRs contribute to the differences. Southern red hake landings on VTRs tend to be higher, on the other hand. In the northern region, both silver hake and to a much larger extent red hake landings are higher on VTRs than those reported by dealers. The differences appear to arise mostly from transfers at sea for bait, particularly for red hake.

**Figure 1.** Annual comparison of annual red and silver hake landings by stock area from dealer/SAFIS and VTR data sources. To the extent possible, all data are in live weight. Positive values mean that the SAFIS data are greater than those reported by fishermen on VTRs, and vice versa.



**Northern stock area**

Dealer (SAFIS) and VTR data from 2004-2010 were analyzed to determine the average proportion of landings derived from each management area, based on the month of landing, the reported (or estimated via standard NEFSC methods when VTRs cannot be associated with the trip) statistical area, and the mesh size reported in use on trips/landings with a VTR serial number.

Trips with landings during months when the following areas were open were assigned to the following management areas (see table below): Cultivator Shoals Area (mesh<3 inches or not reported; and landings from statistical area 522 from Jun 15 to Oct 31), MA Raised Footrope Area (mesh<3 inches or not reported; and landings from statistical area 521 and 514 when latitude south of 42°20' N from Sep 1 to Dec 31), Small Mesh Area II (mesh<3 inches or not reported; and landings from statistical area 513 and 514 when latitude north of 42°20' N from Jan 1 to Jun 30), Small Mesh Area I (mesh<3 inches or not reported; and landings from statistical area 513 and 514 when latitude north of 42°20' N from Jul 15 to Nov 15), GOM Raised Footrope Area (mesh<3 inches or not reported; and landings from statistical area 513 and from Jun 1 to Nov 30).

Landings on trips using any other gear or trawls with mesh > 3 inches were assigned to the GOM exemption area when in the northern stock area. Thus the proportions in the analyses below represent landings made by vessels in the small mesh exemption program fishing in the areas listed above. All other trips were assigned to the GOM exemption area/northern stock area.

**Table 1.** Area, landings date, and mesh criteria with SQL code assigning dealer reported landings to small mesh exemption areas.

| Area                        | Statistical areas                      | Landings date   | Mesh  |
|-----------------------------|--|-----------------|---|
| Cultivator Shoals           | 522                                    | Jun 15 - Nov 30 | Not greater than 3 inches                   |
| MA raised footrope          | 521<br>514, south of 42°20' N latitude | Aug 1 – Dec 31  |   |
| Small mesh area I           | 513<br>514, north of 42°20' N latitude | Jul 15 – Nov 14 |   |
| Small mesh area II          | 513<br>514, north of 42°20' N latitude | Jan 1 – Jun 30  |   |
| GOM raised footrope         | 513                                    | Jun 1 – Nov 30  |   |
| GOMx exemption area         | 511-515, 521, 522, 561, 562            | Any             | Any except for trips meeting above criteria |
| SNE exemption area          | 525 - 543, 613                         | Any             | Any except for trips meeting above criteria |
| Mid-Atlantic exemption area | 611, 612, 614-638                      | Any             | Any except for trips meeting above criteria |

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case when (D.nemarea = '522' AND (D.month > '06' OR D.month = '06' AND D.day > '14')
AND D.month < 11)
    AND (mesh <= 3 OR mesh IS NULL) then 'Cultivator Shoals'
    when (D.nemarea = '521' AND D.month > '08') AND (mesh <= 3 OR mesh IS NULL)
then 'MA Raised Footrope'
    when (D.nemarea = '514' AND T.lat < 4220 AND D.month > '08') AND (mesh <= 3 OR
mesh IS NULL) then 'MA Raised Footrope'
    when ((D.nemarea = '513' OR (D.nemarea = '514' AND T.lat > 4220)) AND D.month <
'07') AND (mesh <= 3 OR mesh IS NULL) then 'SMA II'
    when ((D.nemarea = '513' OR (D.nemarea = '514' AND T.lat > 4220))
        AND (D.month > '07' OR D.month = '07' AND D.day > '14') AND (D.month < '11'
OR D.month = '11' AND D.day < '16'))
        AND (mesh <= 3 OR mesh IS NULL) then 'SMA I'
    when (D.nemarea = '513' AND D.month > '06' AND D.month < '12') AND (mesh <= 3
OR mesh IS NULL) then 'GOM Raised Footrope'
    when D.nemarea IN ('511','512','513','514','515','521','522','561','562') then 'GOM Mesh

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Area'  
    when D.nemarea = '613' or D.nemarea BETWEEN '525' and '543' then 'SNE Exempted  
Area'  
    when D.nemarea IN ('611','612') or D.nemarea BETWEEN '614' and '638' then 'MA  
Exempted Area'  
    else 'Unknown' END AS Mgmt_area,
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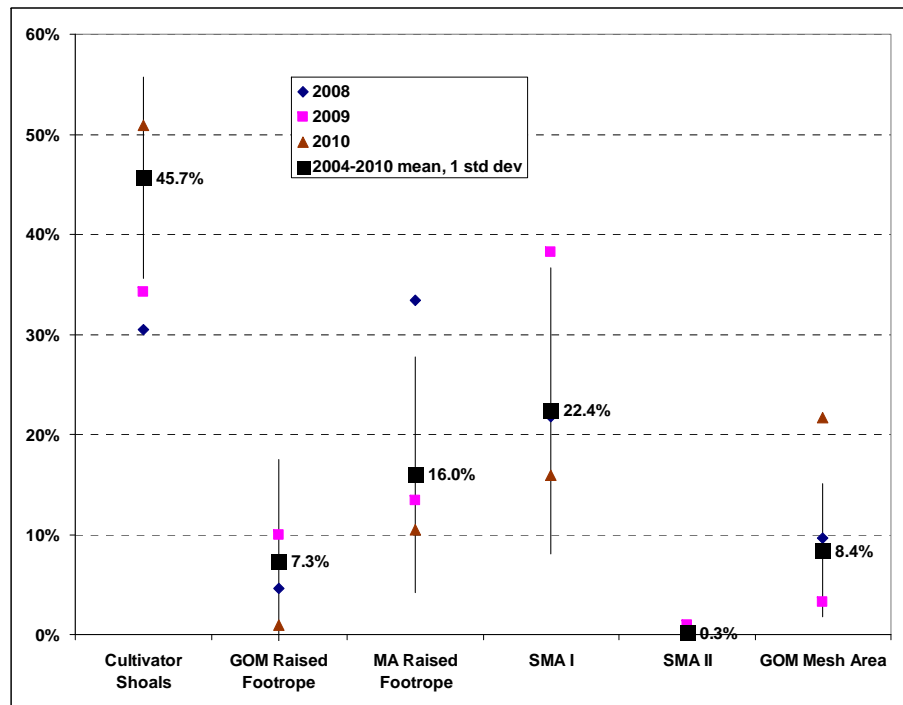
The analysis below estimates the average proportion of landings by management area during 2004-2010, plus and minus one standard deviation. Also presented are the annual proportions by area for 2008, 2009 and 2010.

### **Red hake**

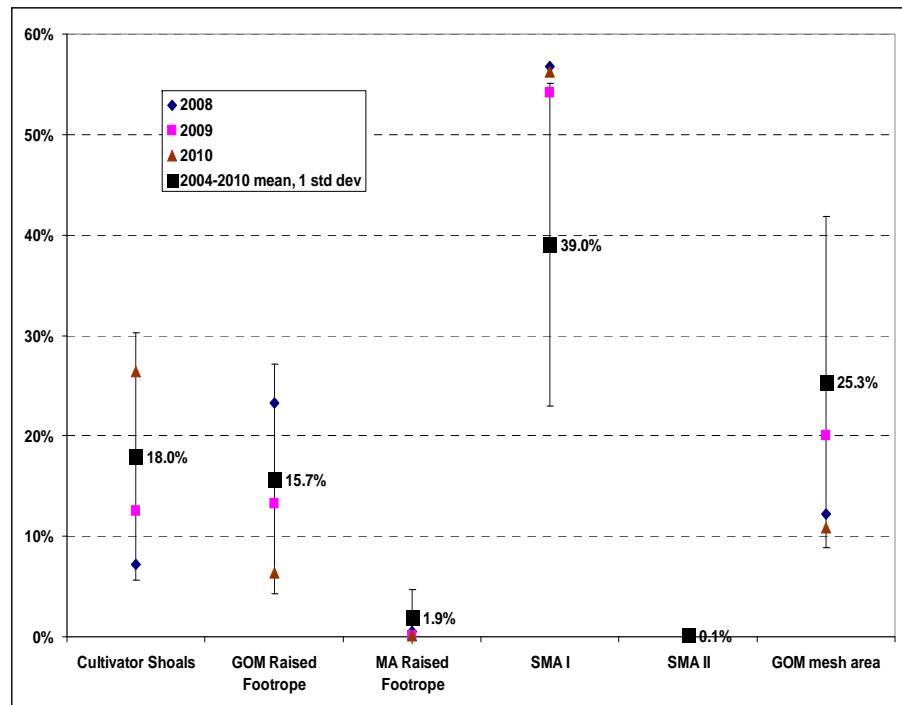
Depending on the data source, the average proportion of northern red hake landings in the Cultivator Shoals Area ranges from 18 to 45.7%. Cultivator Shoals Area landings in 2010 were higher than average (see figure below). The area with the next highest average proportion of landings was Small Mesh Area I, ranging from 22.4 to 39%. According to the VTRs, red hake landings from this area were over 50% of the northern stock area from 2008-2010 and well over the 2004-2010 mean. Data derived from dealer reports (SAFIS) were high only during 2010, the difference possibly coming from bait landings which are not reported by dealers. The average proportion of landings from the GOM exemption area in general ranged from 8.4 to 25.3%.

**Figure 2.** Proportion of northern stock red hake landings by management area from 2004-2010. “GOM Mesh Area” is the Gulf of Maine Exemption Area and includes landings by trips using large mesh trawls and other gears.

**Dealer/SAFIS trips**



**Vessel trip reports**



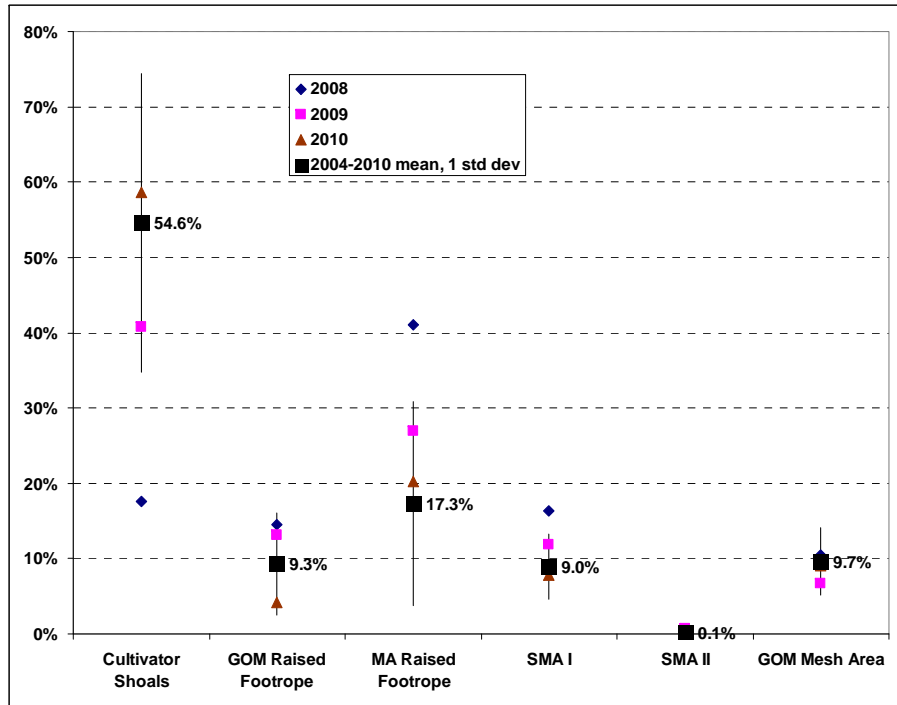
## **Silver hake**

The proportion of northern silver hake landings by management area was more consistent across data sets than for northern red hake. This greater consistency appears to occur because a greater proportion of total landings are reported by dealers, because a lower proportion are transferred at sea as bait.

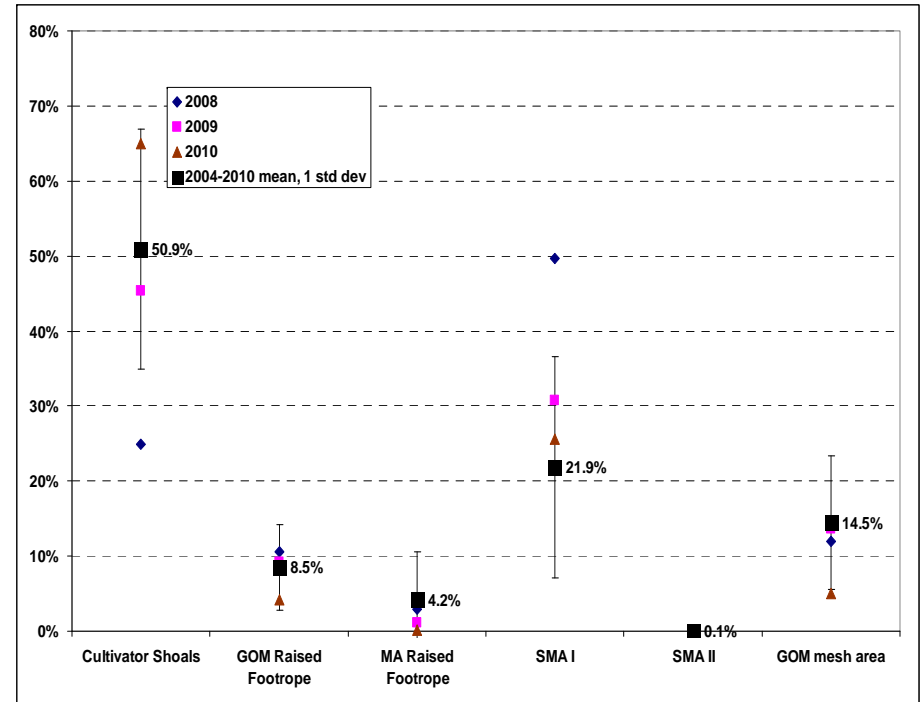
Depending on the data source, the average proportion of northern silver hake landings in the Cultivator Shoals Area ranges from 50.9 to 54.6%. Cultivator Shoals Area landings in 2010 were higher than average (see figure below). The area with the next highest proportion of landings was Small Mesh Area I, ranging from 9 to 21.9%. According to the VTRs, silver hake landings from this area were over 20% of the northern stock area from 2008-2010 and well over the 2004-2010 mean (again probably from transfers at sea not being reported by dealers). However, data derived from dealer reports (SAFIS) were high only during 2008 and 2009. The proportion of landings from the GOM exemption area in general ranged from 9.7 to 14.5%.

**Figure 3.** Proportion of northern stock silver hake landings by management area from 2004-2010. “GOM Mesh Area” is the Gulf of Maine Exemption Area and includes landings by trips using large mesh trawls and other gears.

**Dealer/SAFIS trips**



**Vessel trip reports**





## **Southern stock area**

Landings from the southern stock area were assigned to fishing year quarters (3 month periods beginning May 1) according to the reported date of landing. Slight differences may occur between the two data sets because the landings on dealer data are often the date of unloading or settlement, whereas on the VTRs the date represents arrival in port. All landings were assigned to quarter, regardless of gear type or mesh and would be monitored in that way. Reported landings of silver hake and offshore hake were combined for this analysis, consistent with the proposed monitoring method for a combined southern stock area TAL.

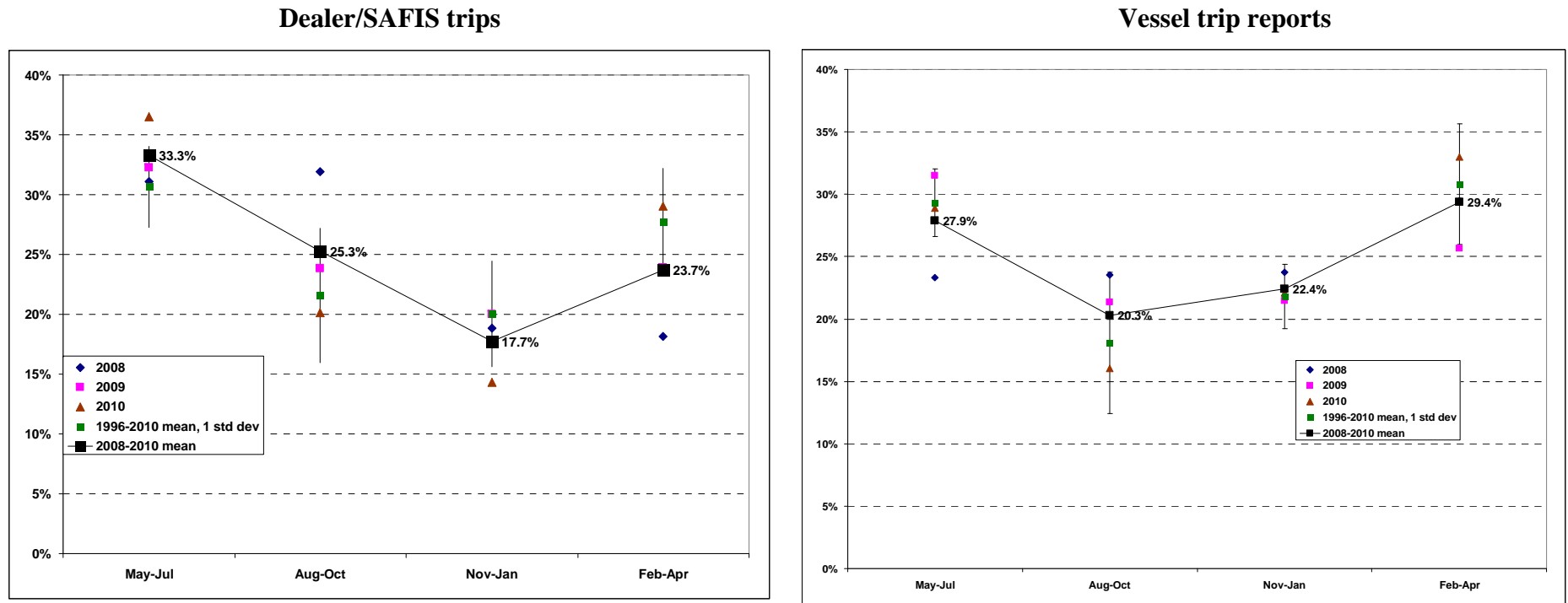
In the analysis presented below, the 2008-2010 average proportions are estimated and compared with the annual proportions for 2008, 2009, and 2010, as well as the mean and standard deviation ( $\pm 1$  stdev.) for 1996-2010 (the range of consistently available data).

## **Red hake**

The proportion of landings by quarter derived from the two data sources show similar trends, although the 2008-2010 means are slightly different. Most of the southern red hake landings occur in the late winter to early summer (see figure below). The proportion of landings in quarter 1 ranged from 27.9 to 33.3%. Quarter 4 had the next highest average proportion of red hake landings, ranging from 23.7 to 29.4%. Landings were generally lower in the fall and early winter.

The seasonal pattern was anomalous in 2008, however. Landings were higher than average in the late summer and fall (quarters 2 and 3), and consequently lower than average in quarters 1 and 4. This difference in the seasonal pattern was consistent across both data sets.

**Figure 4.** Proportion of southern stock red hake landings by management area from 2004-2010.

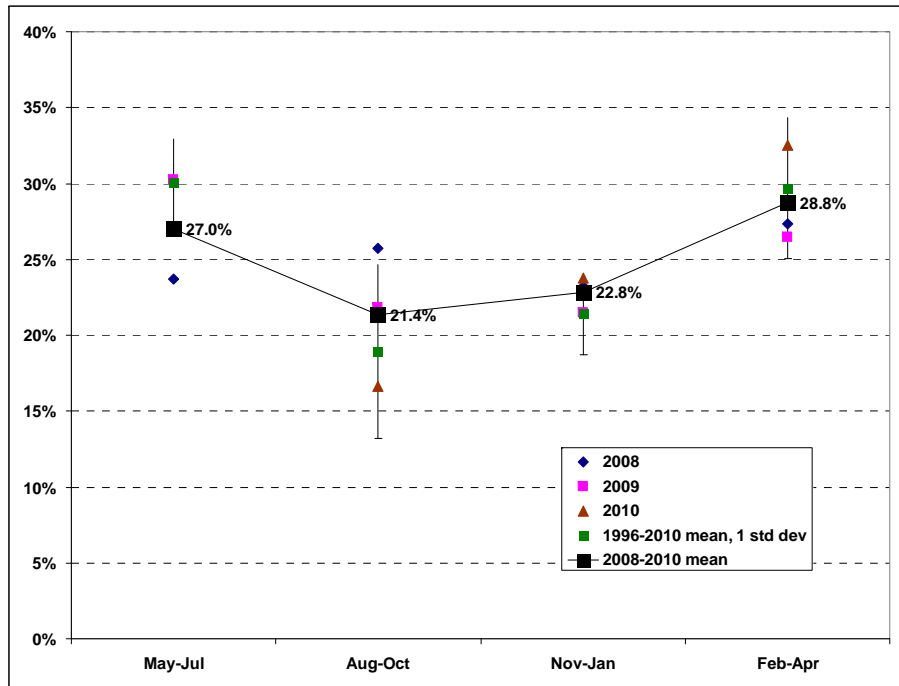


## **Silver and offshore hake**

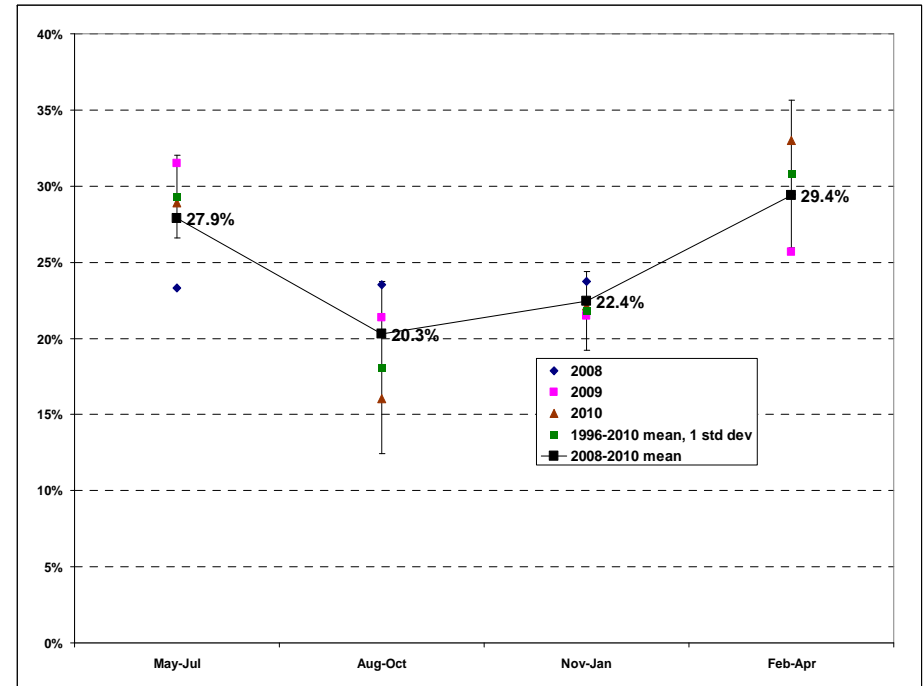
Silver and offshore hake landings are also highest in the late winter to early summer (fishing year quarters 1 and 4), a trend consistent in both sources of landings data. Averaged over 2008-2010, the mean proportions ranged from 27 to 27.9% in quarter 1 and 28.8 to 29.4% in quarter 4 (see figure below). Although not as dramatic as for red hake, the trend was also inconsistent in 2008, when landings were higher than normal during the Aug-Oct quarter and consequently lower in the May-Jul quarter. Fuel prices, weather patterns, regulations, and availability of fish could have contributed to the 2008 pattern. Conversely, 2010 landings were lower than normal in the Aug-Oct quarter and consequently higher in the Feb-Apr quarter.

**Figure 5.** Proportion of southern stock silver and offshore hake landings by management area from 2004-2010.

**Dealer/SAFIS trips**



**Vessel trip reports**



## Conclusions

While allocations by management area or quarter can ensure more consistent and equitable access to the resource, there are some concerns. One is that sub-allocations increase complexity and monitoring costs. The other is that variations in resource availability or fishing costs can be difficult to accommodate and could cause pre-mature closures (under/over harvest of TALs) when the ultimate goal is to prevent the stock area ACL from being exceeded.

The data suggest a potential range of sub-allocations (see table below) of the red and silver hake TALs, which the Council may take out to public hearing as a range for TAL sub-allocations. The Council may want to consider broadening the range to accommodate variations, but ultimately the allocation proportions need to add up to 100% for the fishing year. Rollovers of unused TAL may be an acceptable tradeoff if the landings during early quarters don't meet TALs which are a little above historic norms. The data in this report provides the Council with information to aid in the selection of the most appropriate course of action.

Although the proposed annual TALs are higher than recent landings, it is possible that an area or quarterly allocation based on mean annual proportions could trigger in-season accountability measures (AM) for overages. In either the northern area allocations or the southern quarterly allocations, under harvest will be added to and overages will be deducted from other allocations that occur later in the fishing year.

Possession limits would be reduced to the incidental level when landings reach the TAL trigger and overages would be deducted from later small mesh exemption areas or quarterly allocations in that fishing year. Under harvest in the Cultivator Shoals Area would be added to the allocations for the other small mesh exemption areas and would be added to quarter 3 or 4 allocations in the southern stock area.

As an example using northern area red hake allocations derived from VTR data, 18% of the TAL would be allocated to the Cultivator Shoals Area, or 42,925 lbs. Since 66,425 lbs. were landed in 2010, the excess 23,500 lbs. would be deducted from the 135,504 lbs. (56.7%) allocation for the small mesh exemption areas, leaving 112,004 lbs. Since 2010 landings reported from these small mesh exemption areas were 157,849, there would be a 45,845 lbs. overage. These overages may not occur at all, however, because the in-season accountability measure would reduce the possession limit to an incidental level when landings reached 90% of these TAL area allocations. To some extent, these overages might be offset by lower landings in the Gulf of Maine Regulated Mesh Exemption Area. The TAL allocation in this area would be 25.3% or 60,552 lbs. and in 2010 only 27,219 lbs. were landed, underharvesting the TAL by 33,333 lbs.

As an example using southern area silver hake allocations derived from dealer data, landings in the first quarter 2008 were 23.7% which is lower than the 27% average for 2008-2010 average. In this case, the rollover provision would allocate the remaining 3.3% to the third quarter, increasing that allocation from 22.8 to 26.1% of the annual TAL. In the second quarter (Aug-Oct), the landings were 25.7% of the 2008 landings, higher than the 21.4% allocation. In this case, the 4.3% overage (if it occurred with an incidental limit being triggered) would be deducted from the 28.8% TAL allocation for the fourth (Feb-Apr) quarter. The third quarter (Nov-Jan) landings were 23.2% of 2008 landings, lower than the revised 26.1%. The

underharvest of 2.9% would be added to the revised 24.5% fourth quarter allocation, increasing it to 27.4% of the annual TAL. But since the absolute value of the TAL allocations are expected to be over 3.5 times the 2010 landings, this scenario is unlikely in the near future and is only presented as an example of how the quarterly allocation and adjustments would work according to the alternative developed by the Oversight Committee and Advisory Panel.

**Table 2.** Historic proportions of red, silver, and offshore hake landings by stock area. Average proportions were estimated for the northern stock area over 2004-2010 to represent the time period since the establishment of small mesh exemption areas. Average proportions were estimated for the southern stock area over 2008-2010 to represent recent fishery performance.

|                                   |        | <b>Cultivator Shoals Area</b> | <b>Small mesh exempted areas</b> | <b>Gulf of Maine exemption area</b> |                |
|-----------------------------------|--------|-------------------------------|----------------------------------|-------------------------------------|----------------|
| Northern red hake                 | Dealer | 45.7%                         | 45.9%                            | 8.4%                                |                |
|                                   | VTR    | 18.0%                         | 56.7%                            | 25.3%                               |                |
| Northern silver hake              | Dealer | 54.6%                         | 35.7%                            | 9.7%                                |                |
|                                   | VTR    | 50.9%                         | 34.6%                            | 14.5%                               |                |
|                                   |        | <b>May-Jul</b>                | <b>Aug-Oct</b>                   | <b>Nov-Jan</b>                      | <b>Feb-Apr</b> |
| Southern red hake                 | Dealer | 33.3%                         | 25.3%                            | 17.7%                               | 23.7%          |
|                                   | VTR    | 27.9%                         | 20.3%                            | 22.4%                               | 29.4%          |
| Southern silver and offshore hake | Dealer | 27.0%                         | 21.4%                            | 22.8%                               | 28.8%          |
|                                   | VTR    | 27.9%                         | 20.3%                            | 22.4%                               | 29.4%          |

Although dealer reports are the official source of landings data and will be used to monitor the Total Allowable Landings (TALs). Reports for 2004-2010 include a significant amount of landings in VTRs that do not appear in dealer data, primarily from reported transfers at sea for bait (see figure below). To account for transfers at sea for bait, the PDT recommends using the VTR to allocate TAL by management area in the northern stock area. The dealer data will be the primary source of information to monitor the TAL, but will be supplemented by reported transfers at sea from weekly VTRs submitted by fishermen.

In the southern area, the 2008-2010 landings from both data sources are more consistent, because there are fewer transfers at sea reported in the southern area. The PDT recommends using the dealer data to make quarterly TAL allocations, because doing so will be more consistent with how the data will be monitored.

**Figure 6.** Reported dealer landings (blue) and transfers at sea (red) of red hake (top) and silver hake (bottom) from statistical areas in the northern stock area.

