Industry Funded Scallop Transplanting Update:

In 2020, research funded through donations from the fishing industry evaluated the use of bottom trawls for moving large volumes of sea scallops. We found that a two-panel box net was the most effective design for transplanting sea scallops. This net design transplanted 76% of the 550,338 sea scallops. These sea scallops were transplanted from the Nantucket Lightship South-Deep (NLS-Deep) to an area very low ambient sea scallop densities and closed to fishing (**Figure 1 and 2**). Within two weeks of the transplanting trips, a detailed HabCam survey was conducted at the site where the sea scallops were transplanted. In the images, we observed significantly higher densities of sea scallops nearest the transplant site (**Figure 3**). We surveyed the transplant site again in 2021 and found that the density in the transplant site had decreased (**Figure 4**).

While no sea scallops were tagged during the 2020 project, an analysis of the HabCam images provides confidence that the sea scallops observed in 2021 were the sea scallops transplanted in 2020. Intuitively, the 2020 post-transplanting density should increase with decreasing proximity to the drop locations. Between HabCam surveys, the transplanted sea scallops will have dispersed from the drop locations and the net density nearest the drop locations will decrease and increase further away from the drop locations. This pattern is observed when sea scallop densities in the 2020 images are compared to densities in nearest 2021 images (**Figures 5 and 6**). Confident that we were observing the transplanted sea scallops in the 2020 and 2021 images, we evaluated the shell height data to investigate growth. Relative to the sea scallops within the NLS-Deep, the sea scallops within the transplant site were larger (**Table 1 and Figure 7**). Based on the observed changes in shell height, the yield of the transplanted sea scallops has almost doubled and suggests that transplanting sea scallops from the NLS-Deep to shallower regions may improve the yield of these sea scallops (**Table 2**).

Additional sea scallop transplanting and tagging was planned before the 2021 HabCam survey but, we were not able to obtain an Exempted Fishing Permit (EFP) in time. Once we obtained the EFP in October 2021, a trip using the two-panel box net was conducted in November to deploy 3,000 of 10,000 tags that were purchased while waiting for the permit. During this trip, a single tow was made in the transplant site to collect shell height data and tag 1,500 sea scallops from the site. We then tagged 1,500 sea scallops from the NLS-Deep and transplanted an additional 350 bushels onto the site. More tags will be deployed in the upcoming months to improve the certainty about observed changes in sea scallop growth and density within the transplant site.

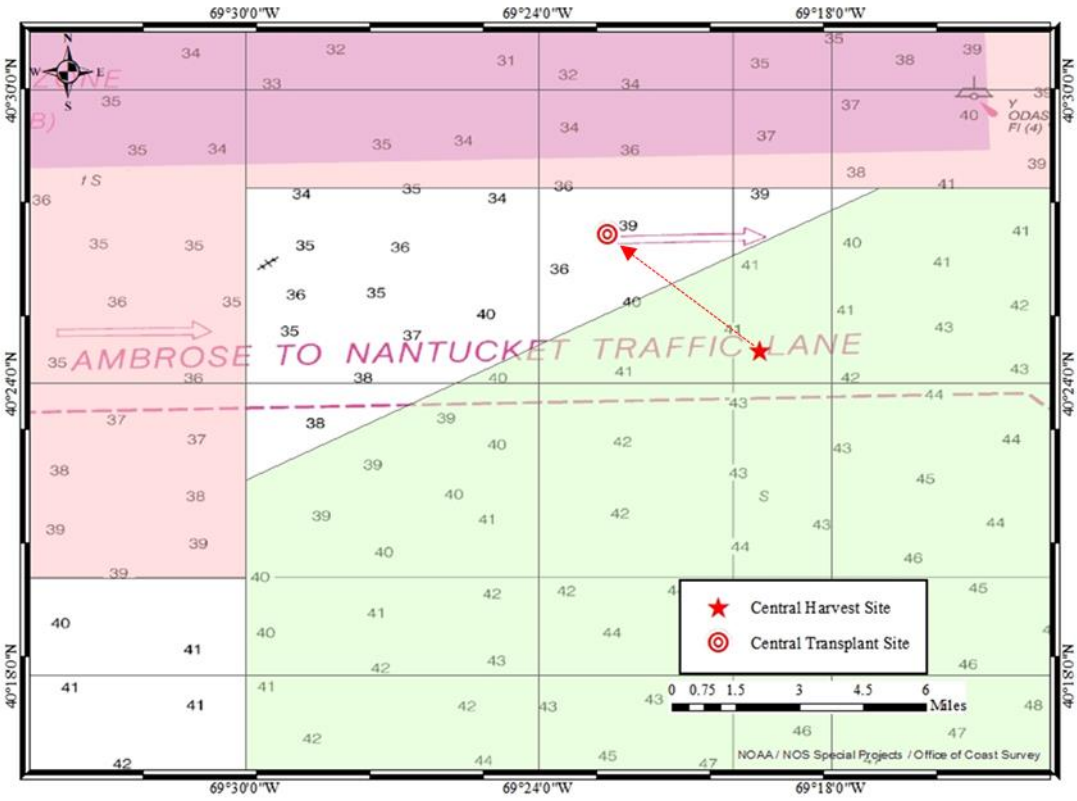

Figure 1: Map of the Harvest and Transplant Sites

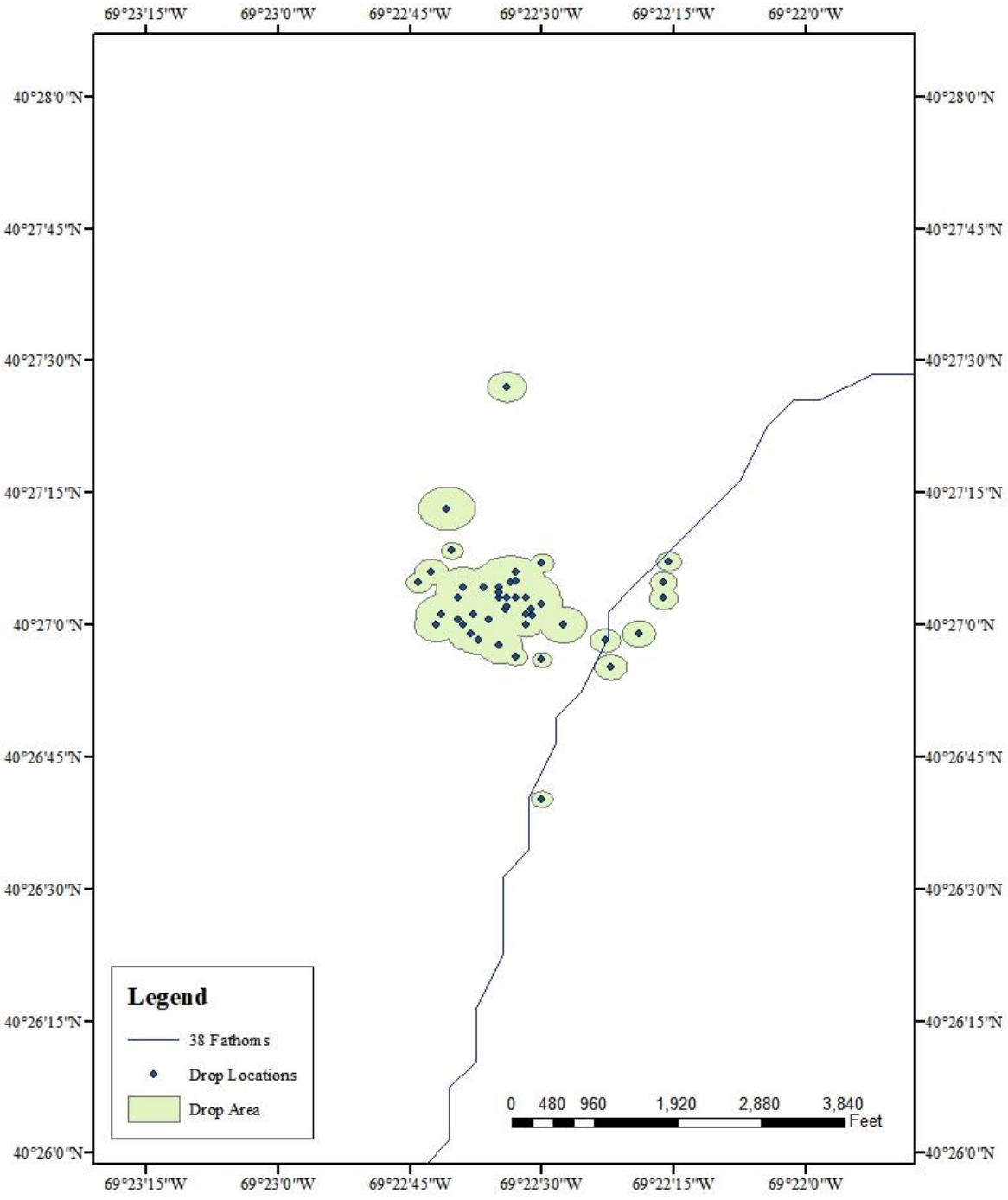

Figure 2: Location and approximate area occupied by the transplanted sea scallops.

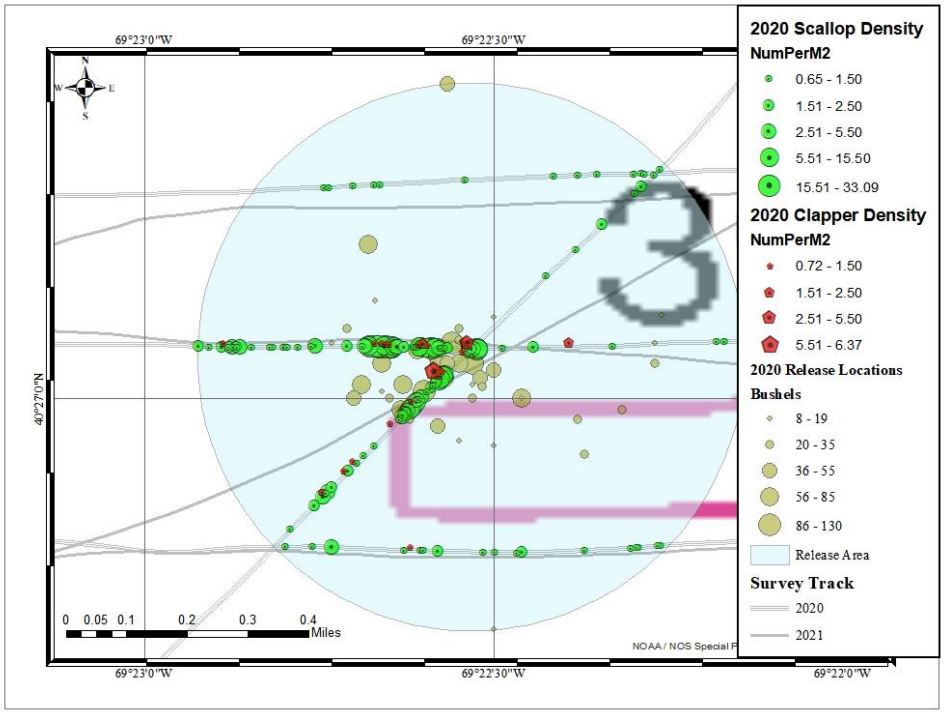

Figure 3: Sea scallop density within the transplant site observed in the 2020 HabCam images.

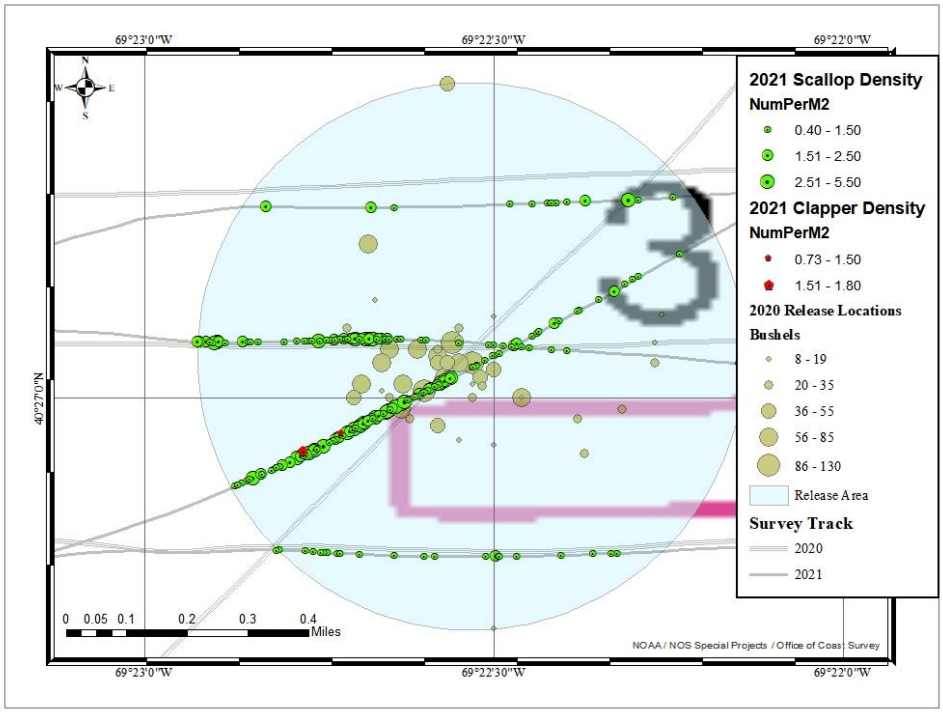

Figure 4: Sea scallop density within the transplant site observed in the 2021 HabCam images.

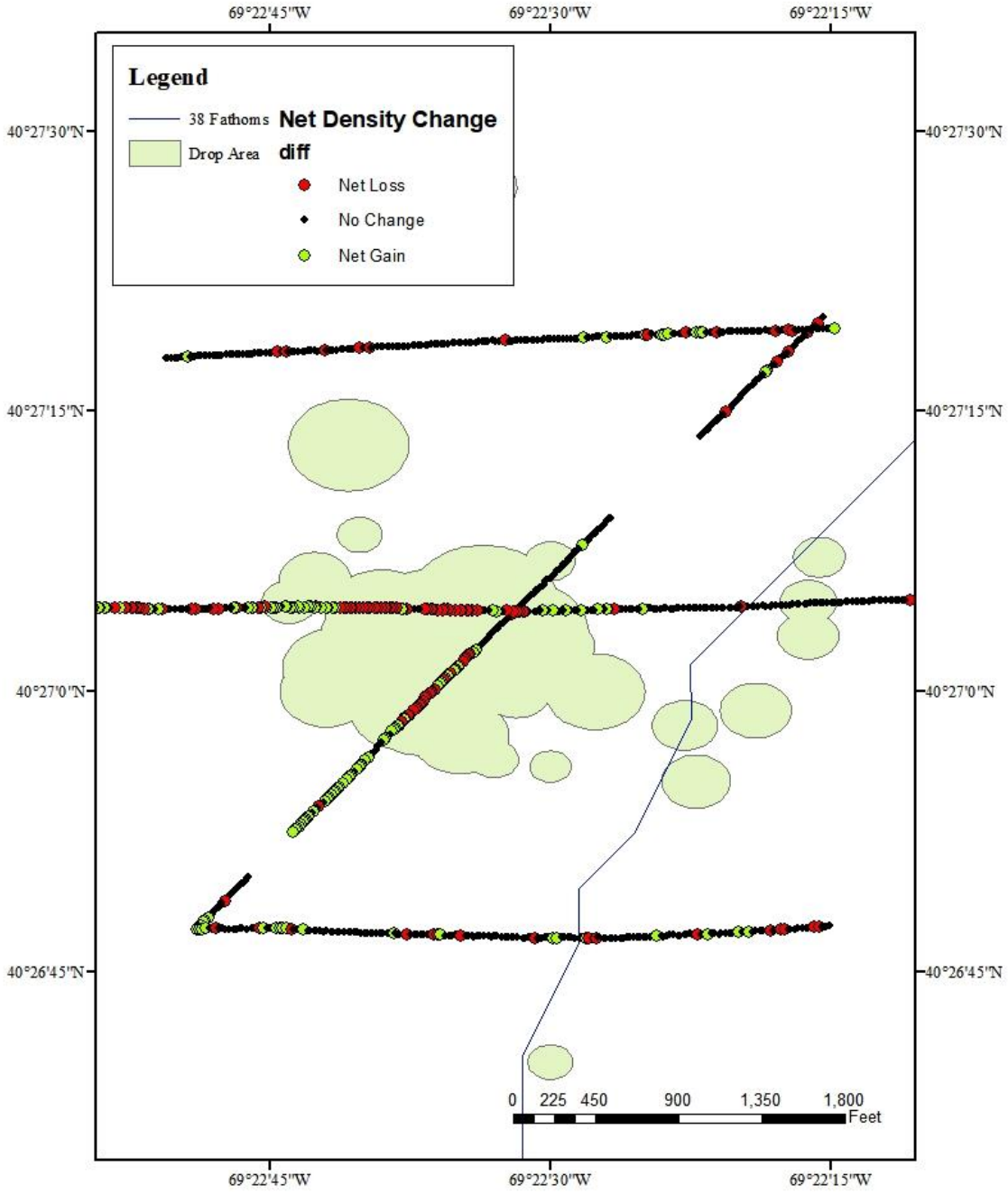

Figure 5: Relative change in density from 2020 to 2021 within the transplant site.

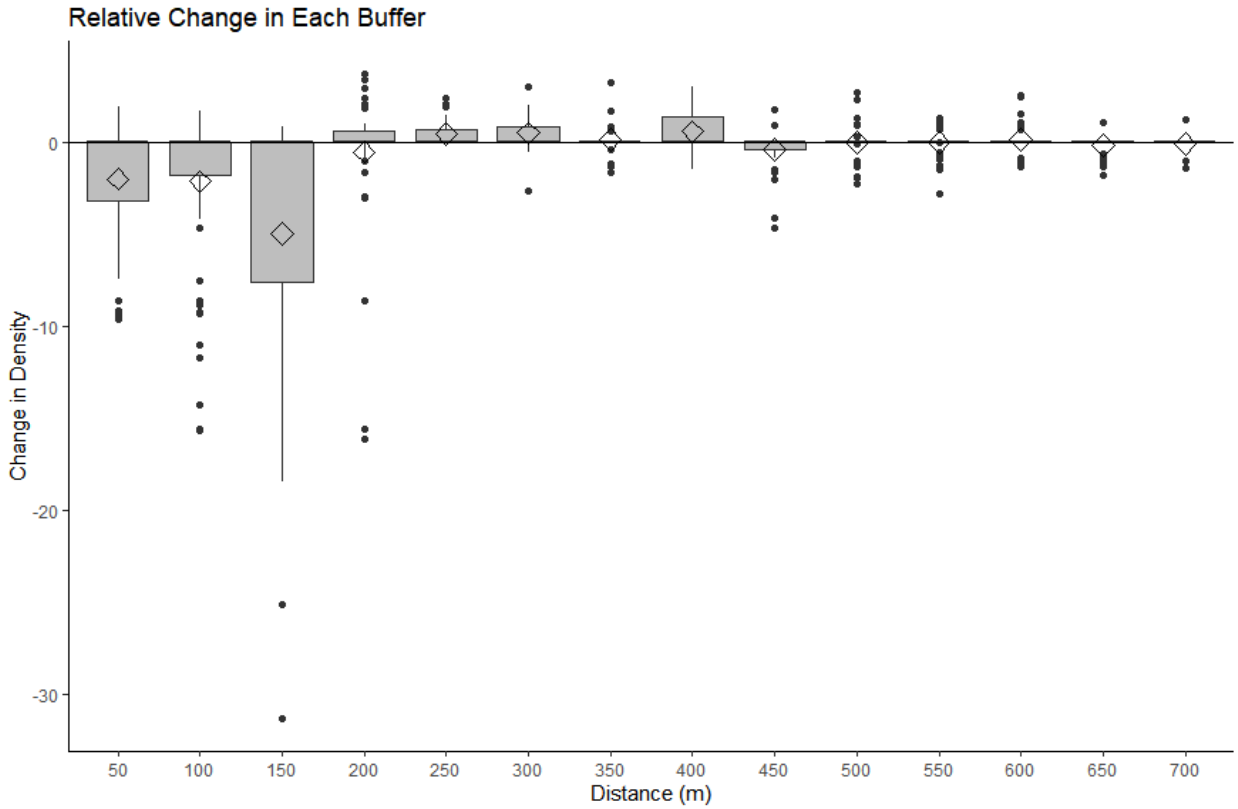

Figure 6: Relative in change in density by 50 meters intervals from the center of the transplant site.

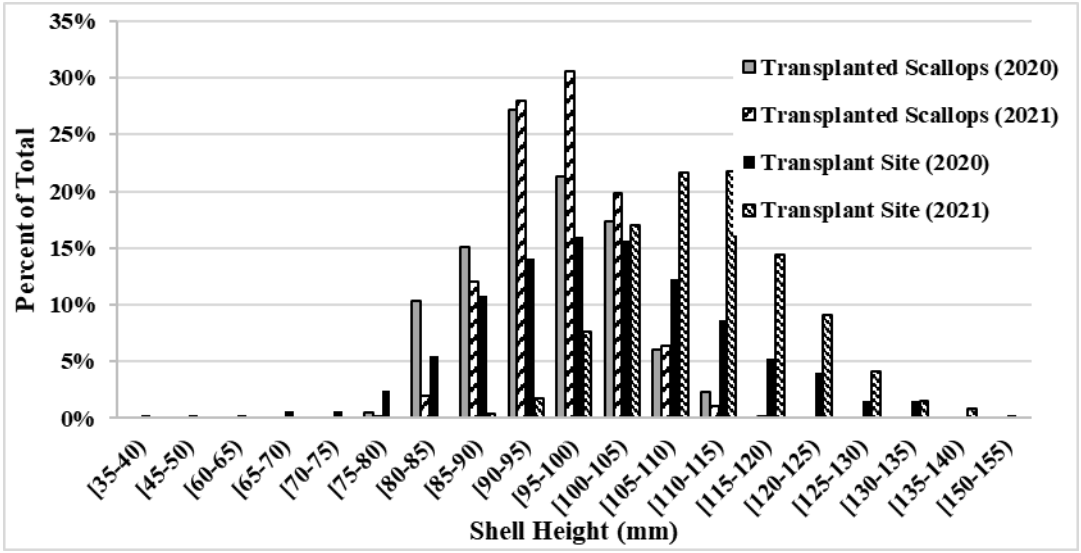

Figure 7: Sea scallop shell height distribution from the HabCam surveys and transplanting trips.

Table 1: Mean shell height observed in the transplant site and change in size between years.

	Avg. Shell Height (mm)	Date	Days After Release	% change
2020 Release	94.12	6/9/2020	0	
2021 HabCam	100.09	7/13/2021	400	6%
2021 Transplant Site	110.39	11/17/2021	515	10%

Table 2: Estimated change in meat yield based on observed growth within the transplant site.

	Harvest Site *Shell Height (mm)*	Harvest Site *Meat Count*	Transplant Site *Shell Height (mm)*	Transplant Site *Meat Count*
2020	94.12	~36	94.12	~36
2021	95.96	~33	110.39	~17
% change	2%		17%	