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An Update of Results of Tagging Experiments with Juvenile
Yellowtail Flounder in NAFO Divisions 3LNO

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Abstract

This study updates previous work by Morgan and Walsh (MS 1996) on tagging experiments conducted on yellowtail flounder (*Pleuronectes ferruginea*) on the southern Grand Bank. Yellowtail flounder were recaptured a greater distance from their release position the longer they were at large. However, after more than 8 years at liberty they had travelled only 83.6 ± 4.0 nmi. This indicates that the fish are relatively sedentary. Returns from the 1998 Canadian commercial fishery indicate that the fishery occurred mainly in two relatively small areas.

Introduction

Yellowtail flounder (*Pleuronectes ferruginea*) were tagged and released on the Grand Bank during 1990 to 1993 in a study described by Morgan and Walsh (MS 1996). This study concluded that juvenile yellowtail flounder were relatively sedentary with low transport rates out of the nursery area on the southern Grand Bank. This confirmed earlier work that also indicated limited movement by this species (Walsh, MS 1987).

The Div. 3LNO stock of yellowtail flounder was placed under moratorium in 1994, which limited tag returns after that time. However, in 1998 the fishery was reopened. This study updates the previous report on tagging experiments (Morgan and Walsh, MS 1996) with information from additional returns, including those recaptured in the 1998 fishery.

Materials and Methods

Yellowtail flounder were tagged and released in the area of the tail of the Grand Bank in NAFO Div. 3LNO during four research vessel trips from 1990 to 1993. Fish were captured using a Yankee 41 shrimp trawl which was towed for 15 minutes at a speed of 2.5 knots. Fish were placed in holding tanks and then tagged and total length measured. Only fish between 15 and 35 cm were tagged so that mainly juveniles were released. Any fish with excessive bruising or scale loss were not tagged. The fish were returned to a holding tank after tagging and held until the release position was reached. There were 9 release positions, 6 inside Canada's 200 mile limit and 3 outside the 200 mile limit. The release positions as well as the number of fish released are given in Table 1 the positions are also shown in Figure 1. Only the releases of Petersen discs are shown. In 1990, 132 fish were also tagged with operculum dangler tags but none of these fish were returned. A total of 9379 fish with Petersen discs were released, 6861 inside of the 200 mile limit and 2518 outside of the 200 mile limit.

When tags were returned the return information was entered into a data base and a \$20 reward sent to the person returning the tag. From this information, return position, days free, distance and direction travelled were calculated. Return positions were plotted for each release position separately, for fish returned up to 1 year

following release, from 1 to 2 years following release, from 2 to 3 years following release and for more than 3 years following release. Return positions were also plotted for fish recaptured during the 1998 fishery. The distance from recapture position to release position was examined for fish recaptured following different numbers of years free.

Results and Discussion

Since the last report, 25 additional tags have been returned, 13 from the 1998 Canadian fishery. To date there have been no returns from the non-Canadian fishery in 1998. A total of 265 tags have been returned or 2.8% of the number released. For all returns, the average number of days free was 554.4 ± 40.0 (mean \pm std. err.) and the average distance travelled was 32.0 ± 1.7 nmi. This is compared to the earlier report where the average was 384.8 ± 22.5 days free and 29.0 ± 1.6 nmi travelled. Fish recaptured during the 1998 fishery had been free for an average of 2501.8 ± 112.3 days (6.9 years) and had travelled 70.9 ± 6.1 nmi. The longest distance travelled was 122 nmi and the longest number of days free was 3017 (8.3 years).

Figure 2 shows the return positions for each of the nine release positions. Since the last report there have been returns from release positions 3, 4, 5, 6, 8 and 9. These returns tend to be in the same general area as those reported previously but at a greater distance from the release position.

Returns of yellowtail flounder recaptured from different periods after release are shown in Figure 3. The fish clearly show a tendency to spread out from the release area over time. An ANOVA shows a significant effect of number of years at liberty on distance of recapture position from release position ($F=16.13$, $df=7,219$, $p<0.0001$). The average distances travelled for different periods at large are shown in Figure 4. Tukey's multiple comparisons showed that fish were recaptured a greater distance from their release position when recaptured from all time periods greater than 1 year following release than when recaptured less than one year following release. Fish recaptured 8 or more years following release were recaptured at a greater distance than those recaptured 0-1, 1-2 and 2-3 years following release. Despite this significant increase in distance travelled with time, fish recaptured 8 years after release were returned from an average of only 83.6 ± 4.0 nmi from their release position. This is in accordance with Morgan and Walsh (MS 1996) who concluded that yellowtail flounder were relatively sedentary. It also confirms the conclusion of Walsh (1992) that yellowtail flounder disperse somewhat as they become older.

The location of returns was most frequently in a direction west, northwest and north of the release positions, although fish were returned from every compass direction and a large number had travelled in an easterly direction (Fig. 5). These results are very similar to those of Morgan and Walsh (MS 1996). The biggest difference is in an increased number of fish recaptured north of their release position. Many of these fish were recaptured during the 1998 fishery.

The positions of fish recaptured during the 1998 fishery are shown in Figure 6. The 13 fish came from 2 relatively small areas. These results are consistent with reports of the fishing industry that they restricted their fishery to a small area to minimise American plaice (*Hippoglossoides platessoides*) bycatch (Kulka, MS 1999).

Acknowledgements

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References

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Table 1. Release positions and number fish released and returned for juvenile yellowtail flounder tagged from 1990 to 1993.

Position	Latitude °N	Longitude °W	Releases	Returns
1	4345	5125	13	2
2	4331	5047	108	10
3	4404	5030	1894	4
4	4340	5104	253	38
5	4400	5025	2537	83
6	4353	5040	1304	29
7	4344	4952	1409	26
8	4340	5030	1001	17
9	4353	5050	860	16
Total			9379	265

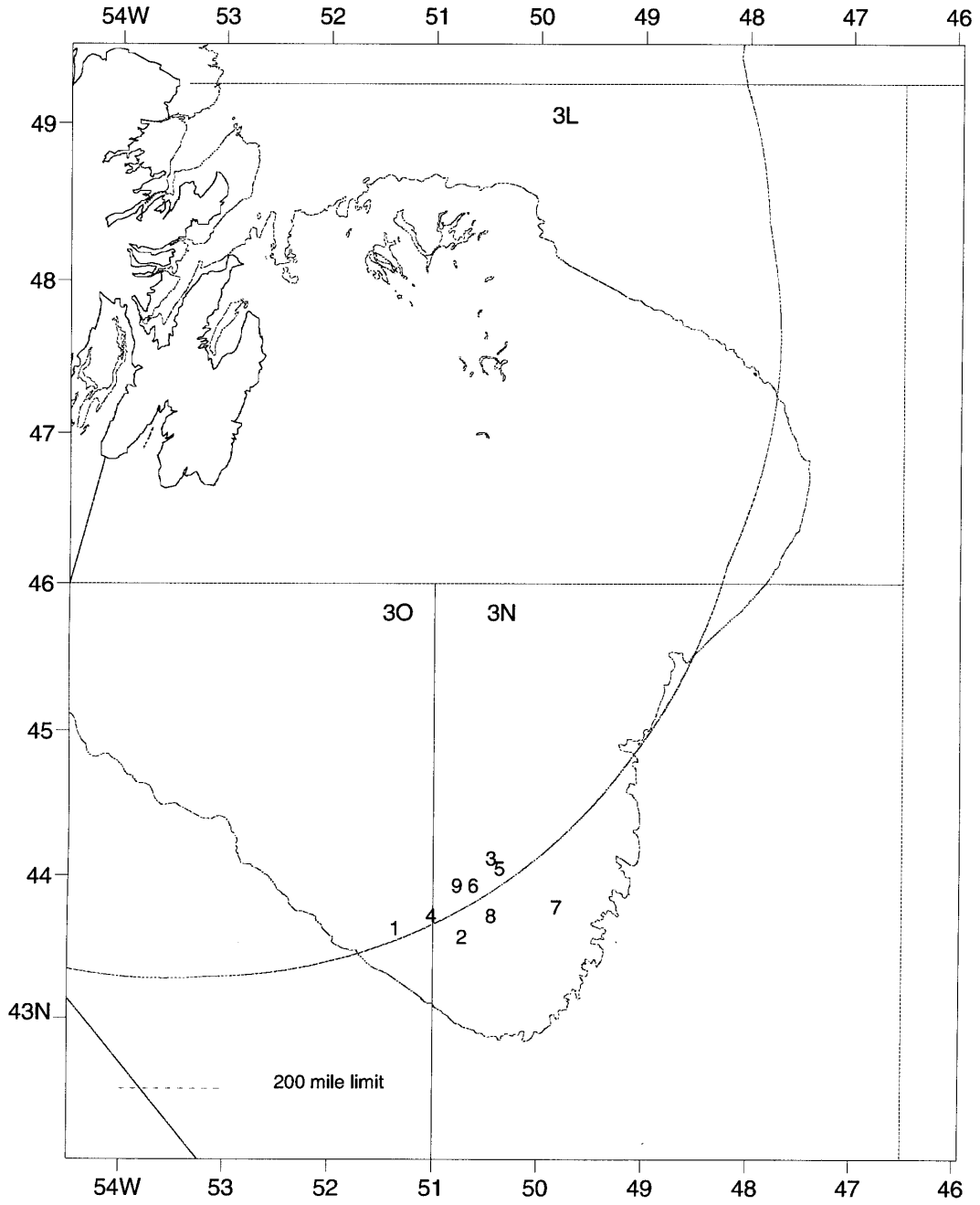


Figure 1. Release positions of juvenile yellowtail flounder.

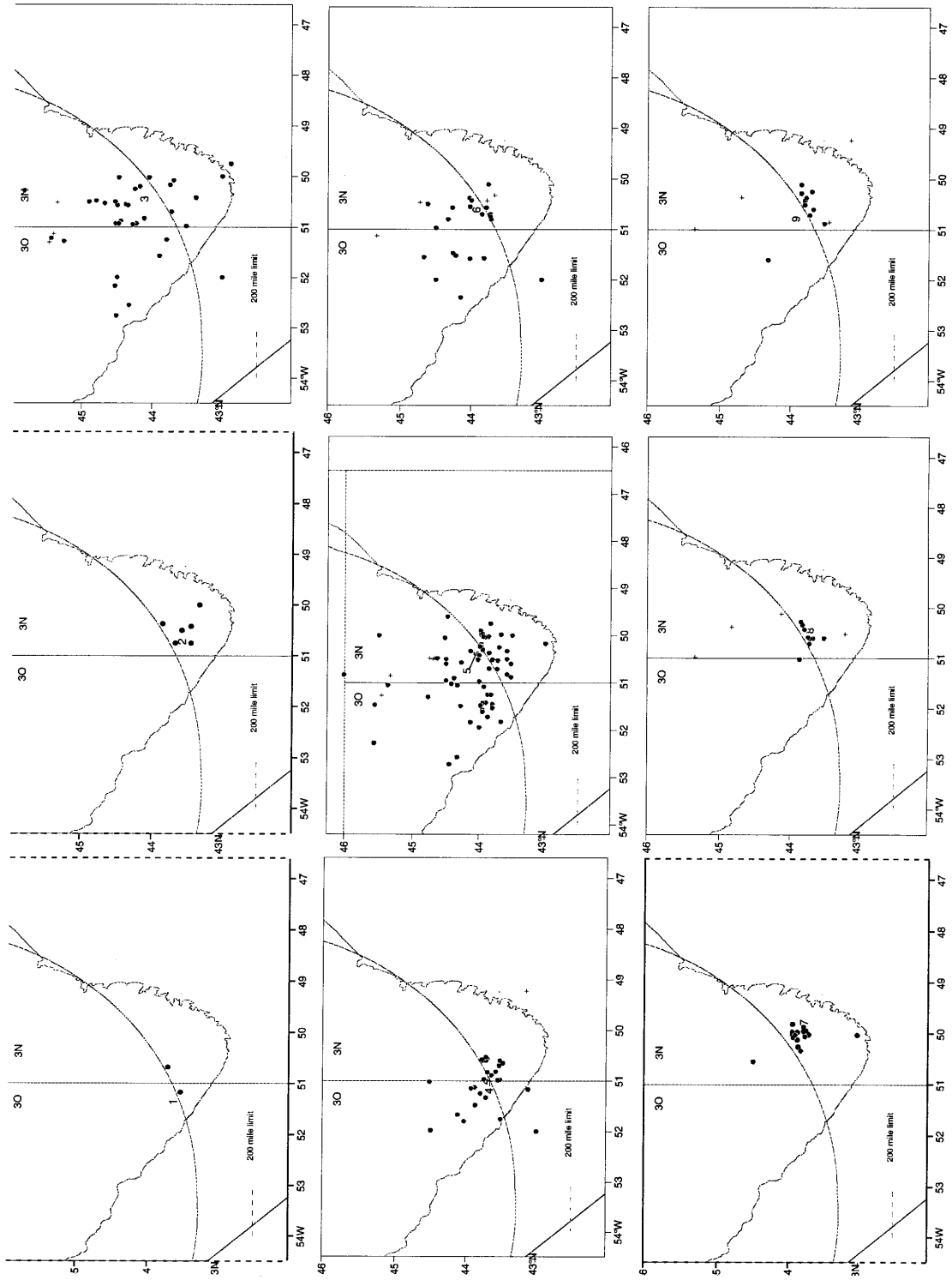


Figure 2. Returns of juvenile yellowtail flounder from each of nine release positions. Crosses indicate returns since the last report.

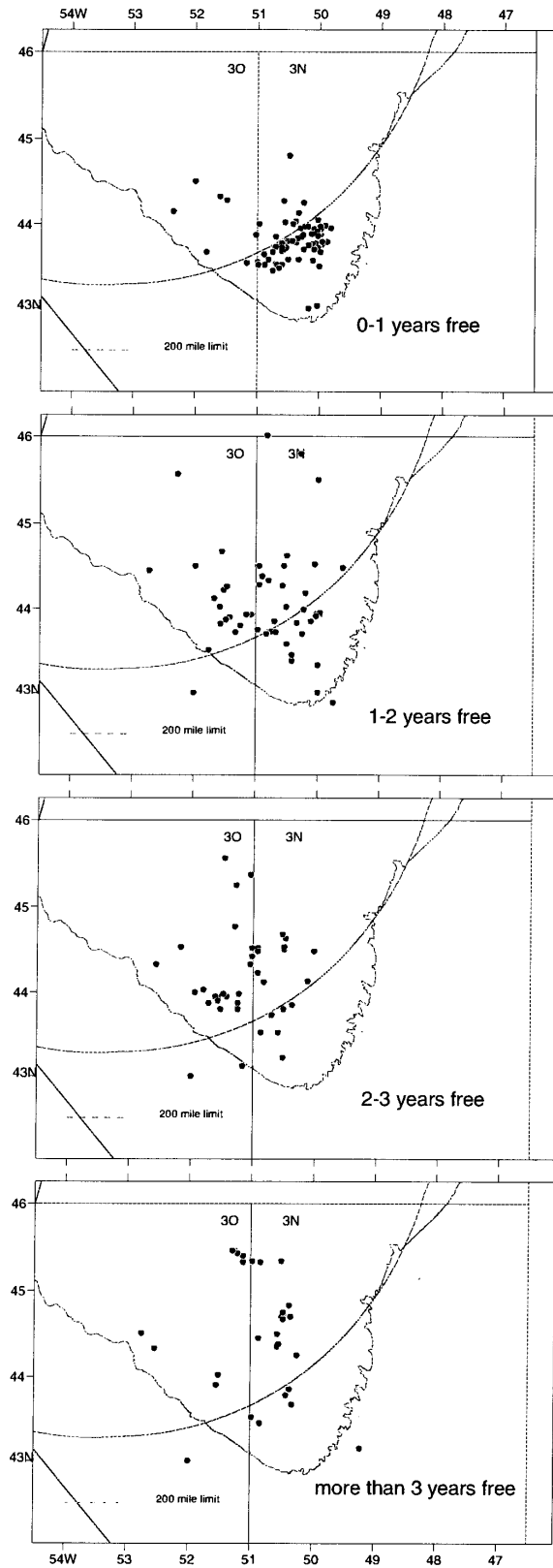


Figure 3. Returns of juvenile yellowtail from different periods after release.

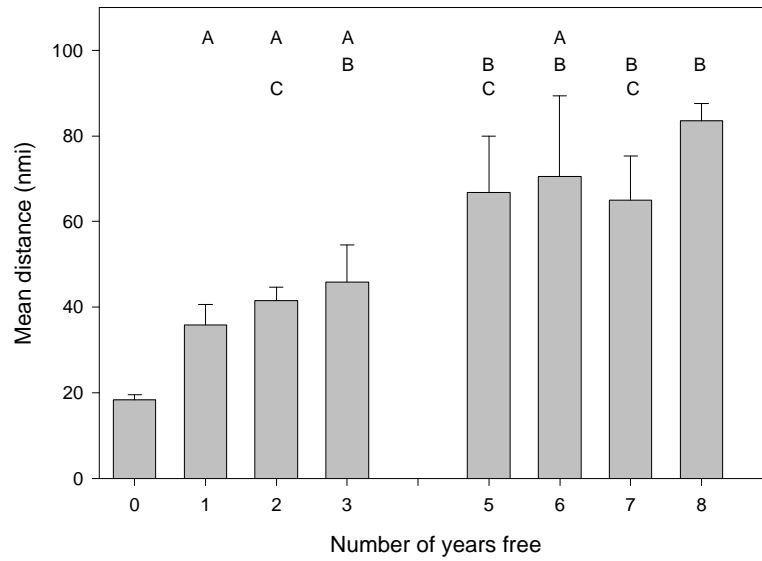


Figure 4. Mean distance (nautical miles) of recapture position versus number of years free. Years with the same letter are not significantly different.

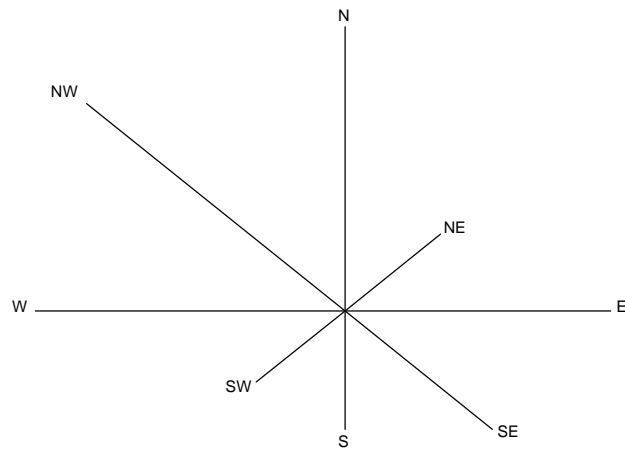


Figure 5. Frequency of direction of recapture position relative to release position for juvenile yellowtail. Direction is relative to true north. Length of an arm indicates the frequency.

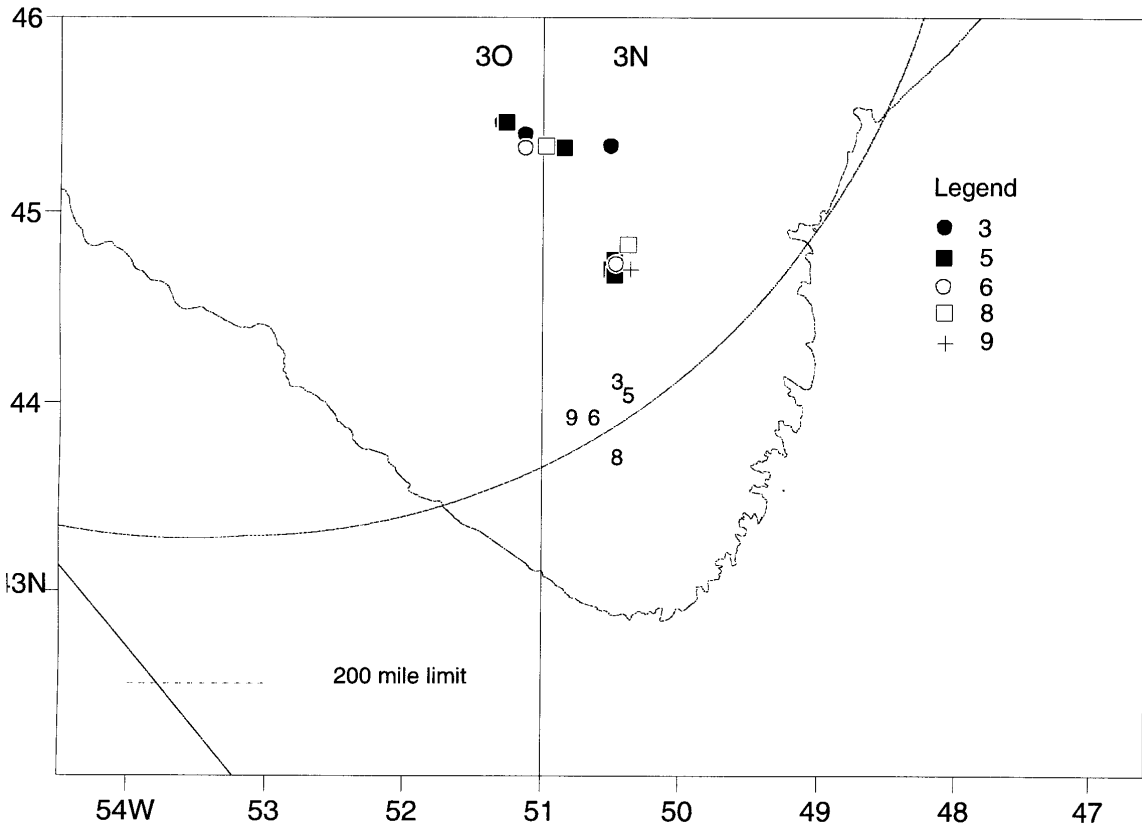


Figure 6. Return positions for yellowtail tags recaptured in the 1998 commercial fishery. The symbols indicate the return positions and the numbers give the locations of the release positions. The legend shows which symbol corresponds to each release position.