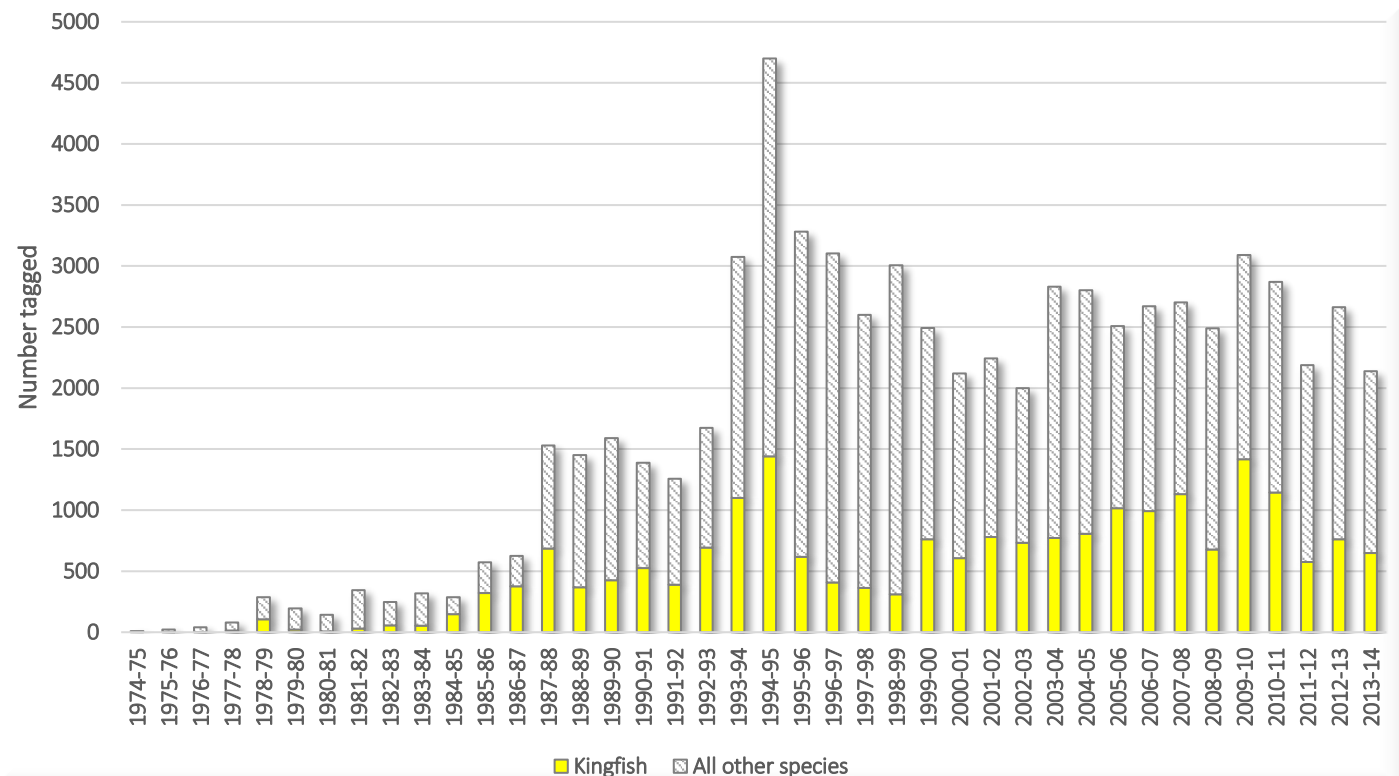


Synthesis of New Zealand Gamefish Tagging Data, 1975 to 2014.

Yellowtail kingfish (*Seriola lalandi*.)

- The New Zealand Gamefish Tagging Programme (NZGTP) was introduced as a multi species gamefish tagging programme to study the seasonal and short-term movements of gamefish species of importance to New Zealand fisheries. While the intention was to tag billfish, it was accepted that a variety of gamefish species would be tagged.
- To date, the Gamefish Tagging Programme has tagged and released 68,775 billfish, pelagic sharks, tuna and kingfish in the New Zealand EEZ over the last 40 years. 31% of all game fish tagged and released over this period were kingfish.
- A total of 2,166 recaptures comprising 20 species have been recorded since 1975. 69% of all recorded recaptures have been kingfish.
- The pattern of kingfish tagging success relates to fishing effort in any given year. Initially, the number of fish tagged increased steadily, peaking in 1994/5 at 1,441. Tagging then sharply declined to just 310 during 1998/9. Subsequently kingfish tagging has been variable with an average of 904 fish tagged per year between 2004 and 2014, but ranging from 1,416 tagged in 2009/10 to just 575 in 2011/12.



Right: Number of game fish tagged and released by year 1974–2014. Yellowtail kingfish tag and release numbers are highlighted.

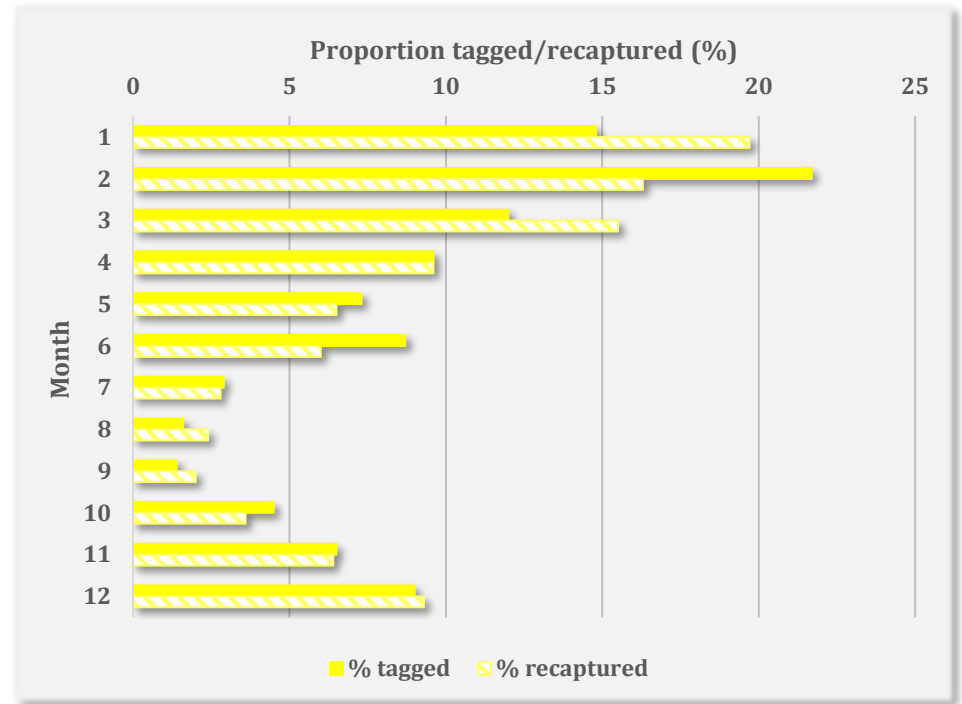
Gamefish tagging; single species reports.

Releases inside EEZ	Releases outside EEZ	Recaptures (all areas)	Recapture rate (%)	Maximum displacement (n. mile)	Maximum time at liberty (years.)
21,935	3	1,462	6.89	1,619	14.7

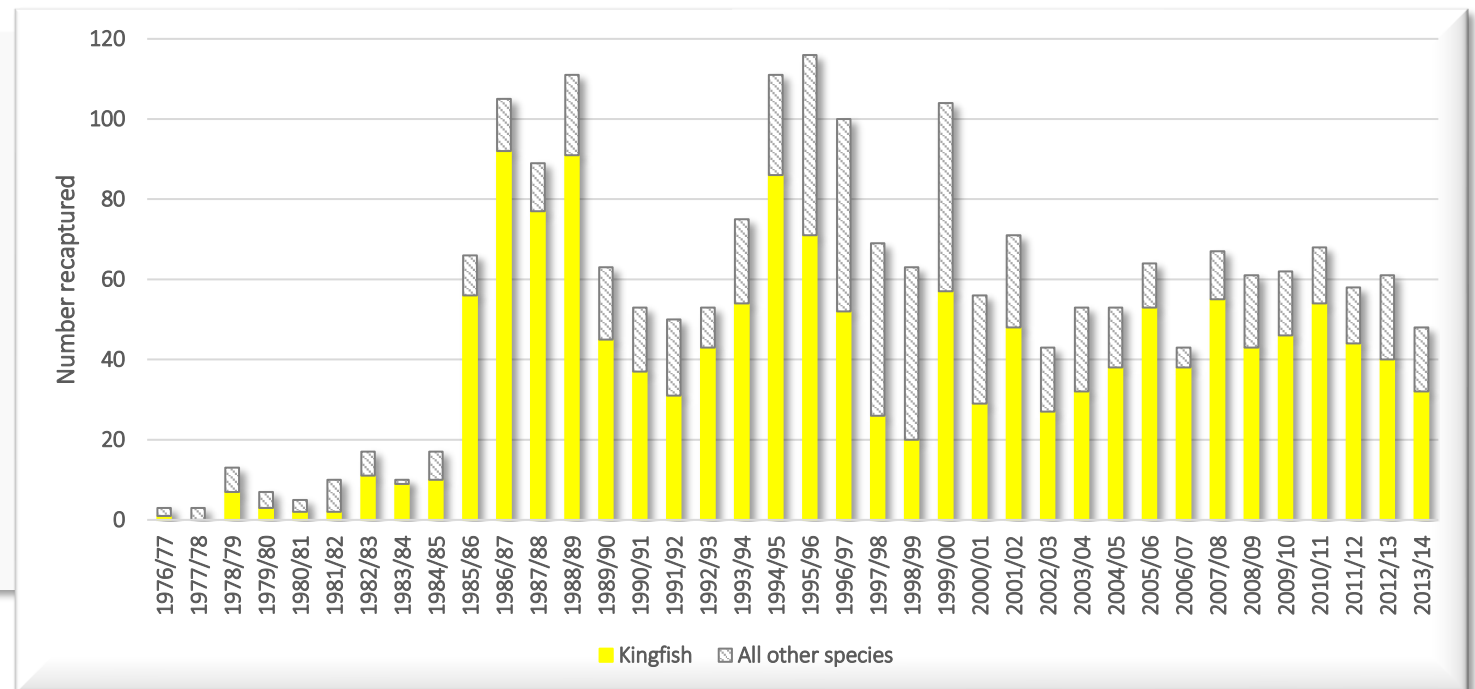
Above: Breakdown of kingfish tag/recapture data 1974-2014.

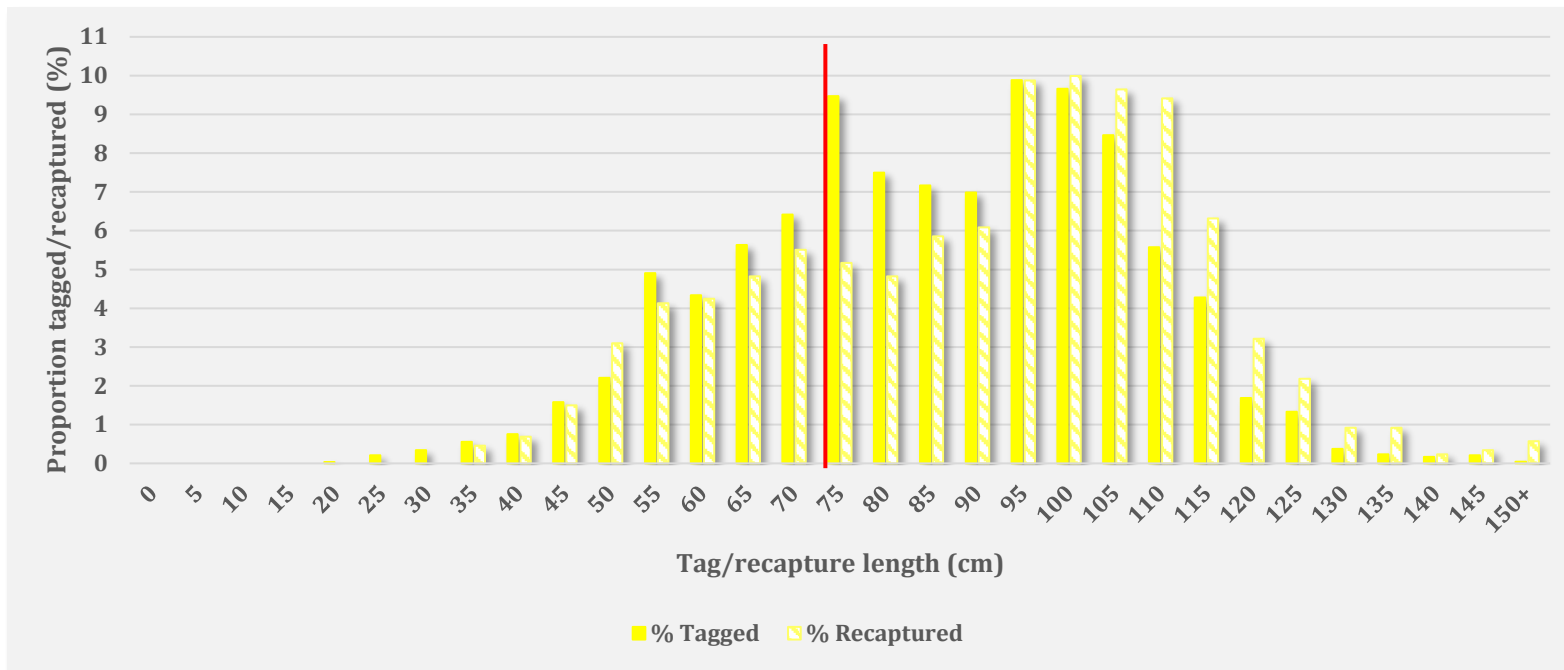
Right: Proportion of kingfish tagged and recaptured per month.

Below: Number of game fish recaptured by year 1975–2014. Yellowtail kingfish recapture numbers are highlighted.



- Relatively few kingfish were recaptured until the mid-1980's. A peak of 91 fish were recaptured in 1986/7 followed by another peak of 78 fish recaptured in 1994/5. Over the last decade recaptures have stabilised at around 42 fish per year.
- Fishing effort is generally lower during winter months which is reflected in the proportion of fish tagged or recaptured every month during the fishing year. Over a third of all kingfish are tagged during January and February. Over half of all kingfish recaptures occur during January, February and March each year.

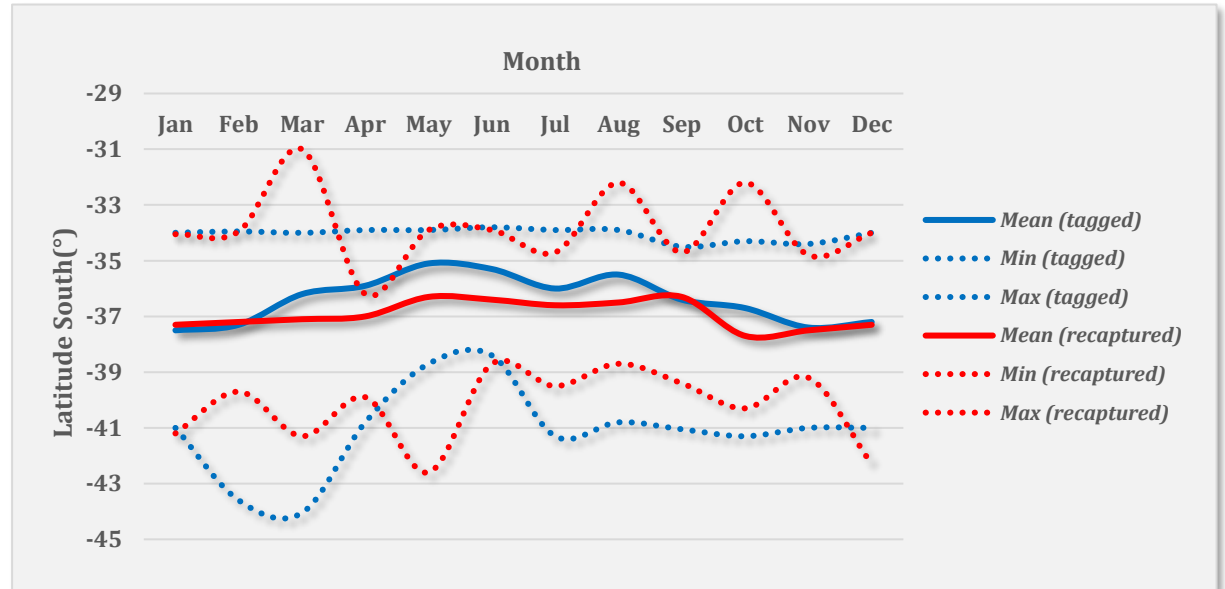


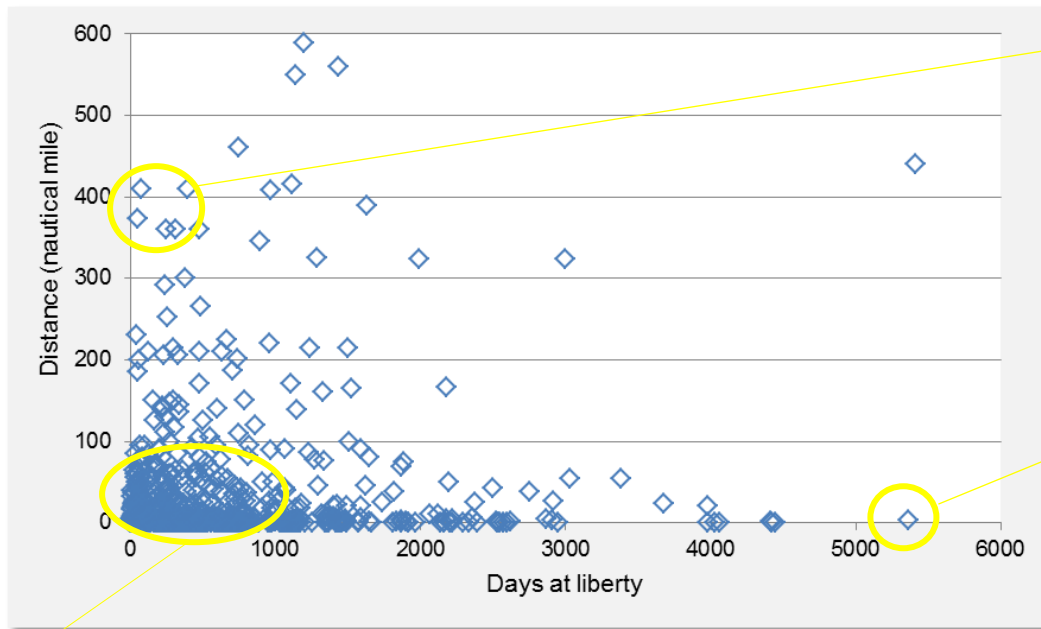


Left: proportion of kingfish tagged/recaptured by length. (the current minimum legal size (MLS) limit of 75cm is indicated).

Below: Kingfish tag/recaptures by latitude and month.

- Between 30 and 40% of kingfish tagged or recaptured were between 95 and 115 cm. A large proportion of kingfish tagged are less than the current Minimum Legal Size. This is because there was no MLS until 1993, when a 65 cm size limit was introduced, increasing to 75 cm in 2004. The great majority of small kingfish tagged relate to the period prior to 2004. Anglers are actively discouraged from tagging kingfish less than 75 cm, as this might encourage people to land under-sized fish bearing a tag.
- Individual kingfish have been tagged and recaptured over a broad geographical range in New Zealand; as far north as the Kermadec Islands (-31°S) and as far south as Oamaru (-44°S). Mean tag/recapture latitudes likely reflect patterns in fishing effort shifting north during winter where most kingfish tagging occurred in the Bay of Islands and south during summer where effort picks up in the Bay of Plenty.





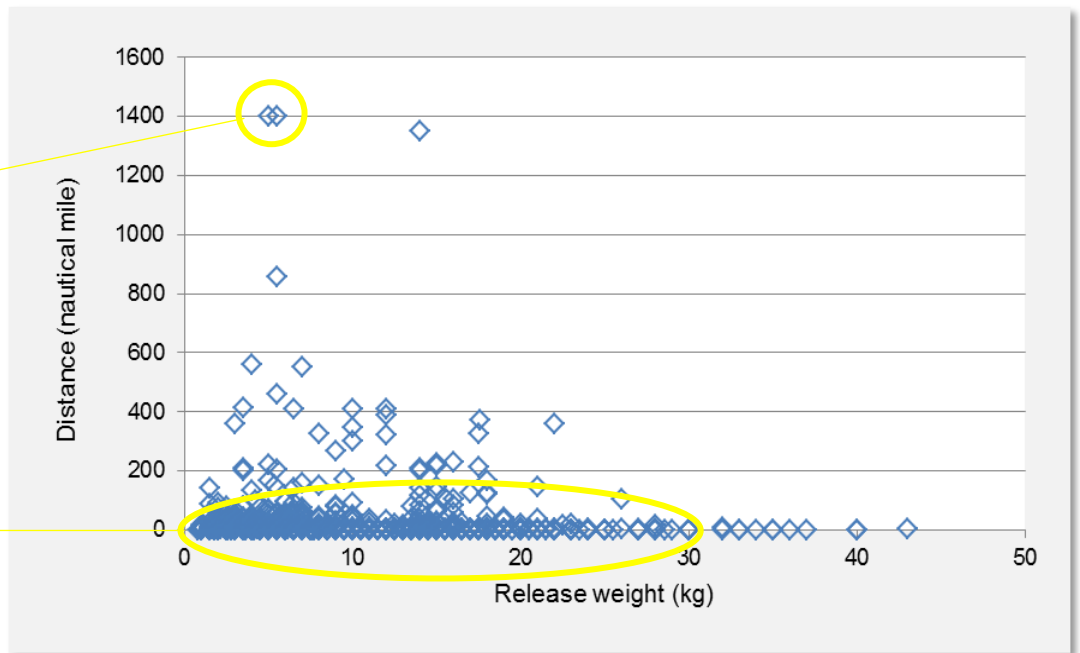
Kingfish are clearly capable of travelling significant distances over a relatively short period of time. These kingfish were recaptured less than a year after being tagged, having travelled 350-450 n.

There is some evidence to suggest kingfish (at least larger individuals) are essentially resident rather than migratory and can be long-lived. This kingfish was recaptured nearly fifteen years after and in virtually the same place as it was initially tagged.

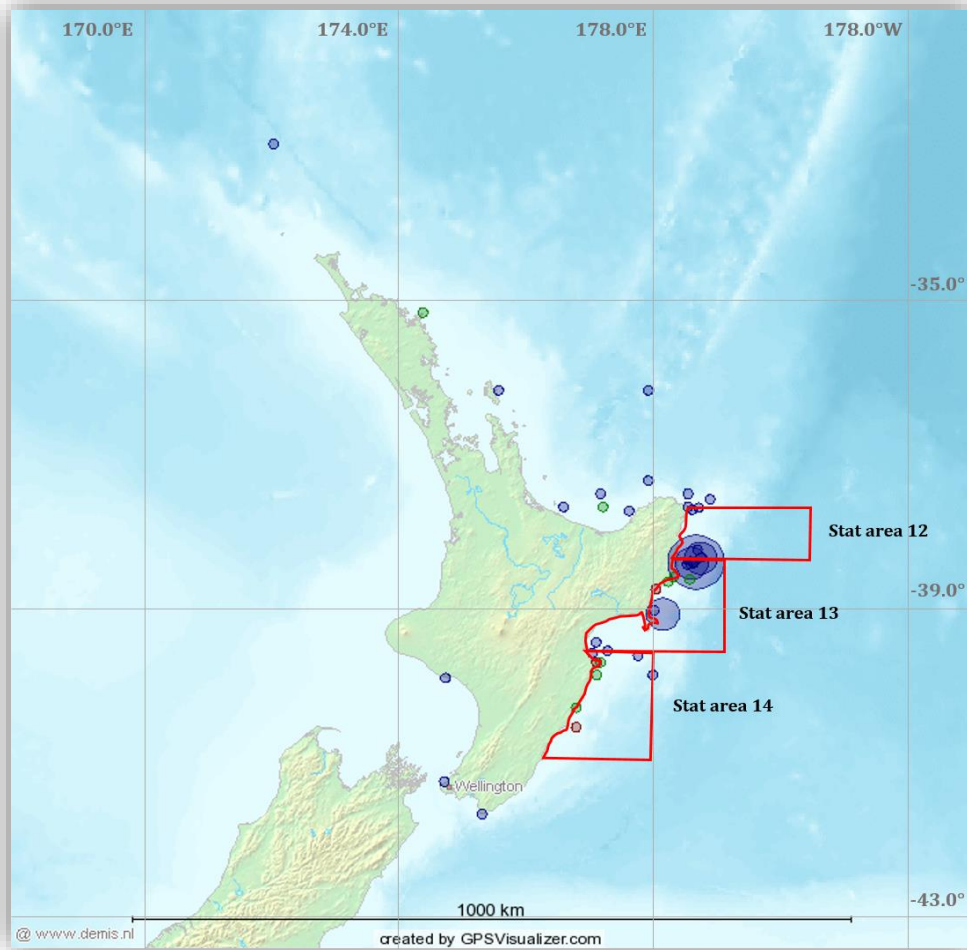
The majority of kingfish are recaptured within three years of being tagged and less than 100 n. miles from their original tag location.

Only smaller fish (mainly less than 10kg) appear to travel any great distances; probably in search of territory. Kingfish are evidently able to travel large distances when young.

The majority of kingfish appear to be resident, few are recaptured more than 100 n. miles from their tagging location. Larger kingfish (over 20kg) especially tend to remain in a single location.



Kingfish displacement by NZ fisheries statistical areas.

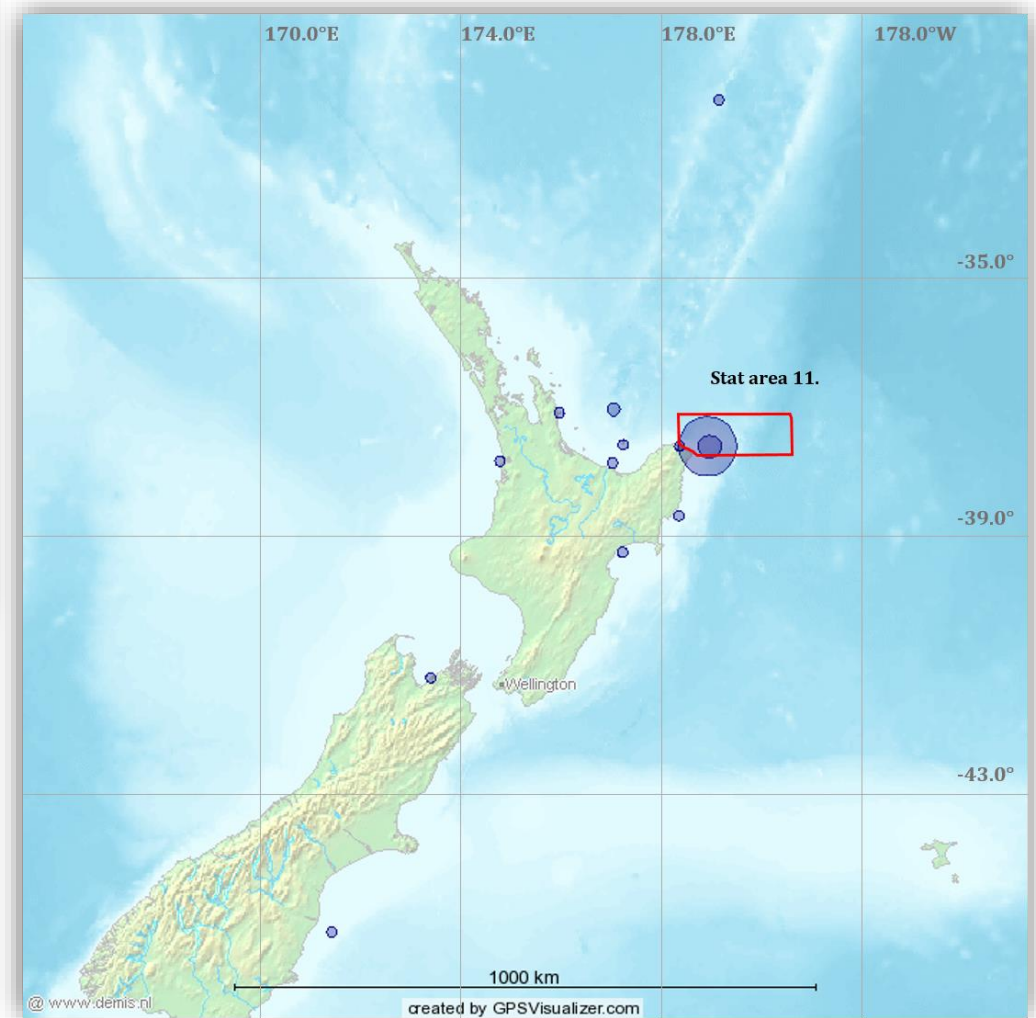


- Kingfish recaptures**
- Tagged in stat area 12: ●
 - Tagged in stat area 13: ●
 - Tagged in stat area 14: ●

Stat areas 12, 13 & 14. (Eastland, Hawke's Bay, Wairarapa.)

The majority of fish recaptured inside area 12 were at Tolaga Bay and Tokomaru Bay. Recaptures of fish tagged in area 12 were widespread ranging from Middlesex Bank off Cape Reinga to Cape Palliser in the South. 15 individuals; (42%) of fish tagged inside stat area 12 were recaptured in the same stat area.

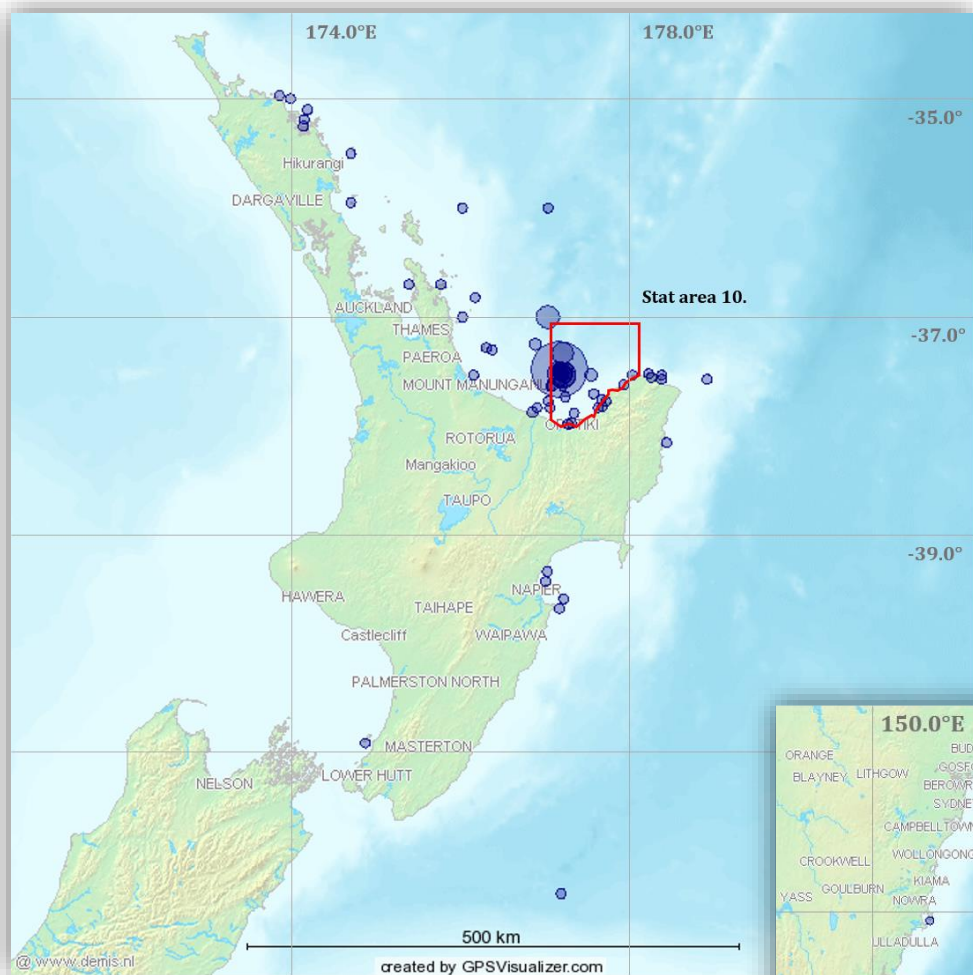
37% of fish recaptured inside stat area 13 were originally tagged there, although only 8 individuals have to date been recaptured from area 13 they appear to broadly remain along the East North Island coast, although, individuals have been recaptured in the Eastern Bay of Plenty and the Bay of Islands.



Stat area 11. (East Cape.)

27 individuals (71%) of fish tagged inside stat area 11 were recaptured at the same location. Virtually all were recaptured at Ranfurly Bank. Although those tagged and recaptured in area 11 appear to be largely resident, individuals have been re-caught in the Bay of Plenty and as far north as the Colville Ridge (32°S) and as far south as Oamaru (45°S).

Gamefish tagging; single species reports.

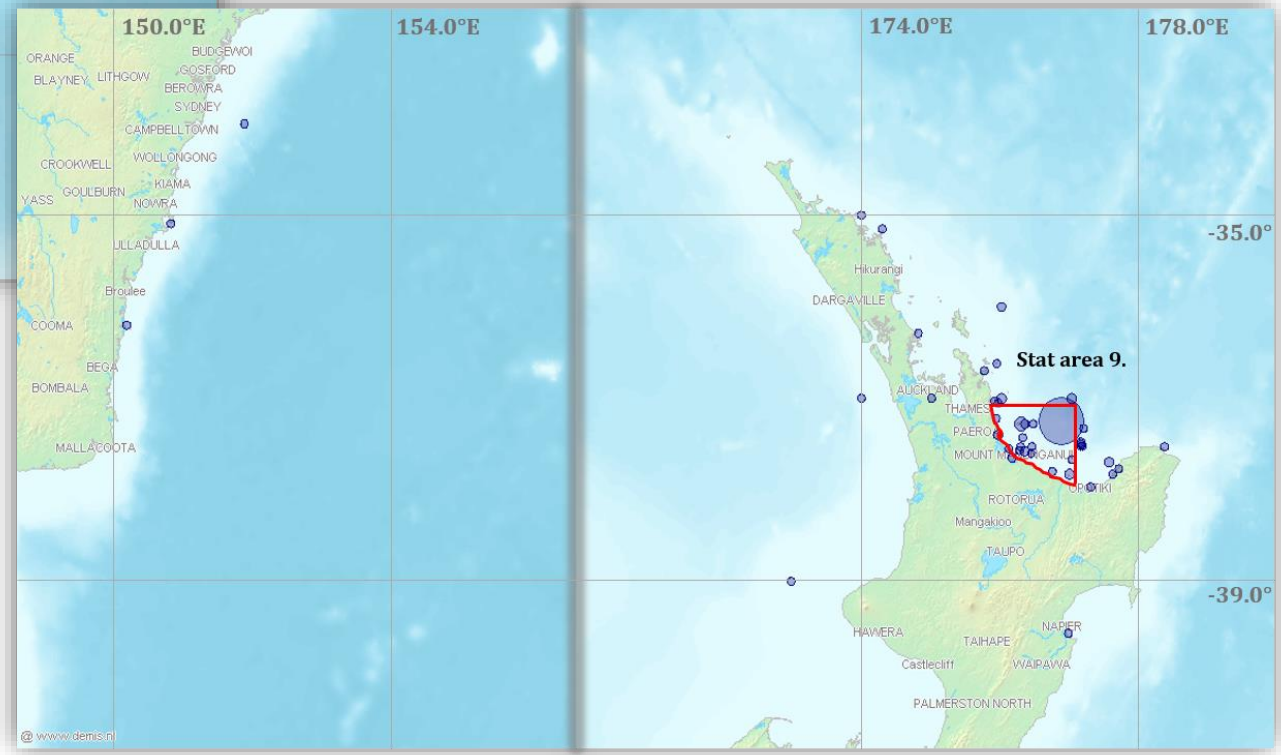


Stat area 10. (Eastern Bay of Plenty.)

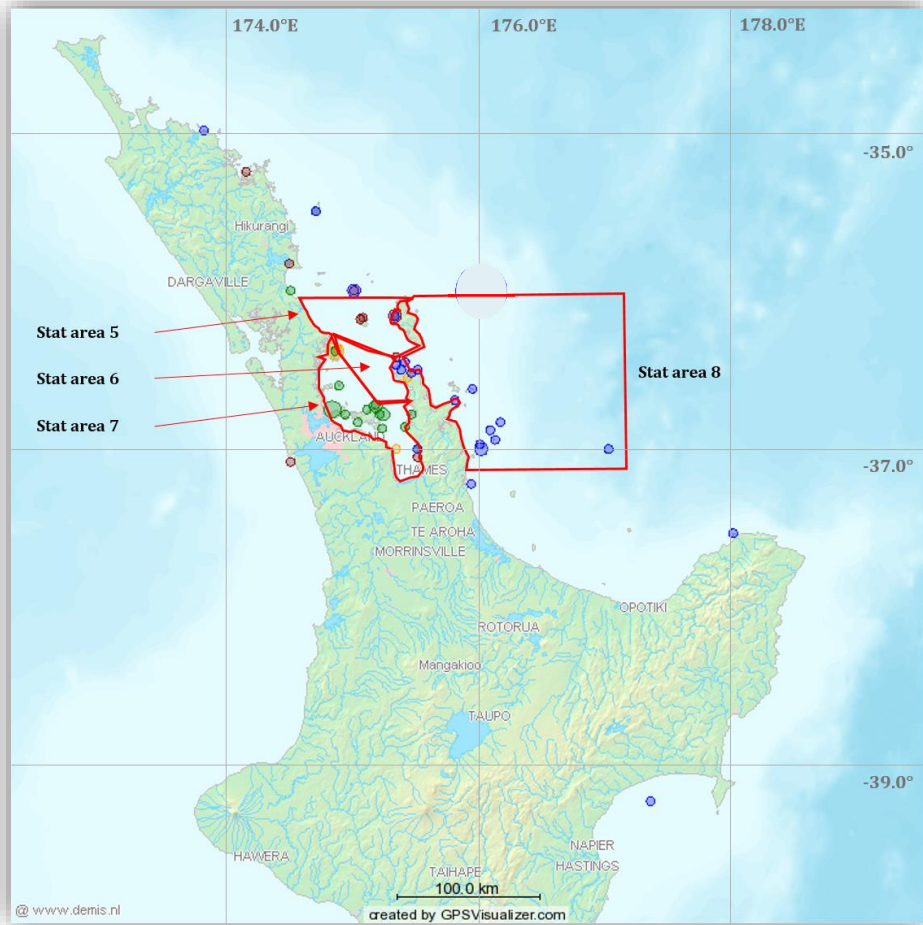
Just 106 individuals (7%) of fish tagged inside stat area 10 were recaptured elsewhere. The vast majority of those tagged and re-caught inside area 10 were around White Island. Small numbers have been re-caught in the Western Bay of Plenty, Bay of Islands and southern Hawke's Bay.

Stat area 9. (Western Bay of Plenty.)

233 individuals (89%) of fish tagged inside stat area 9 have been recaptured in area 9; the majority at Rangitira reef. Again, small numbers of fish appear to migrate along the coast between the Eastern Bay of Plenty up to the Bay of Islands. To date, kingfish tagged in stat area 9 are the only kingfish tagged in New Zealand coastal waters to be recaptured outside the New Zealand EEZ. Three individuals have been recaptured off the southern New South Wales coast in 1989/90, 1993/4 and 2009/10. Two of those caught off the Australian coast had been at liberty for over six years.



Gamefish tagging; single species reports.



- Kingfish recaptures**
- Tagged in stat area 5: ● (Red)
 - Tagged in stat area 6: ● (Yellow)
 - Tagged in stat area 7: ● (Green)
 - Tagged in stat area 8: ● (Blue)

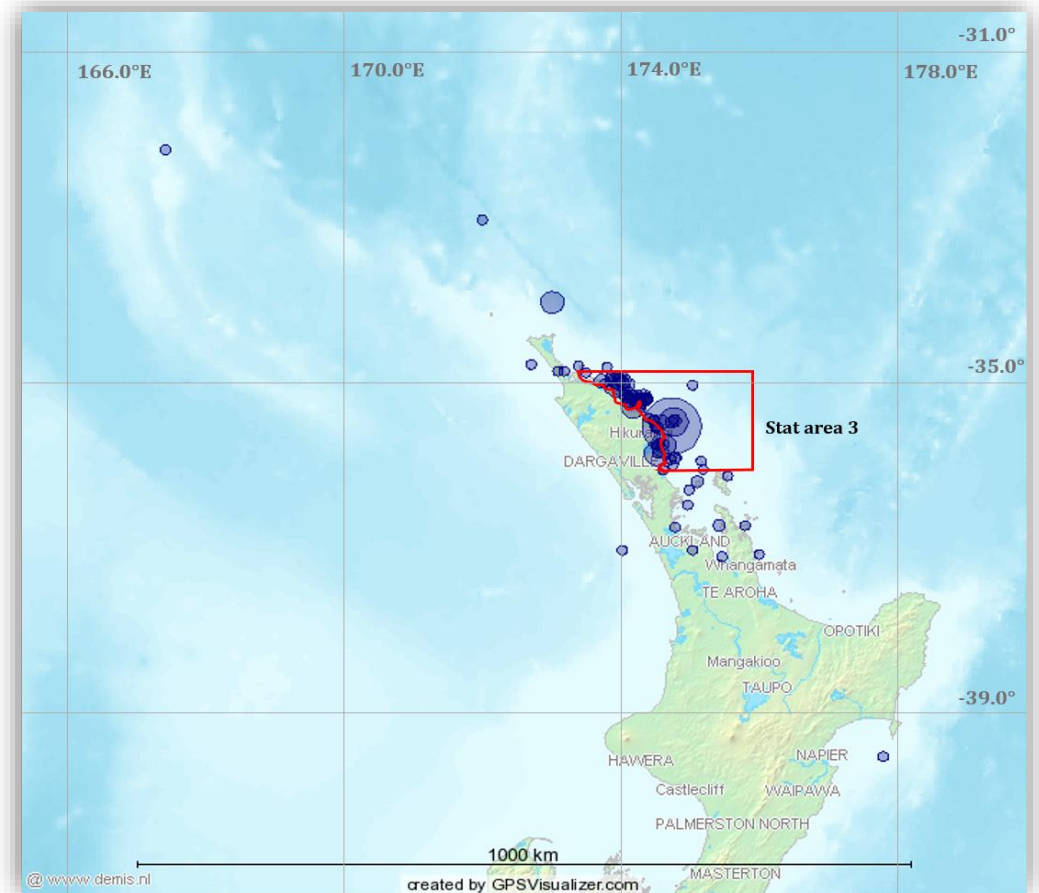
Stat areas 5-8. (Hauraki Gulf & East Coromandel.)

To date, ten individuals tagged in stat area 5 have been recaptured, 50% inside area 5 and 50% elsewhere. Most individuals have been captured in the Hauraki Gulf and East Northland coast although, a single individual was re-caught in 1989/90 off Manukau harbor in West Northland.

Even fewer individuals tagged in area 6 have been re-caught. Five were re-caught in area 6, around Kawau Island.

A larger number of fish tagged in stat area 7 have been recaptured, most likely because area 7 is the closest to Auckland. 90% of those tagged and recaptured from area 7 were re-caught at the same location.

62% of kingfish tagged and recaptured from area 8 were re-caught inside area 8, predominantly at Aldermen rise and the Aldermen Islands.

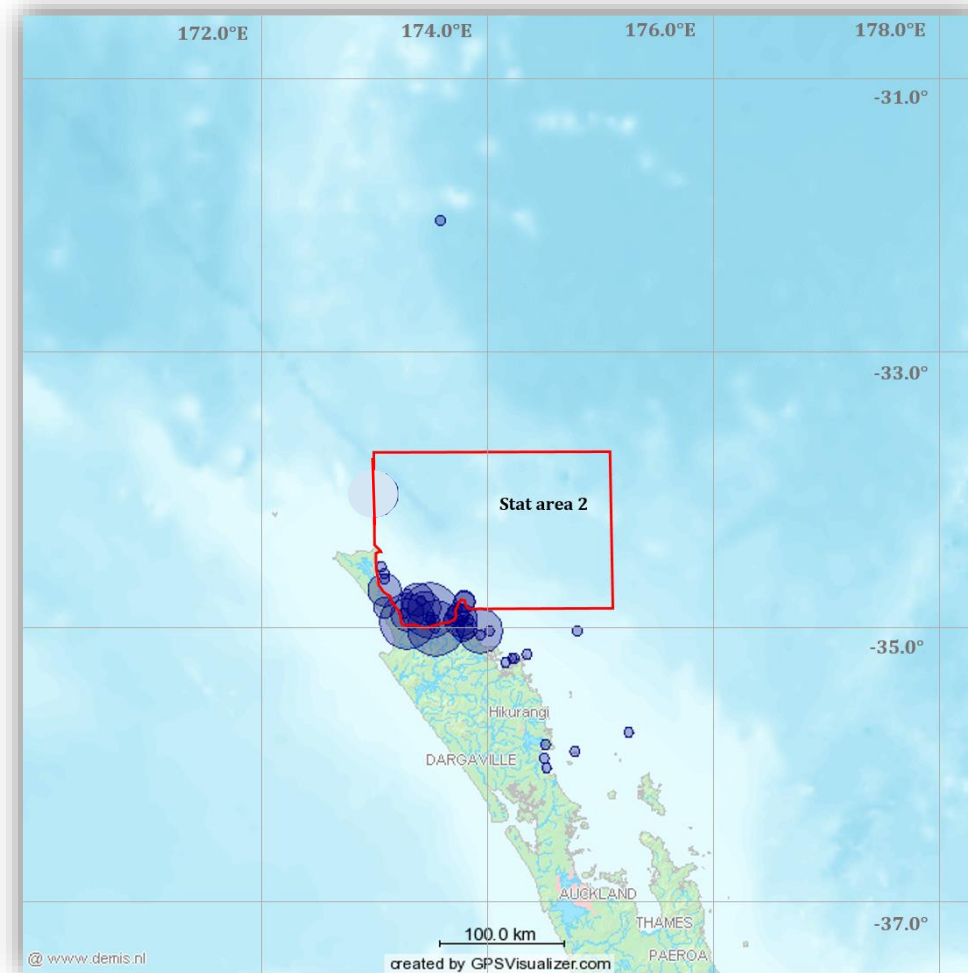
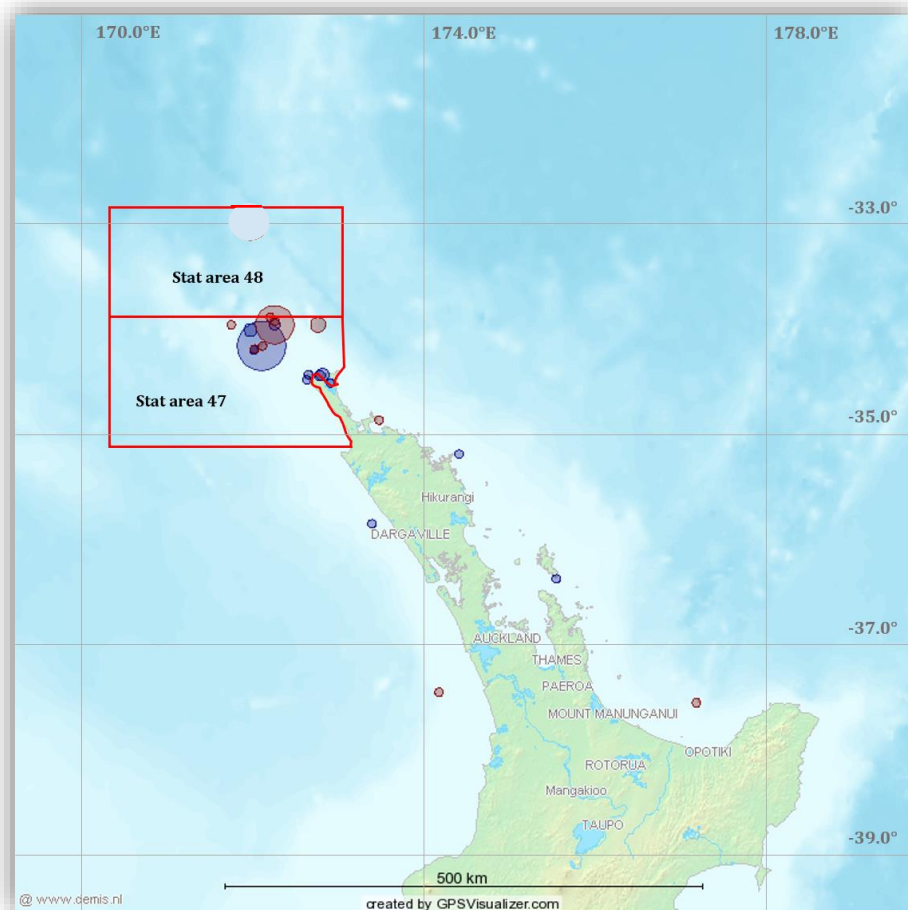


Stat area 3. (East Northland.)

85% of kingfish tagged and recaptured from area 3 were re-caught inside area 3 however, aside from a large group re-caught off the Poor Knights Islands, recapture locations inside stat area 3 have been relatively evenly spread along the coastline. This may reflect the intensity of recreational fishing effort in the area rather than an area particularly densely populated by kingfish. Again, there is evidence to suggest that, although broadly resident in nature, kingfish are capable of travelling large distances; individuals tagged in stat area 8 have been re-caught on Hawke's Bay and off Wanganello Bank.

Stat area 2. (North Cape (East.))

69% % of kingfish tagged and recaptured from area 2 were also re-caught inside area 2. Again, kingfish recapture locations are relatively evenly spread along the east Northland coast. Small numbers have also been recaptured further south and Ruahine reef off Tom Bowling Bay.



Kingfish recaptures

Tagged in stat area 47: ●

Tagged in stat area 48: ●

Stat areas 47 & 48. (North Cape (West,) Three King's Islands.)

92% of kingfish tagged and recaptured from area 47 were also re-caught inside area 47. Conversely, only 31% of kingfish tagged and recaptured from area 48 were also re-caught inside area 48. Three King's Island and Middlesex Bank both lie within the boundary of stat area 47 and kingfish tagged in areas 47 and 48 have been recaptured in relatively large numbers at both locations. Interestingly, although kingfish tagged in area 47 have been recaptured as far from Three King's Island as Great Barrier Island, (over 390km away,) as yet, no kingfish tagged in area 47 has been recaptured at King Bank; less than 150km from Three King's Island.

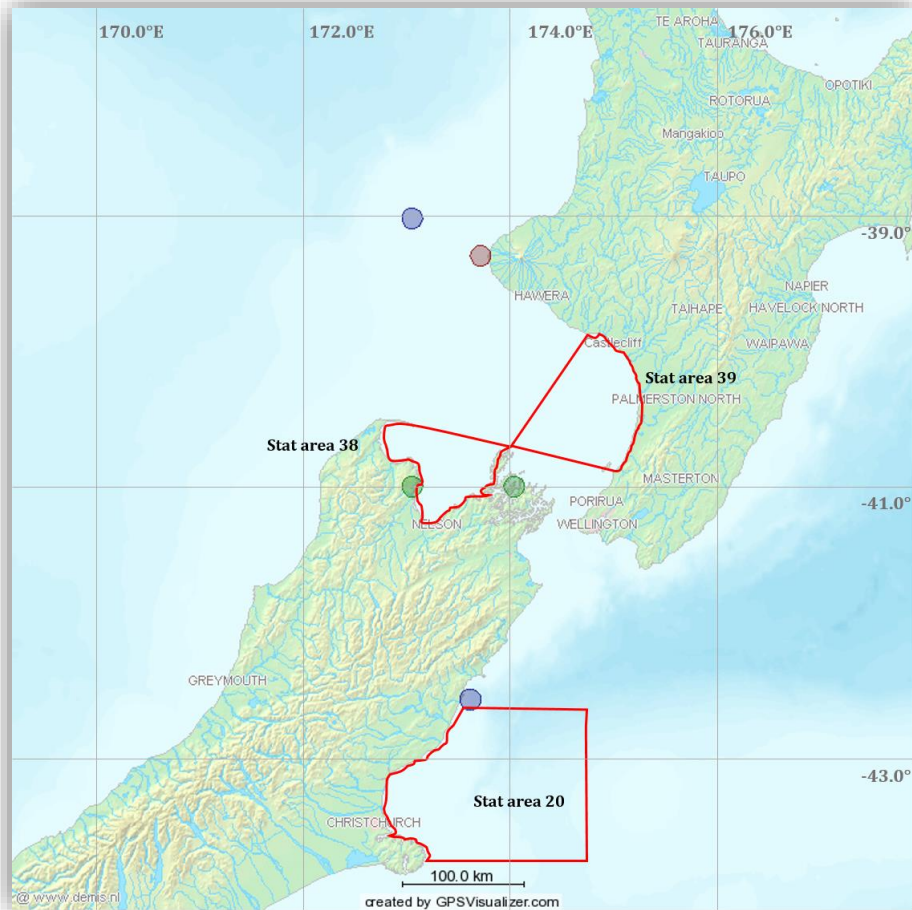
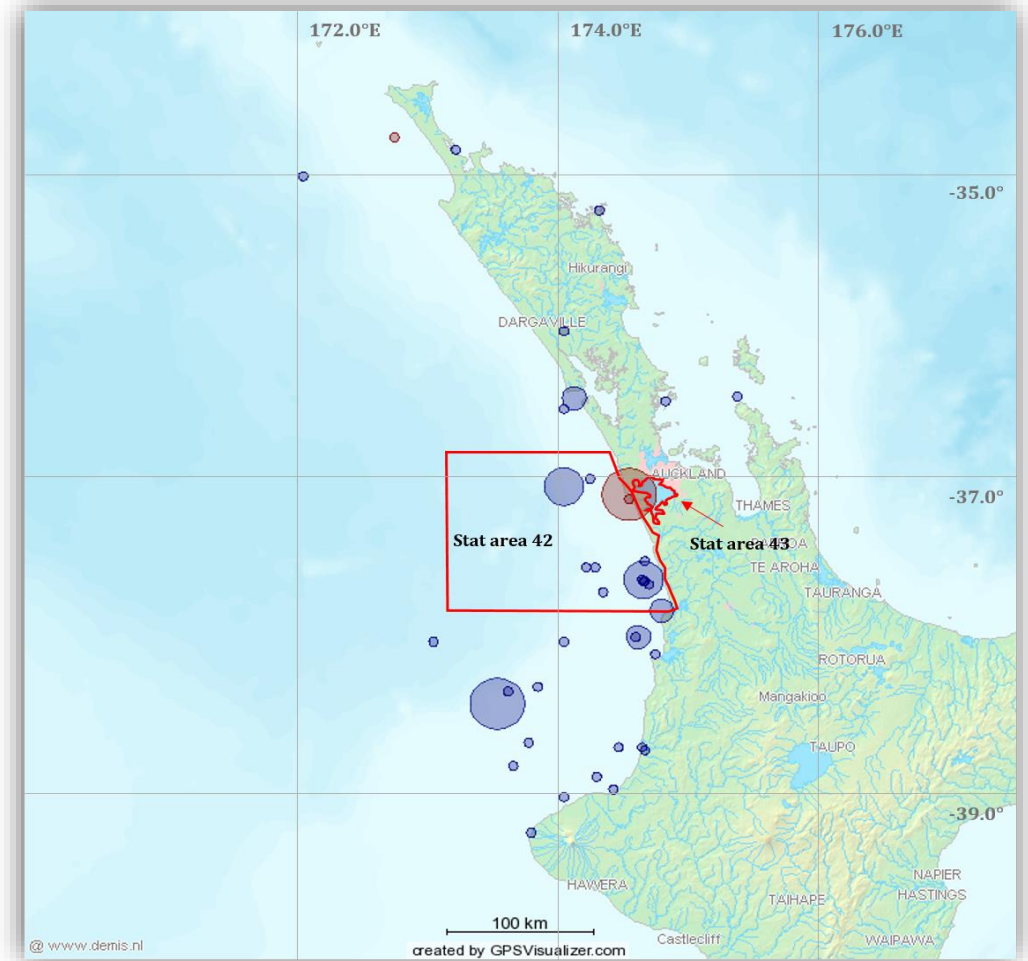
Gamefish tagging; single species reports.

Stat area 42 & 43 (Waikato, Manukau harbour.)

Kingfish tagged and recaptured in area 42 have been re-caught over much of the western coast of the North Island as well as East Northland and the Hauraki Gulf. Fishing intensity on the West coast is much lower than on the Northland coast/Bay of Plenty area. Consequently, only 48 individuals tagged in area 42 have been re-caught since 1975.

Stat area 43 comprises Manukau harbour. Only six individuals tagged inside area 43 have been recaptured to date. As the area is small and sub-optimal (estuarine) habitat for kingfish, further recaptures are likely to be few.

- Kingfish recaptures**
- Tagged in stat area 42: ●
 - Tagged in stat area 43: ●



- Kingfish recaptures**
- Tagged in stat area 20: ●
 - Tagged in stat area 38: ●
 - Tagged in stat area 39: ●

Stat areas 20, 38 & 39. (North Canterbury, Tasman Bay, Cook Strait.)

Very few kingfish have ever been tagged or recaptured further than 40°S during the last thirty years of the gamefish tagging program. Only five individuals from stat areas 20, 38 and 39 have been recaptured to date. This is partly due to relatively low recreational fishing pressure in these areas and partly due to the low abundance of kingfish, which tend to prefer warmer waters further north.