

lowest abundance at sites north of Waiheke Island and along the western coastline of the Coromandel Peninsula and Great Barrier Island (Figure 6B).

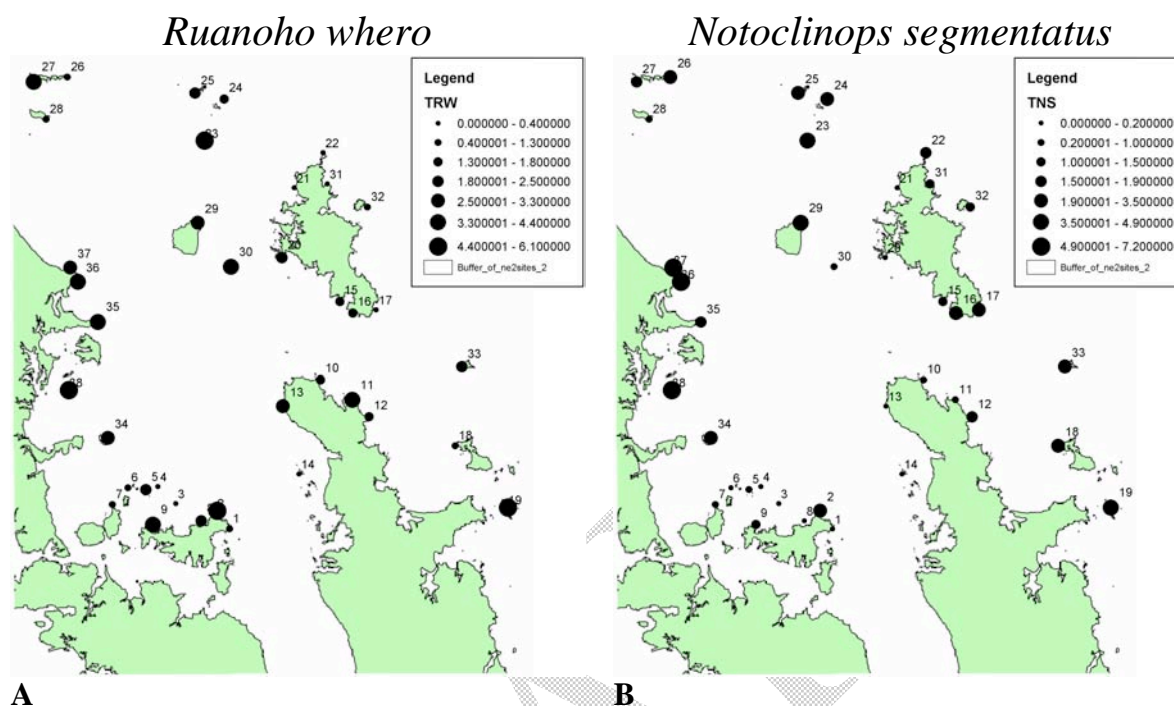


Figure 6. Spatial pattern of (A) abundance of the spectacled triplefin, *Ruanoho whero*, and (B) the blue-eyed triplefin, *Notoclinops segmentatus*.

The mottled triplefin, *Fosterygion malcolmi*, showed a general pattern of high abundance in the middle Gulf regions (e.g. Junction Island 20, the Watchman 36, and Goat Island 37), with considerable variation along the inner Gulf at sites in the vicinity of Waiheke Island (e.g. Kauri Point 1 and Thumb Point 2)(Figure 7A). *F. malcolmi* were generally abundant around the northern tip of the Coromandel Peninsula and Great Barrier Island. The variable triplefin, *Fosterygion varium*, showed a pattern of lower densities in areas of the outer Gulf, particularly around the northern tip of Coromandel Peninsula, Great Barrier Island and the Mokohinau Islands (Figure 7B). Sites of peak abundance occurred along the Leigh coastline, north of Auckland (i.e. sites 34–38). Site 31 (Donna's Bay, northeast Great Barrier Island) was the exception to this general pattern, having a considerably high abundance for this species (Figure 7B).

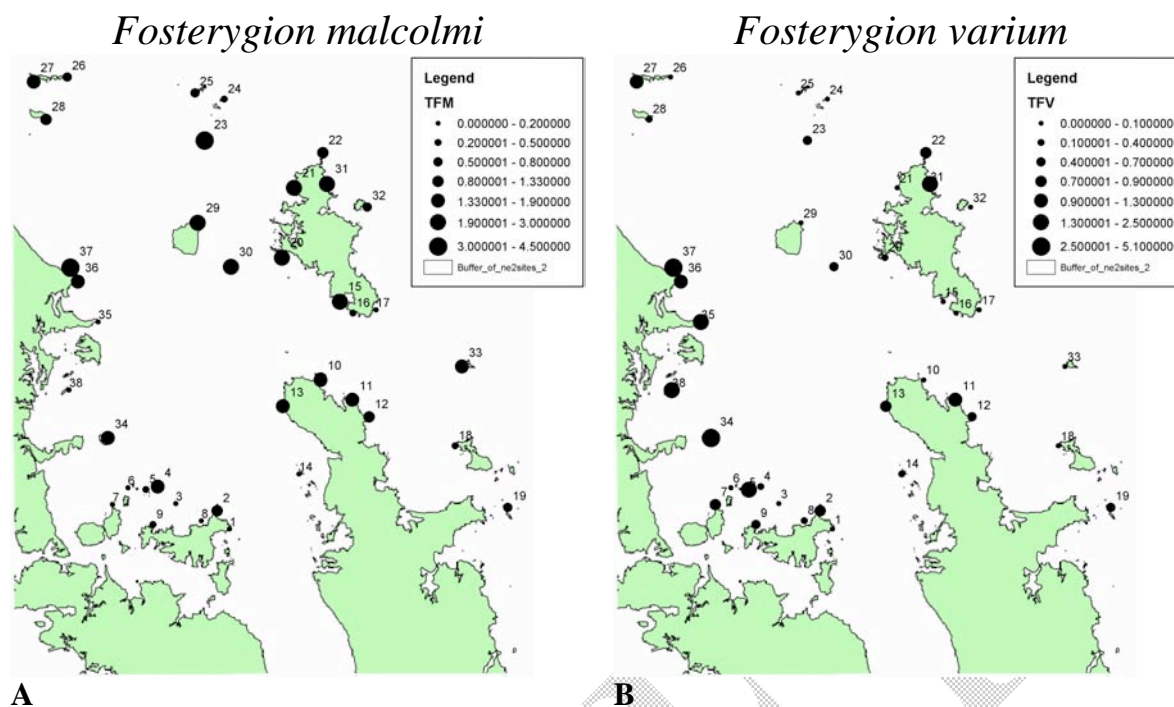


Figure 8. Spatial pattern of cryptic fishes (A) the mottled triplefin, *Fosterygion malcolmi* and (B) the variable triplefin, *Fosterygion varium*.

The yellow-black triplefin, *Fosterygion flavonigrum*, showed the opposite pattern of *F. varium*, with lower abundance in the inner Gulf and higher abundance towards the middle and outer Gulf (Figure 8A). The slender roughy, *Optivus elongatus*, showed its peak abundance at sites characterised by overhangs and crags, such as those along the outer edge of Coromandel Peninsula, on the south tip of Great Barrier Island, and northeast Great Barrier (Figure 8B).

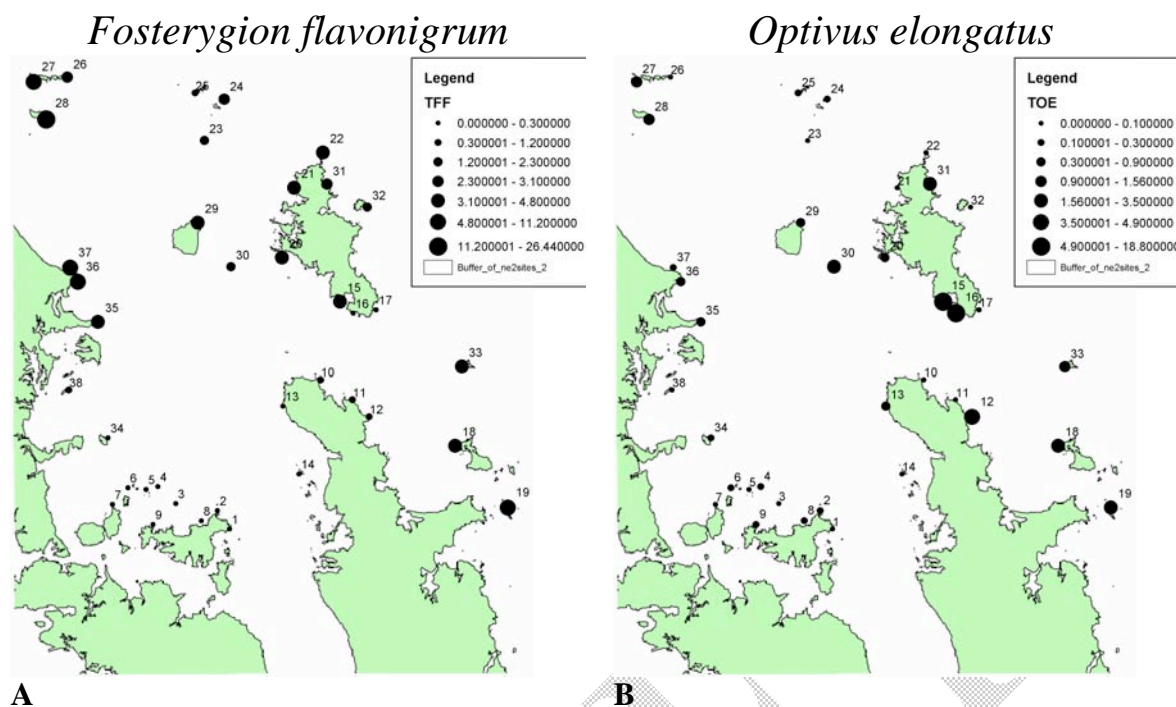


Figure 8. Spatial pattern of cryptic fishes (A) the yellow-black triplefin, *Fosterygion flavonigrum*, and (B) the slender roughy, *Optivus elongatus*.

The scorpion fish, *Scorpaena papillosus*, showed its highest abundance along the northern tip of Coromandel Peninsula and several sites in the north of Great Barrier Island and Mokohinaus (Figure 10A). Elsewhere, it was present in low numbers, with a tendency to be slightly more abundant at outer Gulf sites (Figure 10A). The crested blenny, *Parablennius laticlavus*, tended to be most abundant at outer Gulf sites, particularly at sites 12, 17, 23 and 37 (Figure 10B). Inner Gulf sites had consistently low abundance for this species (Figure 10B).

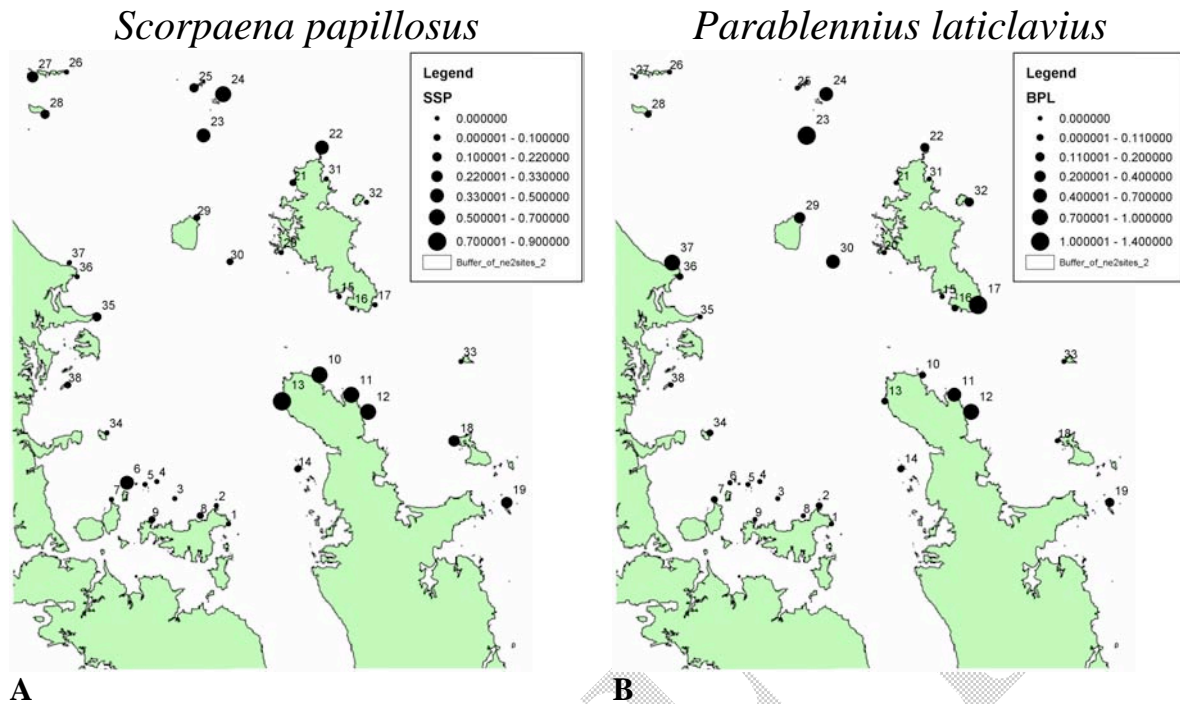


Figure 10. Spatial pattern of cryptic fishes (A), the scorpion fish, *Scorpaena papillosus*, and (B) the crested blenny, *Parablennius laticlavius*.

The common triplefin, *Fosterygion lapillum*, showed a pattern of high densities in the inner Gulf, particularly around Waiheke Island and other islands in the inner Gulf (e.g. sites 14 (Happy Jack Island) and 38 (Motuora Island))(Figure 11). A few sites with intermediate density occurred in the middle to outer regions of the Gulf (e.g. sites 20 (Junction Island) and 37 (Goat Island)).

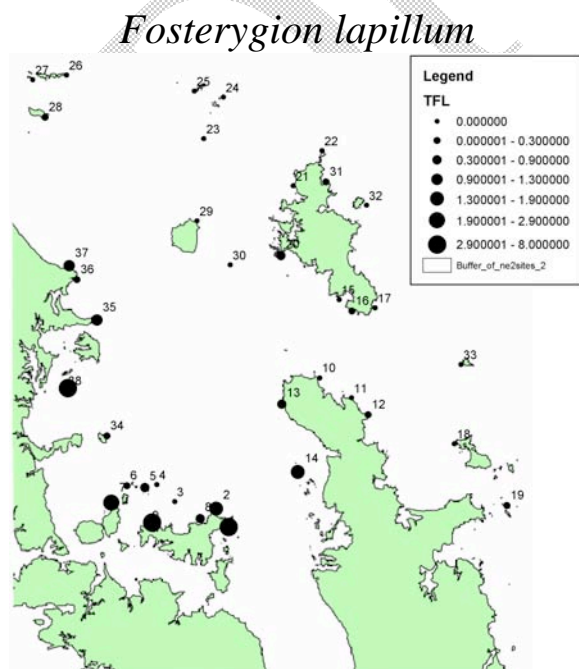


Figure 11. Spatial pattern of the common triplefin, *Fosterygion lapillum* in the Hauraki Gulf.

Distribution and Abundance of Mobile Invertebrate Consumers. Rocky reef surveys provided information on the distribution and abundance of 26 mobile invertebrate consumers. Of these, 8 species were common enough to model the influence of physical environmental factors on their distribution and abundance. The sea urchin, *Evechinus chloroticus*, was one of the most abundant mobile invertebrate consumers in the surveys, with its highest abundance in the outer Gulf, particularly eastern Great Barrier Island. Peak *Evechinus* densities were recorded at sites 17, 22, and 32 with 45.5, 13.6 and 32.3 individuals per 5m², respectively (Figure 12A). Sites in the inner Gulf had consistently low *Evechinus* abundance, though some sites in the outer Gulf also had relatively low abundance (e.g. sites 10 and 27)(Figure 12A). Cook's turbin, *Cookia sulcata*, showed a pattern of highest densities in areas of mid to outer Gulf, with peak abundance around the northern tip of Coromandel Peninsula and Great Barrier Island (Figure 12B). The Hen & Chickens and Mokohinau Islands and Flat Island (site 19) had low *Cookia* abundance.

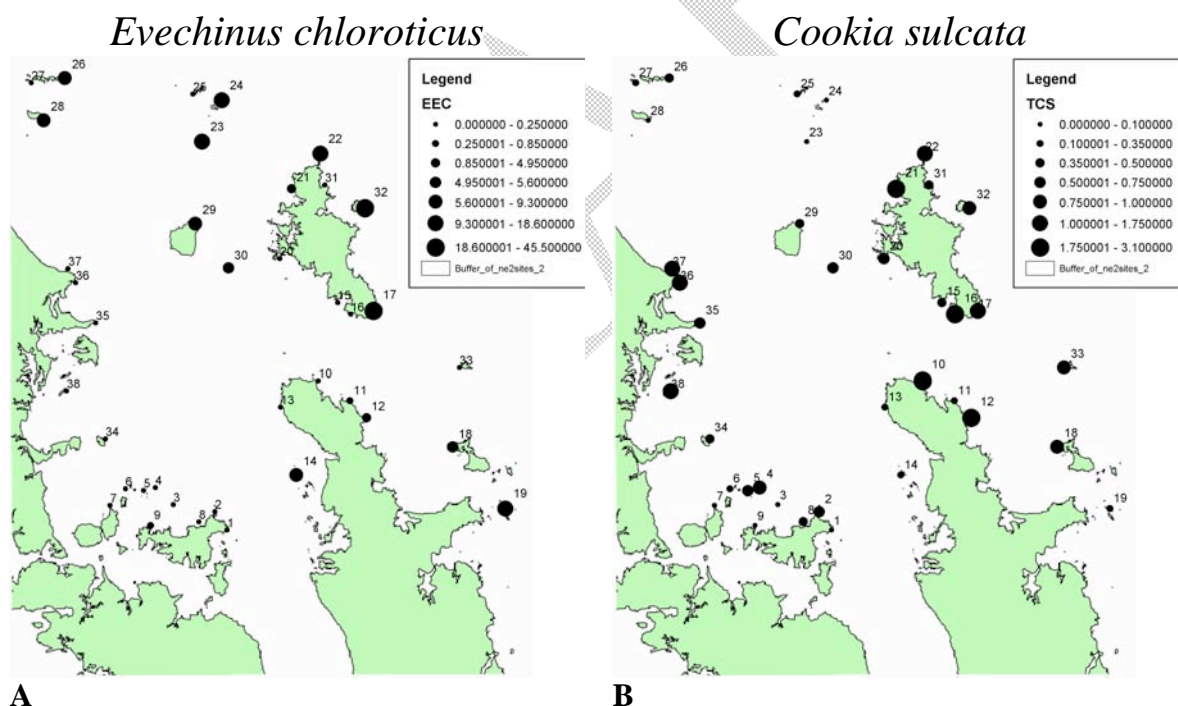


Figure 11. Spatial pattern of mobile invertebrate consumers (A) the sea urchin, *Evechinus chloroticus*, and (B) Cook's turbin, *Cookia sulcata*.

The ribbed rock shell, *Dicathais orbita*, had generally low abundance in the outer and northern part of the Gulf, with the exception of site 19 (Flat Island)(Figure 12A). *Dicathais* was relatively abundant along the north of Waiheke Island. Peak abundance occurred at site 34 (Shag Rock) with 7.65 individuals per 5 m². The sea cucumber, *Stichopus mollis*, had higher average abundance at inner Gulf sites (e.g. sites 9, 11, 36 and 38) with a mean

abundance of $0.75/\text{m}^2$. Sea cucumber densities were approximately 2 to 3-fold lower at outer Gulf sites, with an overall mean abundance in outer Gulf sites of $0.25/\text{m}^2$ (Figure 12B).

Large hermit crabs (not identified to species) showed a pattern of high abundance in inner to middle Gulf regions, with generally low numbers at outer and northern Gulf sites (Figure 13A). Two sites at the Mercury Islands in the outer Gulf (i.e. sites 18 and 19) had relatively high hermit crab densities of 0.6 and 0.8 individuals per 5 m^2 , respectively. The spotted topshell, *Calliostoma (Maurea) punctulatum*, showed no clear pattern of abundance throughout the Gulf, generally having low abundance in inner and outer Gulf regions with locations of high abundance scattered throughout (Figure 13B).

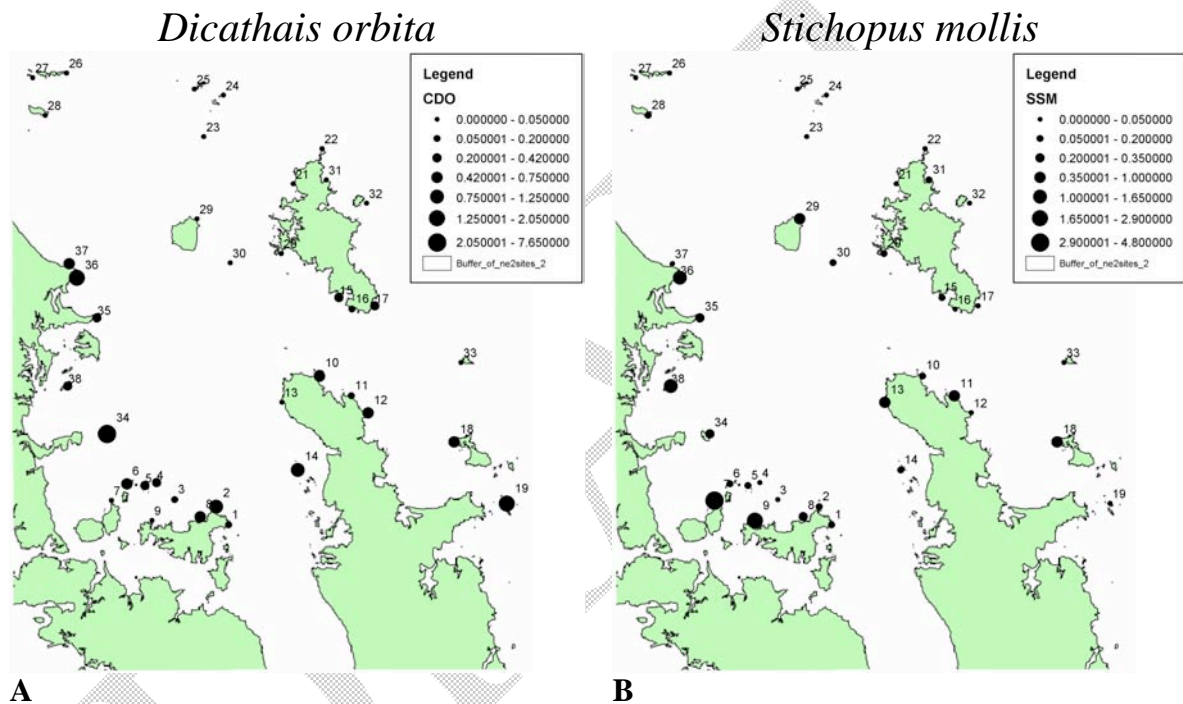


Figure 13. Spatial pattern of mobile invertebrate consumers (A) the ribbed rock shell, *Dicathais orbita*, and (B) the sea cucumber, *Stichopus mollis*.