

Section from NIWA report in 2004 titled

Characterisation of the amateur fishery for kahawai (*Arripus trutta*) in New Zealand

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Discussion

Hartill et al. (in press) suggested that this predominance of kahawai in autumn is consistent with an onshore migration of sexually mature fish following spawning in deeper waters, based on the information summarised in Annala et al. (2003) that “kahawai spawn on the seabed (60–100 m deep) in open water” and that “spawning female kahawai occurred in January and February 1993 in trawl bycatch in northern New Zealand”. This seems like a useful suggestion, which is given more support by the results presented here in which a similar predominance of autumn fish occurred in both 1994 and 1996.

However, clarification is required to extend our understanding of this point. Information on spawning presented by Annala et al. (2003) is an incomplete summary of work by Jones (1995). Given the general lack of information on spawning habitat in kahawai and the possible confusion that arises from over-summarising information, some discussion is appropriate. To this end, Jones’ (1995) original text is reproduced here in full.

Spawning female kahawai occurred in January and February 1993 in QMA 1 and QMA 9 trawl bycatch (MAF Fisheries unpublished data). Schools of running ripe female kahawai have been caught on the sea bed at about 60–100 m depth in Hawke Bay, but have never been observed in or reported from purse-seine landings in KAH 1, KAH 2 or KAH 3 (MAF Fisheries

unpublished data). However, there are reliable reports of running ripe female kahawai occurring at the surface (D.A. Robertson, pers. comm.).

A thorough reading of this paragraph shows that there is no certainty that kahawai spawn exclusively at 60–100 m because there has been information on the occurrence of surface spawning. In fact, it is possible that kahawai taken in bottom trawls may have actually been captured near the surface or in midwater when the trawl was either descending or ascending. A description by Webb (1971) on observations made from aircraft is informative in this context and is also reproduced here in full.

From observations made from the “W.J. Scott” it is evident that kahawai spawned in this area north of the South Island [Kahurangi Pt to Cloudy Bay]. Spawning was seen to occur in the whole shoal rather than as individual fish. Locating the breeding kahawai shoals was fairly simple owing to the behaviour of the fish: the fish curved half out of the water with the tail and the head only submerged, and with the actual spawning taking place by a series of pumping motions of the tail. Shoals of kahawai were observed to spend 2–3 minutes spawning on the surface before diving for 5–10 minutes, then re-appearing to continue spawning. This pattern continued for some time with one shoal being timed for 45 minutes. Breeding shoals observed varied in size from 10–35 tons.

Based on these observations there is uncertainty about the depth at which kahawai spawn — it may occur anywhere within the water column — though we do have some information on water depth where it occurs from the Hawke Bay catch. Nevertheless, this does not reduce the credibility of the suggestion by Hartill et al. (in press) relating the predominance of fish during autumn to spawners returning inshore. Although Webb’s (1971) description challenges the idea of spawning exclusively at depth, it appears to support the idea of kahawai forming spawning aggregations in areas that may not be readily accessible to many recreational fishers. If most kahawai in the boat-ramp surveys were taken relatively well inshore, the suggestion by Hartill et al. (in press) that the increases in numbers of kahawai during autumn is spawning fish returning from deeper water is probably well-founded and provides a useful piece of information on the behaviour of this species.

A second point discussed by Hartill et al. (in press) provides interesting background on the distribution of kahawai and is consistent with the work of Jones (1995). In this case Jones (1995) used kahawai records from research trawl data in which he showed a positive relationship between kahawai size and water depth, which appears to be common in fish species (MacPherson & Duarte 1991). Jones (1995) presents a progression for kahawai from juveniles (0+ age class) that recruit to sandy beaches in the surf zone, but can also be found in shallow water over eel grass (*Zostera* spp.) meadows (Robertson 1982, Jones & Hadfield, Drummond 1994) to developing fish that move into the deeper water of estuaries and harbours and eventually further offshore, as has been observed among fish tagged in Tasman Bay (Drummond 1994, and unpublished MAF Fisheries tagging data).