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**Taiji dolphin drive fishery and status of the exploited populations**

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## **Taiji dolphin drive fishery and status of the exploited populations**

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By analyzing catch statistics of the drive fishery operating from Taiji (33°36'N, 135°57'E), Wakayama Prefecture on the Pacific coast of central Japan, for 45 years (1970 to 2014), Kasuya (2019a, b) recognized that the catch of short-finned pilot whales declined during 2010 to 2014 (647 whales) to about 17% compared to the catch during the peak period of 1980–1984 (2,188 whales). The fishery for this most preferred species failed to reach the annual quota established in 1982 (except in 1996); however, catches of less preferred species, such as Risso's dolphins, were always closer to their quota. Kasuya inferred that the quota allocated for the short-finned pilot whale fishery did not limit the catch, and that the fishermen enjoyed, within their capacity, free unlimited take of this species. This interpretation suggests that the population of southern form short-finned pilot whales migrating off Taiji is depleted to a level that indicates the species requires more protection.

Here we attempt to further expand Kasuya's (2019a,b) analysis with additional statistics to better understand the status of the various species exploited in the Taiji drive fishery.

### **1. Distribution and abundance of some dolphin species off Japan**

Among the small cetaceans hunted by the Taiji drive fishery, short-finned pilot whales and striped dolphins are uncommon off the coasts of the East China Sea (western Kyushu) and the Sea of Japan, while false killer whales are more common in these waters than off the Pacific coast.

Two forms of short-finned pilot whales are known off the Pacific coast: the "northern form" or "shio" or "tappanaga" inhabiting waters north of the Kuroshio front (*ca.* 36°N) and the southern form or "naisa" or "magondo" in the Kuroshio Current system (Kasuya 2017). The former is genetically closer to individuals in the eastern North Pacific than to the southern form. The southern form is closer genetically to individuals in Hawaiian waters but are distinct (Van Cise *et al.* 2015).

Firm evidence does not exist on the population structure of the southern form of pilot whales off Japan. However, Kasuya (2017) recognized a density hiatus in the Kuroshio Current between two high density population areas, one west of the Kuroshio Current (coastal waters) and one east of it (offshore Kuroshio Counter Current area) and believed that, for management purposes, it is safe to assume these two areas are inhabited by different populations. Okinawa Island is situated to the east of the Kuroshio Current, about 1,100 km southwest of Taiji. If the two-population hypothesis is accepted, the southern form short-finned pilot whales being hunted by Okinawa (Nago) hunters belong to the population that inhabits the Kuroshio Counter Current area (see Fig. 33 in Miyashita 1993).

Although the same distribution is observed in striped dolphins (Kasuya 1999, Miyashita 1993 Fig. 29), bottlenose dolphins (Miyashita 1993, Fig. 31), and Risso's dolphins (Miyashita 1993, Fig. 32), spotted dolphins and false killer whales appear to be sparse in coastal waters off the Pacific coast of Japan (Miyashita 1993, Figs 30 and 34).

Using shipboard survey data, Miyashita (1993) estimated the abundance of several small cetaceans for June through September 1983–1991 in an area north of 30°N and west of 145°E, which corresponds to the habitat of the presumed coastal population of the southern form short-finned pilot whale (Table 2).

## **2. History of the fishery for southern form short-finned pilot whales off Japan**

Southern form short-finned pilot whales off the Pacific coasts of Japan have been hunted using a variety of methods: hand harpoon, purse sein (off Taiji, 1933-1935), small caliber whaling cannons (since 1903, named small-type whaling in 1947), and opportunistic driving operations (Kasuya 2017). Here, we concentrate on the drive fishery that uses motor-driven fishing vessels from Taiji and villages on the coast of Izu Peninsula (34°38'N-35°03'N, 138°45'E-139°26'E), which is located about 300km northeast of Taiji. Consumers' preferences for dolphin species differed for these two locations. People who received meat from the Izu fishery (Shizuoka, Kanagawa, and Yamanashi Prefectures) preferred striped dolphins over southern form short-finned pilot whales, while people in the Taiji area (Wakayama Prefecture) preferred southern form short-finned pilot whales.

## *2.1 Drive fishery off the Izu coast*

This fishery has been reviewed by Kishiro and Kasuya (1993) and Kasuya (2017). Numerous villages on the Izu Peninsula operated an opportunistic, community-based dolphin fishery in nearshore waters. Around 1920 some of them (e.g., Kawana group) introduced motor driven vessels to the operation and expanded their operation to the offshore area. The fishery was placed under prefectural license in 1951. Their main targets were limited to striped dolphins and short-finned pilot whales due to the food preferences of local consumers. When the Japanese government introduced catch quotas by species in 1993, Izu fishermen did not receive a quota for short-finned pilot whales, possibly because of the almost non-existent catch of the species at that time. However, we examined several unrecorded drives of short-finned pilot whales (33 individuals in 1965, 30 in 1967, 73 in 1977, and 80 in 1978) (Kasuya 2017 Table 3.16). Some of these whales were sold live to Japanese aquariums. With their last drive of a bottlenose dolphin school in 2004, they have apparently ended their dolphin drives that had been conducted for nearly 400 years (Kasuya 2017). Since the mid-1970s, consumers of the former Izu fishery have been receiving Dall's porpoise meat from northern Japan that has been taken by a hand harpoon fishery (Kasuya 2017).

## *2.2 Drive fishery off Taiji*

The last community-based opportunistic dolphin drives occurred in the 1950s. During the 1960s, all small cetaceans were taken by a single, small-type whaling vessel and by some hand harpoon fishermen. The first attempt of driving dolphins from offshore was made in 1969 by a small-type whaler and a group of hand harpoon fishermen who wanted to capture live pilot whales for the aquarium of Taiji Town. This was followed by the establishment of a drive team. In 1971, a drive team was established that consisted of 8 hand-harpoon dolphin fishermen and a second team of 7 fishermen was added beginning in 1979. Success of the dolphin drive suppressed the hand harpoon operation and forced the single, small-type whaler to move to other waters (e.g., off Chiba Prefecture for Baird's beaked whales).

In 1982, the two drive teams merged into a single operation with the same number of operating vessels and were placed under the prefecture license system with a voluntary catch limit of 500 short-finned pilot whales and 5,000 other

dolphins (species not specified). Later, this voluntary catch limit became a requirement for obtaining the prefecture license.

In 1991, the catch limits were modified to 2,900 dolphins, which included a maximum of 500 short-finned pilot whales. Additionally, take of 5 live killer whales was allowed for research purposes to be held in aquariums. On 7 February 1997, a pod of ten killer whales was driven into Hatakejiri Bay, Taiji. Five of these whales were sold to three Japanese aquariums and the other five were released. There have not been any additional live captures of killer whales since the “Taiji Five” were collected.

In 1992, the quota was reduced to 2,500 dolphins, including a maximum of 1,000 striped dolphins and 300 short-finned pilot whales. In 1993, the Fisheries Agency set quotas by species for all the Japanese dolphin fisheries. The Taiji drive team received a quota of 940 bottlenose dolphins, 450 striped dolphins, 420 spotted dolphins, 350 Risso’s dolphins, 300 short-finned pilot whales, and 40 false killer whales. This quota was maintained till 2006, then it was decreased annually along with the addition of new target species: Pacific white-sided dolphins in 2007 and rough-toothed dolphins and melon-headed whales in 2017. By the 2020/2021 season, the Taiji quota of short-finned pilot whales was reduced to 101 (Table 1).

Historical quotas and catches till 2014 are available in Kasuya (2017). The quotas and catches for later periods along with the earlier ones, are listed on the Fisheries Agency Web page (<https://www.kokushi.fra.jp>). The most recent quotas for the 2020/2021 season for small cetaceans are given in Table 1.

### **3. Market value of dolphins**

The mean dockside price of dolphins, excluding short-finned pilot whales and killer whales, landed at Taiji Fish Market increased about 8.2 times from 11,000 yen/individual in 1981 to 91,000 yen/individual in both 1990 and 1991, while the inflation index of Japan increased only 1.2 times (from 222 to 260) during this period. This price increase seems to have reflected a decline in the whale meat supplied from the whaling industry (Kishiro and Kasuya (1993). In 1997, five killer whales were sold for \$250,000 USD per individual.

The same data allow us to compare differences in the prices among species, which reflects the preference of consumers as well as the differences in body size among species. In 1991, short-finned pilot whales were sold at an average of 826,000 yen/individual (all sizes combined), but the price of other species was much lower compared to this: 28% for Risso's dolphin, 13% for bottlenose dolphin, 5% for striped dolphin, and 3% for spotted dolphin. From these prices, we conclude that the motivation of Taiji fishermen for hunting dolphins could have increased with time, particularly for short-finned pilot whales.

#### **4. Performance of the Taiji driving team**

##### *4.1 Southern form short-finned pilot whale*

Catch limits for the species started in 1982 at 500 individuals/year as a voluntary quota set by the drive fishermen. It moved to an obligatory government quota, and the number gradually diminished (see above). The catch peaked in 1980–1984 and then declined gradually. During the 38 years of operation, despite decreasing catch limits, the catch reached the quota only once in 1996, and the 5-year rate fluctuated around 30-60% of the quota (Table 3). This means that the quota did not function to limit catch, and that drive fishermen enjoyed the maximum catch available with their equipment. The catch decline from 2,188 of the peak year (1980-1984) down to 241 more recently (2015-2019) must indicate a decline in availability of the species in the fishing ground. The catch level in 2015-2019 is about 11% of the level caught in 1980-1984.

The abundance of short-finned pilot whales targeted by the Taiji fishery was estimated at around 10,000-20,000 individuals in 1983–1991 (Table 2). Since the time of that abundance estimate, the Taiji drive fishery took a total of 7,225 individuals (1980-2019) and small-type whalers took an additional 784 individuals. The total removal is 8,009 individuals. These figures do not seem to disagree with the decline of availability of the species to the fishery based on the calculations. Therefore, the quota should be greatly reduced to stop what appears to be a substantial population decline.

Currently we don't know how the short-finned pilot whale population responded to the operation of the drive fishery. Such attempts need to keep in mind that the unit of harvest is not individual dolphins but matrilineal groups. Genetic

analysis of their school structure by Kage (1999, cited in Kasuya 2017), suggests that both sexes of the species live in matrilineal groups probably for life and mate with the opposite sex of other groups, which is true for the resident killer whales in the eastern North Pacific (Olesiuk *et al.* 1990). We expect that there will be a considerable time lag between the loss of groups by driving and recovery of the number of groups, where surviving groups will gradually increase in size followed by splitting of the group.

To make the situation more difficult, small-type whalers using harpoons selectively hunt individuals, especially large individuals, out of each school encountered. This is especially detrimental because loss of older females in a matrilineal killer whale group adversely affects the survival of younger members of the group (Foster *et al.* 2012). Both female killer whales and short-finned pilot whales are known to have extended post-reproductive lifespans (Marsh and Kasuya 1984).

#### 4.2 *Common bottlenose-dolphin*

The abundance of bottlenose dolphins targeted by the Taiji fishery was estimated at around 23,000–59,000 individuals in 1983–1991 (Table 2). During the 1980s, without any quota, the total catch at Taiji was 5,334 individuals. Since a quota was established (1993–2019) an additional 8,262 dolphins were killed by the fishery, but during this period the quota was never reached (Table 3). The highest five-year catch was during 2000–2004 when 2,997 dolphins (67% of the quota) were taken.

Quotas and catches of the species show similar features as seen in short-finned pilot whales, i.e., declines in both the quota and in the achievement rate. However, there is one element of uncertainty to be considered: the change in the demand.

Bottlenose dolphin meat was not a preferred item of consumers, but the demand has been changing for different reasons. The sudden increase of the catch in the early 1980s was initiated by demand from Japanese zoos to use this species as animal food (Kasuya 2017, 2019a). After the zoo demand diminished, trade in live dolphins increased, first in Japan and then for export, especially as dozens of new aquariums were built in China (Zhang *et al.* 2012). In addition, there was an

increase in demand for Japanese *Tursiops* as other sources of live bottlenose dolphins outside of Japan decreased.

According to Kasuya (2019a), the preferred size of live females is 210-270 cm in total length, and males of about the same size are sold for around 70% of the female price. This implies that a live animal is sold at 20-55 times the price of a carcass during this time period. The number of live animals sold for aquarium use increased from 159 in 1997–1999 to 263 in 2000–2004, 348 in 2005–2009, and 486 in 2010–2014. The proportion of these live dolphins in the “total number of animals taken” increased steadily from an average of 10.4% in 1997–2004 (annual fluctuation: 5.1-18.5%) 22.9% in 2005–2009 (annual fluctuation: 12.6-28.1%), and to 47.7% in 2010–2014 (annual fluctuation: 32.9-70.4%).

In view of the fact that the proportion of animals with the preferred body sizes in schools driven at Iki and Izu was only 22-23% for each sex (Kasuya *et al.* 1997), the above observed high catch rate of live animals is impossible unless individuals of undesirable size had been released alive (Kasuya 2019a). Such operation is possible depending on the definition of “take”.

After the preferred dolphins are culled from a school driven into the cove, the remaining dolphins are released. These individuals, as well as those that died, are not counted against the quota. The only ones counted are those killed or taken live for aquariums. This underestimates the damage the fishery causes to the dolphin population. The IWC Scientific Committee (2015) noted that there are a number of issues related to the hunt that are likely to produce what has been called “cryptic mortality”. These include at least the following: (1) stress caused by holding the dolphins for as long as five days prior to their release back to the wild, (2) serious injury while being held captive, (3) abortions caused by stress during the drive or holding and death of a calf due to mother/calf separation (Kita *et al.*, 2013) and (4) post-release deaths due to weakened physical condition (e.g., due to pneumonia) caused by stress. No estimates of cryptic mortality have been made nor is it counted against the quota (IWC 2015). Given the possibility that the bottlenose dolphin population is being depleted off Taiji, further details of the hunt are needed for firm conclusions.



#### 4.3 *Pantropical spotted dolphin*

Following the decline of striped dolphins available to the Izu fishery, the pantropical spotted dolphin supported the fishery for a short period from the late 1970s to 1980s to shortly before the final cessation of the Izu operation in 2005. Documented takes over this time were 9,293 individuals during 1970–1979 and 8,087 during 1980–1989 (Kasuya 2017 Table 3.16). This was followed by a relatively high catch of 2,943 at Taiji during 1985–1989.

The only data available on the population structure of this species off the Pacific coast of Japan indicate that the density of the species is low in coastal waters. The abundance of pantropical spotted dolphins targeted by the Taiji fishery was estimated at around 8,000–33,000 individuals in 1983–1991 (Table 2). Since the time of that abundance estimate, the Taiji drive fishery took 4,060 individuals (1990–2019). During the time period from 1995 to 2014 only 24 to 36% of quota was landed. Between 2015 and 2019 only 114 individuals were taken, which was only 6% of the quota. It is probable that the small coastal population has been depleted by drive fisheries off Taiji and Izu.

#### 4.4 *Striped dolphin*

This species in the Pacific coastal waters off Japan supported the drive fishery off the Izu coast, and the collapse of the Izu fishery is believed to have been due to the depletion of this population. Although there was incomplete coverage of drive teams operated before 1972, we can recognize catch decline of the species based on data in Kasuya (2017, Tables 3.14 and 3.16): 82,768 individuals in 1960–1969; 60,027 in 1970–1979; 9,553 in 1980–1989; and 32 in 1990–1999. If the fishery had targeted the large offshore population of the species, which was estimated at around 500,000 individuals (Miyashita 1993), the Izu fishery could have continued (Kasuya 1999). Miyashita (1993), using data from vessel surveys, estimated that the coastal population of striped dolphins in 1983–1991 was around 6,000–67,000 individuals (see Table 2).

The population structure of the striped dolphins that inhabited waters off the Pacific coast of Japan and supported the drive fishery of Izu and Taiji still remains to be clarified. There is also a possibility that the drive operations targeted more than one population and their main target population was different (Kasuya

2017). Since 1995, the catches of these dolphins have been 91 to 99% of the quota. Therefore, the current catch data do not provide any new understanding about the population status of striped dolphins.

#### 4.5 *Risso's dolphin*

Meat of this species was not preferred by local consumers in the early years, but the market value increased following a decline in the supply of minke whale meat in the late 1980s. Miyashita (1993), using data from vessel surveys, estimated that the 1983–1991 population of Risso's dolphins off Japan was around 20,000–46,000 individuals (Table 2). Between 1970 and 1989, 246 Risso's dolphins were taken by the Taiji drive fishery compared to 3,603 landed between 1990 and 2009. The Taiji fishery almost always met the annual quota for this species in 2000–2014. However, from 2015–2019 catches decreased and only 979 (78%) of the quota (1,260) were taken. Therefore, the current catches do not provide much data about the population trend for the species off Taiji, but we are concerned that the recent decline in the catch level could signal the start of a population decline.

### 5. Conclusion

In summary, we believe that the available data suggest the following for the status of the species hunted in the Taiji dive fishery:

1. Since the population of short-finned pilot whales off Taiji was estimated in 1983–1991 to be about 14,000 whales, over 8,000 have been taken in the drive fishery. During the period with a quota (since 1982), the catches ranged between 33% to 59% of the quota, and recent catches in 2015–2019 declined to 11% of the catch from the peak years (1980–1985). We are concerned because this means the hunt had no restriction in the number of whales killed. Therefore, the quotas must be drastically reduced to stop further decline of the population.
2. The status of bottlenose dolphin population taken off Taiji is of some concern for three reasons. First, the population in 1983–1991 was estimated at about 36,000. Second, catches have steadily declined to 34–67% of the quotas during 1995–2019. Third, the preferred size and sex of dolphins removed live for aquariums are weaned, immature-females; other remaining individuals are likely released and not counted against the

quota. For these reasons, available data are insufficient to judge the status of that population. In the meantime, a better management program is needed to ensure that the population does not decline.

3. Catches of pantropical spotted dolphins in the drive fishery off the Izu Peninsula declined after 1983. Catches of this species off Taiji also followed the decline. During the period 2015–2019 only 6% of the quota was taken. Therefore, we believe the combined Izu/Taiji catches have depleted the coastal population and that quotas must be greatly reduced.
4. Striped dolphins were depleted in the past by the drive fishery operated off the Izu Peninsula. The catches off Taiji since 1995 have been 91–99% of the quota and do not provide any new understanding about the status of this population.
5. Risso's dolphin catches from 2000 to 2014 were near the level of the quotas, but more recently (2015-2019), catches have dropped to 78% of the quota, which may be reason for concern. Therefore, a precautionary approach would be to reduce the quota.

Unfortunately, the decline in the numbers of small cetaceans hunted off Taiji is following the same pattern as has been seen in commercial whaling with the most valuable species depleted first, followed by less desirable species. Therefore, a more precautionary approach is needed to manage the Taiji drive fishery.

## References

- Foster, E.A., Franks, D.W., Mazzi, S.K. *et al.* 2012. Adaptive prolonged postreproductive life span in killer whales. *Science* 337: 313.
- IWC 2015. Report of the Sub-Committee on Small Cetaceans. *Journal Cetacean Research Management* 16 (Suppl.) 16:291-309.
- Kage, T. 1999. *Study of school structure of short-finned pilot whale (Globicephala macrorhynchus) using DNA polymorphism*. PhD thesis, Mie Univ. Tsu, Japan. 141pp. (In Japanese)
- Kasuya, T. 1999. Review of the biology and exploitation of striped dolphins in Japan. *J. Cetacean Res. Manage.* 1(1): 81-100.
- Kasuya, T. 2017. *Small Cetaceans of Japan: Exploitation and Biology*. CRC Press, Boca Raton. 475pp.
- Kasuya, T. 2019a. *Biology and conservation of small cetaceans around Japan*. Univ. Tokyo Press, Tokyo. 337pp. (In Japanese)
- Kasuya, T. 2019b. In order to avoid repetition of tragedies of dolphin fisheries. *University Press*, No. 560: 26-32. Publication of University of Tokyo Press. (In Japanese)
- Kasuya, T., Izumisawa, Y., Komyo, Y. *et al.* 1997. Life history parameters of common bottlenose dolphins off Japan. *IBI Rep.* (Kamogawa, Japan) 7:71-1-7. (In Japanese)
- Kishiro, T. and Kasuya, T. 1993. Review of Japanese dolphin drive fisheries and their status. *Rep.int. Whal. Commn* 43:439-452.
- Marsh H. and Kasuya T. 1984. Changes in the ovaries of the short-finned pilot whale, *Globicephala macrorhynchus*, with age and reproductive activity. *Rep Int Whal. Comm. Special Issue* 6:311-35.
- Miyashita, T. 1993. Abundance of dolphin stocks in the western North Pacific taken by Japanese drive fishery. *Rep. int. Whal. Commn* 43: 417-437.
- Olesiuk, P.F., Bigg, M.A. and Ellis, G.M. 1990. Life history and population dynamics of resident killer whales (*Orcinus orca*) in the coastal waters of British Columbia and Washington State. *Rep. int. Whal. Commn* (Special Issue 12): 209-243.
- Van Cise, A.M., Morin, P.A. Baird R.W. *et al.* 2016. Redrawing the map: mtDNA provides new insight into the distribution and diversity of short-finned pilot whales in the Pacific Ocean. *Marine Mammal Science* 32(4): 1117-1199. Doi:10.1111/mms12315.
- Kita, Y.F., Hosomichi, K., Suzuki, S. *et al.* 2013. Genetic and family structure in a group of 165 common bottlenose dolphins caught off the Japanese coast. *Marine Mammal Science* 29(3):474-496.
- Zang, P., Sun, N., Yao, Z. and Zhang, X. 2012. Historical and current records of aquarium cetaceans in China. *Zoo biology*. 31. 336-49. 10.1002/zoo.20400.

Table 1. Catch quotas of toothed cetaceans for Japanese fisheries in 2020 season (small-type whaling) or 2020/2021 season (drive and hand harpoon fisheries).

Type of fisheries	Hand harpoon					Drive		S. t. whaling	Total
	Hokkaido	Iwate	Miyagi	Okinawa <sup>1)</sup>	Wakayama	Wakayama	Shizuoka		
Dall's porpoise (D) <sup>2)</sup>	695	3313	129						4137
Dall's porpoise (T) <sup>3)</sup>	50	4336	12						4398
Pacific white s. dolphin		108			26	100	26		260
Striped dolphin					71	450			521
Spotted dolphin					49	280			329
Rough tooth. dolphin				10		20			30
C. bottlenose dolphin				5	47	298	24		374
Fraser's dolphin				42	21	300			363
Risso's dolphin					147	251			398
False killer whale				14		70	7	20	111
Short fin. p. whale (S) <sup>4)</sup>				26		101		33	160
Short fin. p. whale (N) <sup>4)</sup>								36	36
Baird's beaked Whale								72 <sup>5)</sup>	72
Total	745	7757	141	97	361	1870	57	161	11189

<sup>1)</sup> Using cross bows. <sup>2)</sup> Dalli-types in the Sea of Japan and Southern Okhotsk Sea. <sup>3)</sup> Truei-types in the central Okhotsk Sea and Pacific coast of Japan. <sup>4)</sup> S: southern form, N: northern form. <sup>5)</sup> 4 for Okhotsk Sea, 10 for Sea of Japan, 58 for Pacific.

Table 2. Abundance of dolphins off the Pacific coast of Japan, west of 145°W and north of 30°N, estimated using sighting data covering 9 years from 1983 to 1991 (Miyashita 1993).

Species	Risso's dolphin	Short. fin. p. whale	C. bottlenose dolphin	Spotted dolphin	Striped dolphin
Mean	31,012	14,012	36,791	15,900	19,631
95% confidence interval	20,600-46,686	8,996-21,824	22,699-59,630	7,459-33,892	5,727-67,288

Table 3. Dolphin fishery of Taiji, mainly of drive fishery. Catches were placed to calendar year. Quotas were allocated to calendar year (until 1995) or to fishing season starting in autumn (1996), and they were added to the starting year. The + mark indicates inclusion of years operated without quota. Bold letters indicate peak year of the catch. A: 5 years total of the drive fishery quota, B: 5 years total of the catch<sup>1</sup>. Sources: 1970-1971 from records of Taiji Fish Market (Table 3.17 of Kasuya 2017), 1972-2019 from Fisheries Agency statistics (Table 3.18 and 3.19 of Kasuya 2017, and <https://www.kokushi.fra.jp>).

Years	Risso's dolphin			Short fin. p. whale			C. bottlenose dolphin			Spotted dolphin			Striped dolphin		
	A	B	B/A	A	B	B/A	A	B	B/A	A	B	B/A	A	B	B/A
1970-74	-	58	-	-	402	-	-	123	-	-	-	-	-	5303	-
1975-79	-	9	-	-	1346	-	-	124	-	-	70	-	-	6276	-
1980-84	-	57	-	1500+	<b>2188</b>	-	-	2001	-	-	1189	-	-	<b>22476</b>	-
1985-89	-	122	-	2500	1545	62%	-	<b>3333</b>	-	-	<b>2943</b>	-	-	8484	-
1990-94	650+	865	-	1900	736	39%	1830+	2223	-	820+	1618	-	1900+	3588	-
1995-99	1500	729	49%	1500	848	57%	4450	2042	46%	2000	470	24%	2250	2102	93%
2000-04	1500	<b>1573</b>	105%	1500	493	33%	4450	2997	67%	2000	529	26%	2250	2154	96%
2005-09	1471	1436	98%	1361	799	59%	4165	1519	36%	2000	729	36%	2250	2156	96%
2010-14	1351	1290	95%	849	375	44%	3022	1019	34%	2000	600	30%	2250	2237	99%
2015-19	1260	979	78%	647	241	37%	2002	685	34%	1880	114	6%	2250	2055	91%
Total		7118			8973			16066			8262			56831	

1) These figures do not include dolphins released alive or carcasses that were found in the enclosure and discarded. TK observed that the latter were often represented by suckling calves. Catch of some early years, i.e. 1970-1976 and 1990-1992, include small number of dolphins taken by hand harpoon fishery.