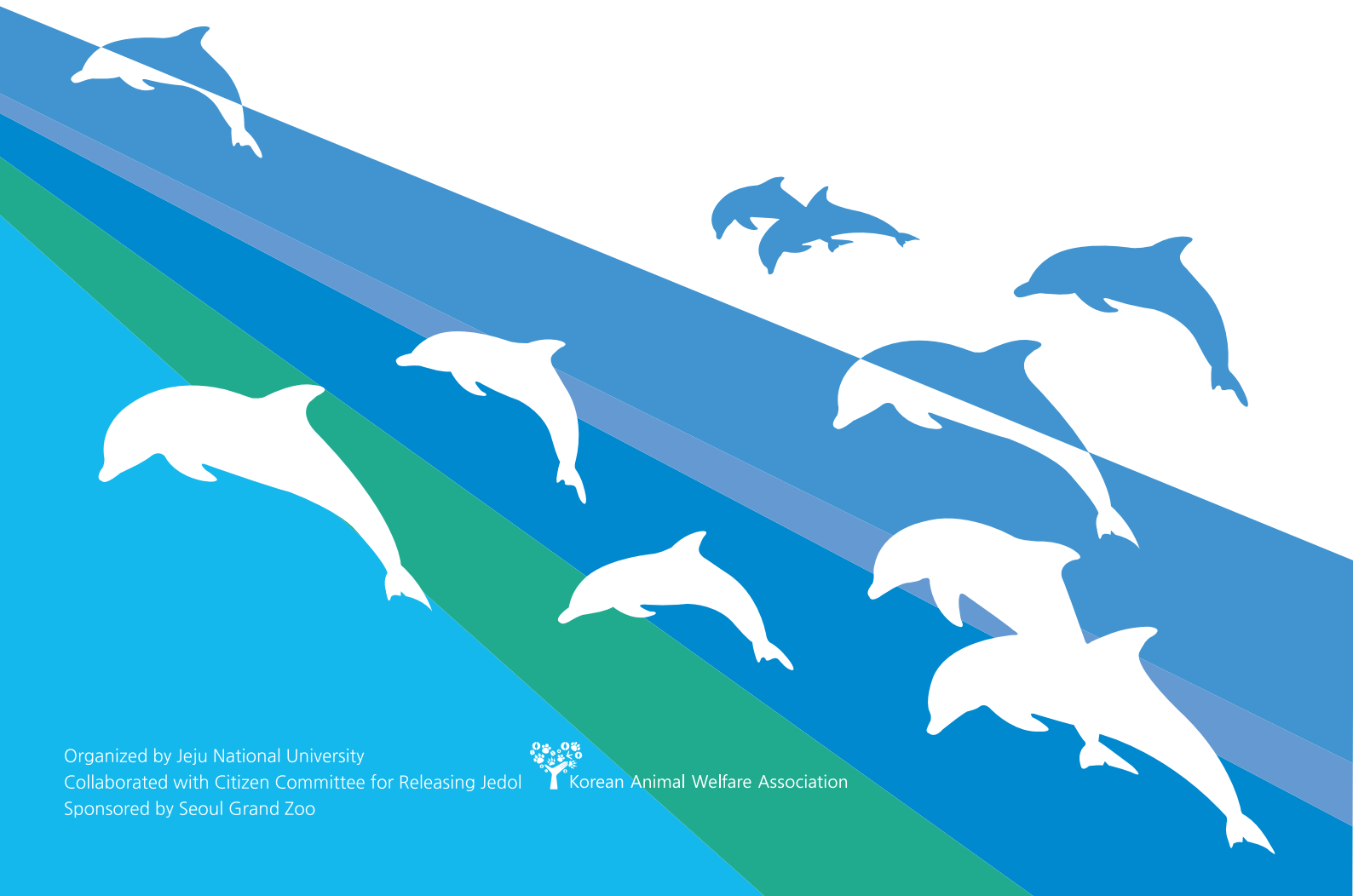
Symposium on Releasing Captive Dolphins in Korea

Date _ **June 4, 2013**

Time _ **5:00-8:00 pm**

Place _ **Room 201, ICC Jeju**



Organized by Jeju National University
Collaborated with Citizen Committee for Releasing Jedol
Sponsored by Seoul Grand Zoo

Korean Animal Welfare Association

Presentation

Opening statement
Ms. Hee Kyung Jo _ Korean Animal Welfare Association

Lessons learned from the release of long-term captive and captive born bottlenose dolphins in Western Australia
Dr. Nick Gales _ Australian Antarctic Division, Department of Sustainability, Environment, Water, Population and Communities, Australia

Health considerations for the release of captive bottlenose dolphins
Dr. Pierre Gallego _ Marine Mammal Consulting Veterinarian, G-D of Luxembourg

Captive dolphins and points to consider when planning a rehabilitation project
Dr. Naomi Rose _ Humane Society International, USA

Coffee break -

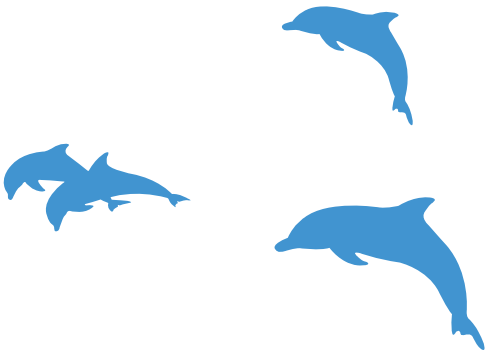
Releasing captive Indo-Pacific bottlenose dolphins into the wild in Jeju Islands
Dr. YiKweon Jang _ Division of EcoScience, Ewha University, Korea
Dr. Byung-Yeob Kim _ Department of Marine Industry and Maritime Police, Jeju National University, Korea

Behavior patterns of Indo-Pacific bottlenose dolphins in the aquarium and sea pen settings
Ms. Soojin Jang and Dr. Yikweon Jang _ Division of EcoScience, Ewha University, Korea

To free a dolphin
Mr. Richard O'Barry _ Earth Island Institute. USA

Coffee break -

Panel Discussion : Procedures and consideration for releasing three Indo-Pacific bottlenose dolphins in Korea
All speakers



Aquatic Mammals 1993, **19.2**, 49–59

The rehabilitation and release of bottlenose dolphins from Atlantis Marine Park, Western Australia

Nick Gales* and Kelly Waples**

*Department of Conservation, P.O. Box 10420, Wellington, New Zealand
**Texas A & M University, 4700 Avenue U, Building 303, Galveston, TX 77551, USA

Introduction

Bottlenose dolphins have been held in captivity for a long period of time both as display and research animals. A combination of improved reproductive rates of dolphins in captivity and a closure of facilities in response to financial and public pressure constraints have led to moves to release some dolphins back into the wild. In the future this trend may increase. To date little follow-up work has been done on released animals, and the fate of most rehabilitated dolphins is questionable.

In 1987 two dolphins, 'Joe and Rosie' were released after a period of seven years in captivity as research animals. This release project was documented in a National Geographic film 'Back to the Sea'. Unfortunately the results of this project are ambiguous as it is unclear whether or not the dolphins were ever sighted after their release. A single mature male dolphin was released from an Aquarium at Port Elizabeth Museum in South Africa and although no specific effort was made to track the animal he was sighted on several occasions post release (G. Ross, pers. comm.).

More recently a release program took place in Florida in 1990 involving two subadult male dolphins held in captivity for a period of two years and released at the original capture site. This was a successful release where the dolphins have been sighted on numerous occasions over the past 2 years post-release in their original home ranges (Bassos *et al.*, 1991). A less successful recent rehabilitation project is the 'Into the Blue' program. This project involved the release of three dolphins in the Turks and Caicos islands which was not the original capture site for any of the dolphins. The fate of these three animals is unknown as there is no substantial evidence that the dolphins were resighted at sea (McKenna 1992). This latter project has raised significant concern among the scientific community about the consequences of releasing animals at sites other than their capture site.

There are also quite a large number of examples of dolphins that have been maintained in captivity for short periods (often rescued as stranded animals) and then returned to the sea. Few, if any, of these cases were documented and thus the fate of these animals is largely unknown.

Atlantis Marine Park (AMP) was constructed in 1981 at Two Rocks, 60 km north of Perth, Western Australia. Seven Indian Ocean bottlenose dolphins, *Tursiops truncatus*, were subsequently captured between January and July 1981 from the local coastal population and were maintained as show animals for the duration of the marine parks existence. Due to a successful breeding program three viable calves were born in 1989. The closure of AMP in 1990 led to the rehabilitation and release of the captive dolphins. The following account is a report that details the attempted return to the wild of a group of captive-born and wild-born dolphins (*Tursiops truncatus*) that were held for public display at AMP for ten years and as such is the first attempt of its kind.

The dolphins

Atlantis Marine Park was built and owned by Tokyu Corporation of Japan in the Yanchep/Two Rocks area. For financial reasons AMP was closed down on 12 August 1990. Efforts to relocate the dolphins to other captive facilities were unsuccessful. In consultation with the Government Fauna authorities a decision was made to rehabilitate the dolphins back to the wild. The project was fully funded by Tokyu Corporation.

At capture in 1981, the dolphins were estimated to be between 3 to 5 years of age. The group consisted of three males and four females. All four females became pregnant in 1988, resulting in the successful births of three female calves. One adult female gave birth to a stillborn calf that year, and to an infant that survived only a few weeks the following year (see Table 1 for information on names, ages and relationships). Throughout their

Table 1.

	Name	Approx. age at time of release	Offspring
Males	Nero	14–16	Echo/Nakita
	Frodo	14–16	*
	Rajah	14–16	*
Females	Mila	14–16	Nakita/Luka
	Rani	14–16	Echo
Juveniles	Echo	3	
	Nakita	3	
	Kia	3	
Calves	Luka	2 months	

*Due to the high degree of genetic relatedness between Frodo and Rajah it was not possible to determine paternity for Kia.

captivity, the dolphins were trained in a variety of behaviours both for exhibition and general husbandry. The calves were not formally trained, but did exhibit similar behaviours to the adults on training cues.

Two adult females have died since the closure of the marine park. Both deaths were believed to be stress related involving negative social interactions among the animals. One adult male exhibited symptoms of a stress related illness for a period of eight months after the closure of the marine park. Again the stress factor was believed to involve the social dynamics within the dolphin community. We do not believe the actual closure of the park was a factor in these mortalities or illnesses. Rather the problem seemed to stem from the perturbation of a confined group of sexually mature *Tursiops* with a high proportion of males. The two remaining adult females became pregnant in the early stages of the rehabilitation project. One female gave birth to a male calf in November 1991, resulting in a total of nine animals to be released; three adult males, two adult females (one pregnant), three 3-year-old, captive born calves and one new born calf (Table 1).

The rehabilitation program

The rehabilitation program was planned to proceed in several stages after the closure of AMP. The course of action to be followed included an initial period of time in the marine park followed by movement to a sea pen constructed in the adjacent Two Rocks marina. Finally the dolphins would be taken out to sea. The rehabilitation work began while the dolphins were still housed at the marine park facility. The animals were no longer participating in shows, human interaction with the dolphins was reduced and the emphasis on training changed. A behavioural study on the captive dolphins and a survey study of the local wild population were both initiated. The captive dolphins were exposed to live fish and a reduction in the chlorine concentration in their water. Outlined below are the various rehabilitation activities that began in the marine park, the purpose for instigation and the outcome of each phase.

Captive behaviour study

Quantitative behavioural data was collected while the animals were held in the marine park for a six month period from April through September 1991. The focus of this study was to identify association patterns within the group and the nature and stability of these associations. In addition, an activity time budget was calculated for each individual. These data would serve as baseline information in order to detect changes in social patterns as well as activity throughout the program and to see if the social structure while in captivity would be the same as that found in the wild.

Preliminary results showed that each individual had a primary associate. This was seen in the tight proximity between associates, consistent synchronous breathing and the tendency to engage in activities as a unit. A secondary level of association existed in the form of subgroups. The subgroup structure became more defined over time and reached the point of complete exclusion, i.e. the dolphins remained only with their subgroup members at all times. This sharp division was brought to an abrupt and dramatic end by the establishment of a new alliance between two males from opposite subgroups (Rhind 1991). This event serves as an example that the tight bonds evident in primary associate relationships may be transitory. It was also during this time that one of the female deaths occurred and the ill male recovered. Although the presence of a primary partner seems to be an important aspect of the social structure it may also have detrimental effects.

Activity budget data showed that all animals spent an appreciable amount of time swimming and milling. The adults tended to rest more than the calves and the calves tended to engage in more socialising activities. Among the adults the males socialized more than the females (Rhind 1991). This finding could be relevant in the later stages of the release as sociability might be an important factor in the integration into a wild population.

Wild dolphin survey

An offshore survey of the local bottlenose dolphin population began in February 1991 with the

intention of continuing for the duration of the release project. The purpose of this aspect of the study was to define the population parameters in the release area in terms of population size, pod size, group structure, foraging strategies and sites and ranging patterns. These data were collected in order to have a basis for comparison with the released animals to determine whether they were adjusting adequately to the ocean environment and integrating into the local population. It was necessary to collect data on individuals to determine pod composition, details of movement and behaviour as well as to have background information on new associates of the released dolphins.

The study area covered a 38 km coastal strip 9 km wide. Surveys were run aboard a 6.7 m twin-hulled aluminium craft (Abcat, Australia Boating Manufacturers) powered by twin 90 horsepower motors (Yamaha). When weather conditions were acceptable a transect within the range was determined based on previous trials and the prevailing weather conditions. Records were kept of the duration, area covered and weather conditions throughout all surveys. For each sighting of a group of dolphins a data sheet was completed, recording location by latitude/longitude and proximity to reefs and other natural landmarks and environmental data such as weather conditions, water temperature, depth and bottom type. Group composition of the dolphins was recorded including number of dolphins present, age and sex class if determinable, group activity, spread, direction of movement, speed and dive type. In addition any behavioural comments were noted.

Photo identification of dorsal fins was used as the method to distinguish individuals (Würsig and Würsig 1977). All animals' dorsal fins were photographed using a Nikon F-4 camera with a Nikon 70–300 mm autofocus zoom lens and Fujichrome 100 film. The film was exposed at a 200 ASA setting to compensate for water glare. Slides were later analyzed to determine the presence of known individuals and to identify new individuals. This process was done by projecting the slides against a white background and closely examining the dorsal fin. If distinctive nicks or marks were present the fin was compared to the catalogue of known individuals. If it had not been previously sighted and photographed a silhouette drawing was completed by fastening a sheet of paper onto the projection screen and outlining the dorsal fin. Distinctive marks were filled in, the animal was named and added to the photo identification catalogue.

We have completed 140 group sightings. The photo-identification catalogue contains 200 individuals. A number of these individuals have been resighted several times and many have been seen with some of the same associates on more than one occasion. The average group size is 9 animals, although groups of 20 to 30 individuals are common as well as sightings of single animals and mother/calf pairs. The majority of our sightings have occurred in conjunction with a broken limestone reef system that runs parallel to the coast at approximately 1.9 and 5.7 km offshore. It is possible that these reefs represent prime foraging areas for the dolphins. A number of sightings of single animals and mother–calf pairs have occurred in shallow sandy areas, close to shore. This seems to be another foraging area. We have no conclusive information on the range of the local population, but believe it covers a larger area than our study site.

Fish trials

Live fish were added to the diet of the dolphins to expose them to gut parasites experienced by wild dolphins as well as to assess and possibly develop foraging skills. Live fish feeds were monitored on an experimental basis. Seventeen trials were run between March and September, 1991. Locally caught fish were used and included a range of benthic, pelagic and demersal species including herring (*Arripis georgianus*), whiting (*Sillago schomburgkii*), skipjack (*Pseudocaranx dentex*), wrasse (*Opthalmolepis lineolatus, Pseudolabrus peri-lus*) and sweep (*Scorpis georgianus*). During each session the animals to be fed were separated into one pool. The drains were covered with screens and the water level dropped slightly to keep fish off the lip of the pool. A number of observers were stationed around the pool and one observer with mask and snorkel entered the water. A predetermined number of fish were poured into the water on a cue at which time a stopwatch was started. The observers called out the name of any dolphin seen catching a fish and the type of fish, if possible. This information and the time were recorded. General behavioural notes of the dolphins were also recorded. The trial ended when all fish had been consumed.

The dolphins showed a marked improvement in ability to catch fish over time. All dolphins were capable of chasing and catching fish. The adults were more proficient than the captive-born calves. Among the wild-born adults the dominant animals tended to be the most aggressive and efficient in capturing live fish. The calves tended to chase for longer periods of time and had a higher rate of 'missing' fish. During the later trials the calves became competitive with each other and would all chase the same fish.

Husbandry

Throughout the time the dolphins were maintained in the marine park and the sea pen they underwent

periodic health checks. All animals were trained a variety of behaviours for these husbandry procedures and were very handleable. They were trained to allow mouth, full body, genital, blowhole and eye inspections. All dolphins were trained to slide out onto a platform scale so that regular mass readings and measurements could be taken. The dolphins were also accustomed to being placed in a sling for mass and length measurements and blood collection. A detailed discussion of the recorded weights and measurements over time can be found in Cheal and Gales (1992).

In addition to the husbandry behaviours, the dolphins were trained to respond to an underwater signal by approaching and stationing at the site of the signal. These behaviours could prove invaluable during the open ocean phase of the project as it would be possible to recall the animals to the research vessel and complete a physical examination including body weight. Unfortunately the dolphins did not respond to the underwater recall signal once out at sea.

Chloride was removed from the salt water in the dolphin pool for a period of time in order for them to develop a typical bacterial skin flora. The dolphins were monitored for any skin problems. The elimination of chlorine from their environment caused no effect. The dolphins encountered no other physical problems during the captive phase of the project.

Freeze branding

All dolphins were marked with a freeze branded number on 12 March 1991. Copper numbers, 0.05 m high were cooled in liquid nitrogen and held on each side of the dorsal fin for 30 seconds. These brands proved to be an easy means of identification over time for the research team as well as for interested public reporting sightings of the released animals. They are still easily legible 2 years later on some of the dolphins, although they are beginning to fade.

Change of environment

The movement to a sea pen was deemed a necessary step in the preparation for open ocean work for several reasons. It was seen as a halfway point between the marine park environment and the open ocean. A sea pen presented the opportunity to expose the animals to a realistic ocean environment complete with sandy bottom, limestone rock and various types of marine life, including schooling fish, all within the safety of a confined area. In addition, the sea pen represented a large increase in living area which would give the animals more space to move around as well as allow for the next phase of the training program to take place.

The dolphins were transferred on 2 October 1991 to a sea pen constructed inside the Two Rocks marina. The new enclosure covered a rectangular area 30 m by 100 m and a depth of 1 to 3 m (see Fig. 1). The pen was enclosed by limestone rock walls on all sides with a metal mesh gate wide enough to allow the research boats to enter the enclosure in the ocean-facing wall. A system of floating walkways and isolation pens were constructed in one area of the pen and were used as feeding platforms and areas of interaction. A sand beach was installed in one corner of the pen as an area to capture the dolphins when necessary for general husbandry checks. Good quality sea water was pumped into the enclosure at a turnover rate of one complete pen volume per day. This was to overcome some problems with hydrocarbons and poor turnover inside the marine. No chlorine was added to the water and water quality was tested regularly.

The dolphins made the transition to this new habitat quite easily. They were cautious at first and remained in one corner of the pen. By the end of the first week they were ranging throughout the pen. Behaviour patterns settled back into what had been seen previously at Atlantis. Some social problems that existed in the marine park pools were alleviated by the size of the new enclosure, allowing the animals to maintain a greater distance when in conflict. One male was virtually ostracized from the main group, however this did not develop into a debilitating, stressful situation as he could avoid the other animals easily. The only change within the dolphin group was the birth of a healthy male calf to Mila on 28 November 1991. This new addition caused no problems among the dolphins but led to some variation in subgroup structure.

The most important component of this phase was to train the dolphins to work reliably from boats so that they could then be taken out to sea on controlled excursions, thus making the transition to the open ocean more gradual. Three different boats were used for this exercise; a 2.5 m inflatable dinghy, a 5.5 m centre console aluminium power boat and a 6.7 m twin hulled aluminium craft. The inflatable dinghy was introduced initially to accustom the dolphins to boats. The dolphins all responded well to this phase of the project and rapidly learnt to ride the bow and wake of the boats. The underwater recall was used in conjunction with the boat training and again the response was excellent. Unfortunately neither the recall nor the boat behaviours were exhibited by the dolphins at sea. After the initial period at sea some of the dolphins would approach the boat and bow ride or follow alongside, but not consistently and not on response to the recall.

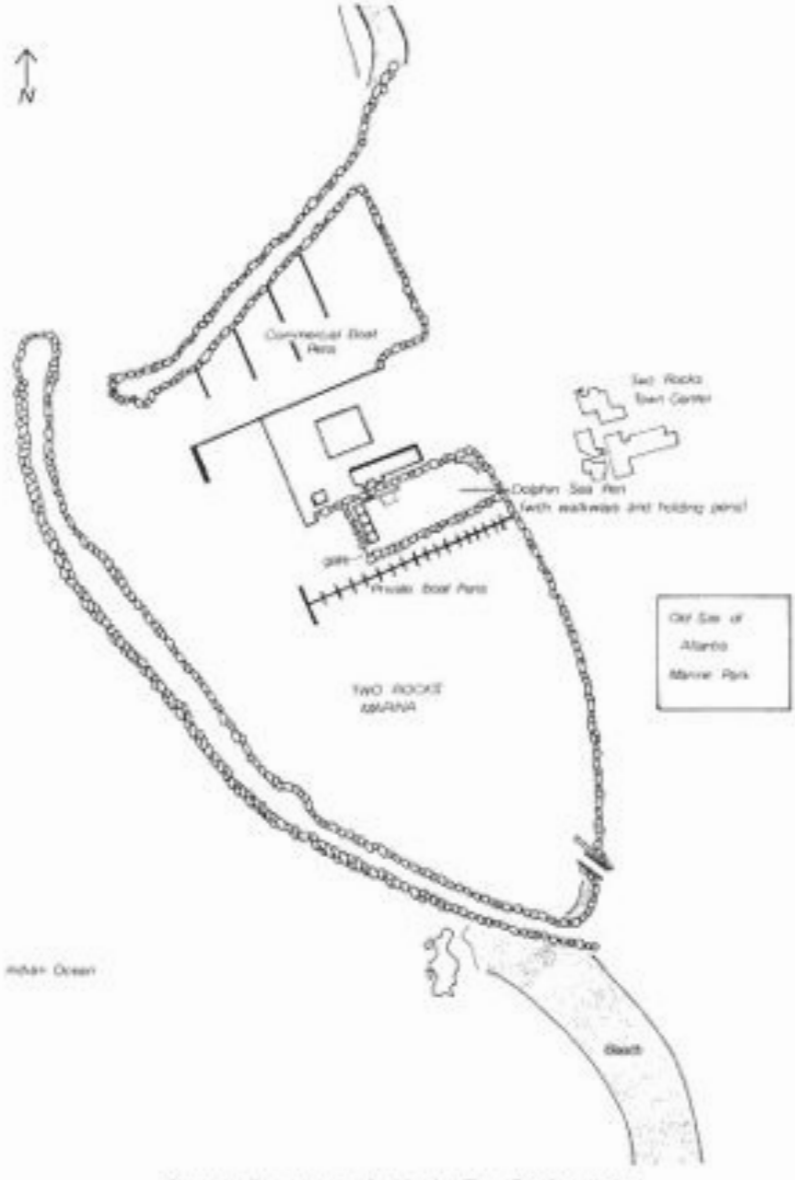


Figure 1. The sea pen inside the Two Rocks marina.

Live fish were still used as a supplement to the dolphins' diet of frozen fish. A large school of yellowtail was introduced into the sea pen in the hope that the dolphins would begin foraging for themselves. Although the dolphins seemed to take minimal notice of this school, they would chase and eat live fish that were individually thrown to them. The average size of the yellowtail in the school was approximately 0.1 m, these fish may have been too small for the dolphins to consider as a food item worth the effort of chasing.

Tags

The ability to track the dolphins was considered highly important as it would be necessary to monitor the dolphins while at sea in order to evaluate the success of the project. Radio tracking devices were attached to the dorsal fins of the five

adult animals. It was decided not to put tags on the juveniles as they were still growing and any additional stress to them could prove detrimental. Furthermore, it was expected that these animals would continue to associate with their tagged mothers.

Satellite tags were considered too large for the purposes of this exercise. Radio tags (VHF) used were model MOD 225 configuration transmitters (Telonics Inc., Arizona, USA). The tags transmitted pulses in the 151 MHz band every 0.5 seconds through a 0.15 m flexible transmitting aerial. The theoretical battery life was nine months. The components were sealed in a rectangular waterproof metal casing with a metal mounting plate soldered onto the back for attachment onto the dorsal fin. The entire unit weighed 101 grams. The receiving equipment consisted of a TR-2 telemetry receiver with a TS-1 scanner/programmer and a TDP-2 digital data processor (Telonics, Arizona, USA). All units were housed in a waterproof customized case (Sexton Photographics, Oregon, USA).

The tags were attached with two 6 mm diameter, plastic, delrin bolts through the dorsal fin. A washer of neoprene was placed between the skin surface and the metal plate of the radio tag on one side of the fin and between the skin and the nut on the other side. The point of puncture for both holes was marked on the dorsal fin, a local anaesthetic administered to the surface tissue and two holes drilled using a 6 mm laboratory cork borer. Antibiotic cream was applied to the puncture site, and the delrin bolts were inserted. A washer of neoprene was placed over the bolts on either side flush against the skin surface. The radio tag was placed on the left side of the dorsal fin and stainless steel nuts were used for attachment on both sides. As a cautionary measure the bolts were positioned through the dorsals of the three male dolphins several days before the tracking devices were attached to ensure there would be no physical complications from the procedure. No problems were encountered, and all adults were fitted with tracking devices one week prior to release.

The intention of this project was to follow the dolphins for a period of up to 9 months at sea. In order for the tags to stay on for the maximum amount of time a non-corrosive metal was used for the nuts. Part of the proposed project involved monitoring the dolphins regularly, in terms of physical assessment and complications with the attachment sites for the radio tags. The animals had been trained several behaviours that involved interaction with the research boats in order to facilitate physical checks of body condition and equipment wear. Removal of the tags at the termination of the project was planned to involve a brief recapture of the dolphins and removal of the tags. In the eventuality of dolphins not being tracked it was likely that the base of the transmitters would eventually corrode and the unit fall off.

Release

The gate to the sea pen was opened on 13 January 1992. From that time the dolphins had free access to the open sea. (See Figure 2 for a timeline of daily sightings and associations for all dolphins and Figure 3 for maps depicting the area of South Western Australian coastline where the released dolphins were sighted.) The dolphins showed no initial reaction to the removal of the gate except a reluctance to go through the gateway. All feeding sessions at this time were conducted aboard one of the research boats with the aim being to lead the dolphins through the gate and around the marina. Within the first day all dolphins had ventured through the gate and back into the sea pen several times. The most reluctant animals were the dominant male and the pregnant female, the most adventurous were the three juveniles. During each feeding session the dolphins were led further from the sea pen. There was always a point at which the animals would leave the boat and return to the vicinity of the pen, often passing through the gate.

On 14 January 1992 the lone male, Rajah, followed the research boat out of the marina, while the rest of the dolphins returned to the sea pen. Rajah left the boat once outside the marina and milled briefly in the area. He would not follow the boat back into the marina, but headed straight out to sea. Within ten minutes he had his first encounter with wild dolphins, two subadults. Rajah appeared very excited, racing in circles around the two stationary dolphins. He then left them and continued travelling southward at 13–17 kmph. Half an hour later he encountered another group of dolphins. He changed direction, joined this group and slowly travelled north with them for one hour. The group consisted of two juveniles, one adult and a mother calf pair that joined and left the group along the way. Rajah was seen associating predominantly with the pair of juveniles, engaging in social contact interactions as well as synchronously surfacing with both. Rajah seemed to have no problem keeping pace with the wild dolphins, however he was always first to surface for a breathe after a long dive, sometimes surfacing several times before the rest of the group surfaced. For an unknown reason Rajah left the group and returned to a rapid southward travel.

Due to weather conditions the research boat was forced to leave Rajah after three hours. At that time he was approximately 11 km south of Two Rocks marina and continuing southwest. The radio

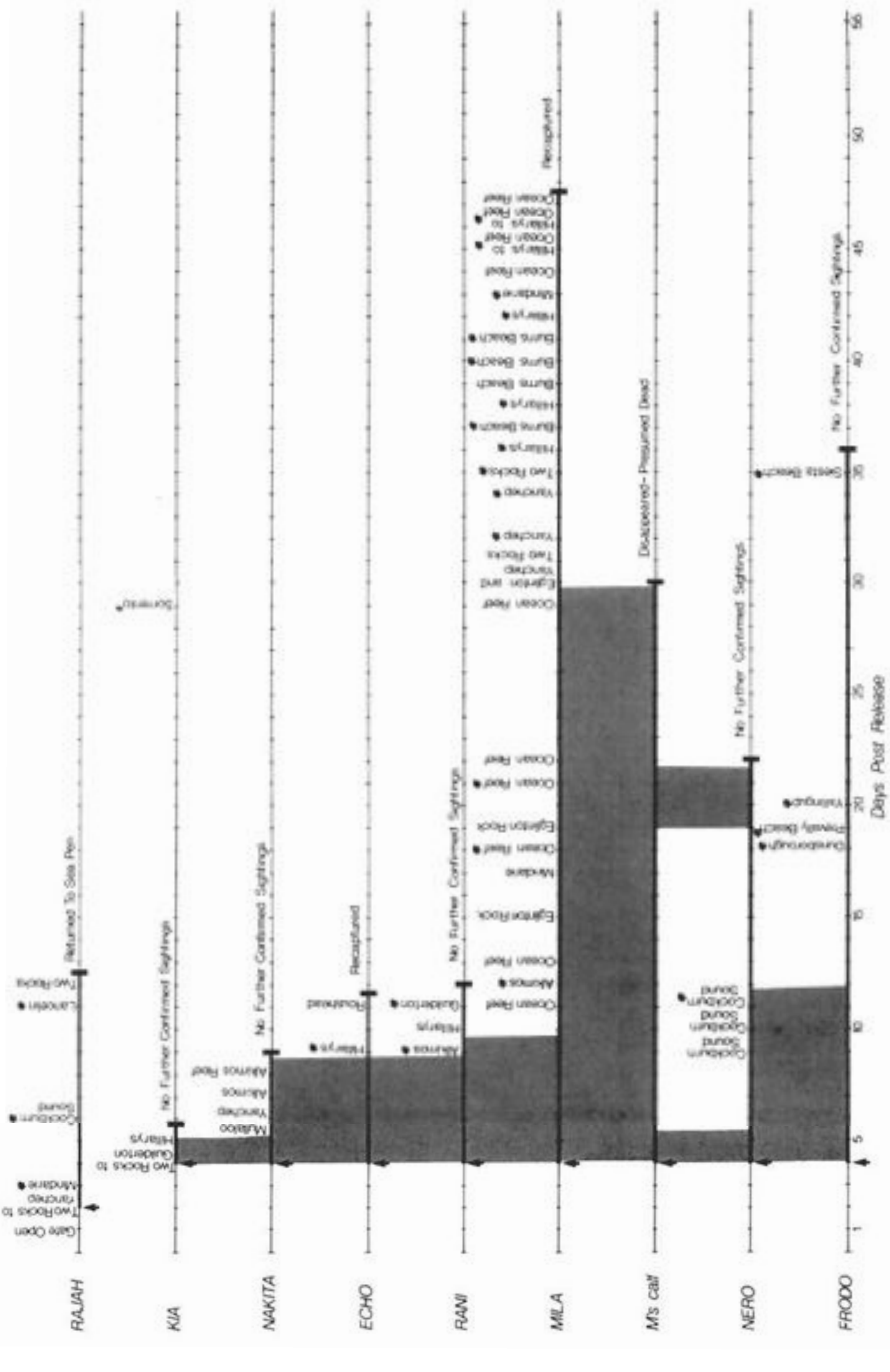


Figure 2. A timetable of each dolphin's location when sighted post-release. The shaded area denotes animals sighted in association. ★, Secondary sightings where we did not see the animal, but were confident of the source, i.e. either more than one accurate public report or a radio signal received. ○, Tertiary sightings; reported sightings where we were not confident of the validity of the report.

Figure 3a.

tracking equipment had proven successful in this initial trial. No problems had been encountered in finding or tracking Rajah and it was possible to monitor his respiration intervals.

Although Rajah was not sighted by us again at sea, we did receive reports of his movements from the public, as well as two radio tracking fixes heard during land trials which gave his general location. Over the course of four days he travelled to Cockburn Sound, some 76 km south of Two Rocks. He then changed direction and on his tenth day at sea was reported at Lancelin, 64.6 km north of Two Rocks. On the following day Rajah was located directly outside the Two Rocks marina. He

Figure 3b and c.

Figure 3. Maps covering the area of Western Australia where the Atlantis dolphins were sighted post-release.

approached the research boat with a good deal of excitement and followed the boat into the sea pen enclosure. He had lost a significant amount of weight while at sea (18 kg equalling 10.8% of his pre-release weight), evidence that he had not been foraging successfully, if at all. In addition, Rajah had a number of small cuts on his tongue, possibly the result of attempting to consume inappropriate *prey items, such as spiny fish or lobster. Based on* this information Rajah was reinstated in the sea pen with the intention of re-establishing his normal body weight and health.

The other dolphins left as a group in the early hours of 16 January 1992, four days after the gates had been removed. The group was found 3.8 km north of Two Rocks marina travelling north in a

rapid and erratic fashion. One of the juvenile dolphins (Echo) had been left behind in the marina and was caught and transported out to the group aboard the research boat. She immediately joined the group and all continued erratic travel northward for several hours to a reef 19 km north of the release site. The group slowed down at this time, milled near the reef then turned and travelled slowly south. The dolphins were no longer displaying the excited behaviour of earlier and approached the boat on several occasions for brief periods. They passed just outside the Two Rocks marina, continuing south at the end of the day.

The following day the group was located 45.6 km south of Two Rocks, near Hillarys marina. The group remained together, milling near the southern rock wall of the marina for most of the day. We received reports that the calf beached itself on several occasions and had to be helped into deeper water. By the end of the day the first split in the group occurred. The male pair—Nero and Frodo—and one of the juveniles—Kia—were no longer seen with the other dolphins. Kia was not sighted by us again, while Nero and Frodo were discovered 4 days later in Cockburn Sound. During this time the group of females and juveniles moved slightly northward and remained in a small area 15.2 km south of the original release site. They were sighted daily as a group for the following four days.

On the six day post-release the group of females split again. The juvenile, Echo, was reported alone near Hillarys marina wall, begging for fish. The following day the pregnant female, Rani, was sighted alone in the same location, signalling another group split. On the eighth day the group had fragmented completely and were dispersed over a large area. Mila and her calf remained in the Ocean Reef area. Nero and Frodo were still reported to be together in Cockburn Sound. Rani was reported at Guilderton beach. The juvenile, Echo, was found at Rous Head beach just north of Fremantle harbour. She was in poor condition and was recaptured and returned to the sea pen. She had lost 10 kg, since release, representing 8.5% of her body weight.

Rani and the remaining juvenile—Nakita—were not sighted by us after this date. There was a report of one juvenile, possibly two, with freeze branded numbers on their dorsal fins within a group of wild dolphins near Sorrento beach. This sighting was never confirmed.

Mila and her calf remained in the Ocean Reef area consistently for the following 20 days. Towards the end of this time it was evident that both were losing condition. Attempts were made to feed Mila from the research boat, however, after four weeks at sea the young calf disappeared and can be presumed dead. After the disappearance of her calf, Mila began following all boats in the area begging for fish. Her range remained within the vicinity of Hillarys to Two Rocks. During this time her radio tag failed and we were relying on reports given by local fishermen in order to find her. Although Mila was gaining some weight this choice of foraging methods in addition to her obvious decline in body condition prompted the decision to recapture Mila. Two unsuccessful attempts were made to entice Mila into a beach area and recapture her. On 28 February 1992 (44 days post-release) Mila voluntarily slid-out onto the deck of the research vessel, was restrained and returned to the sea pen to join Echo and Rajah. Mila weighed 133 kg upon return to the sea pen, showing a 23 kg loss, representing 14.7% of her body weight while in the wild. It is probable that her weight loss was greater than that shown at recapture as for the last 2 weeks at sea Mila was regularly receiving fish handouts from boats.

The male pair were last sighted together at Cockburn Sound on 23 January 1992, 9 days after leaving the enclosure. Nero was next seen on 31 January 1992 for a period of three days associating with Mila and her calf in the Ocean Reef area. Frodo was reported on the same day at Prevally beach (352 km south of Two Rocks). Over the next two weeks Frodo was reported several times in the Dunsborough to Yallingup area. The final sighting occurred on 16 February 1992 (31 days post-release) at Siesta Beach where a film crew filmed footage of Frodo interacting with people in shallow water. The film footage showed Frodo to be in fine condition. Later that day Frodo's radio signal was clearly heard during an aerial survey in the same area, evidence that his radio tag was still working properly, over six weeks after the tag was deployed.

There have been no sightings confirmed by the research team since 28 February 1992. However, on 8 March 1992 we did receive a report of a dolphin with a transmitter sighted alone near Yanchep Lagoon. More recently, we received a report of a dolphin with a transmitter seen at Cape Range National Park, Exmouth (1300 km north of Perth) on 4 September 1992 and a report of an adult dolphin with a transmitter accompanied by a calf estimated to be approximately 1 year old sighted near Wedge Island, Lancelin on 5 January 1993. Unfortunately no photographs were taken for either of these sightings and the reports cannot be confirmed. We have also received information of a sighting that took place in May 1992. This sighting involved a dolphin seen every day over a one week period interacting with people in a beach area near Carnarvon (981 Km north of Perth). There were two other dolphins seen with this individual, however neither of these animals came in close to people nor seemed to have anything on their dorsal

fins. We are confident that this sighting involves one of our released animals although photographic evidence has been insubstantial. Since the release the boat survey work has continued in the hope of finding the released animals. The study area now extends from Lancelin to Fremantle, a 120 km stretch of coastline.

The three dolphins that were bought back into captivity, Mila, Rajah and Echo, are now kept in a new enclosure at Hillarys Marina, in Perth. Care for these dolphins is provided by UnderWater World, a commercial aquarium based at Hillarys. Because these dolphins fared badly on their first attempt at rehabilitation, and because we have so little information on the fate of the remaining animals, it is not the intention to attempt a second release. Rather, these dolphins will be kept permanently in a large netted enclosure within the marina.

Conclusions

Assessing the success, or otherwise, of this project is a difficult task. Clearly there are two possible scenarios at each end of a spectrum. One is that all the dolphins that were not returned to a captive environment died, the other is that they all managed the transition and are now a functional part of the wild dolphin population. The truth probably lies somewhere between. The major reason for the ambiguity of the results was our inability to effectively track the dolphins whilst they were at sea. The VHF radio tags we used were reasonably effective initially, however, they were short-lived and only effective over a short range. It is thus imperative that more advanced and appropriate technology be tested and used in future marine mammal release programs. Our program clearly demonstrated that the transition from captivity to the wild for long-term captive and captive born dolphins is a difficult one, even following considerable preparatory efforts. If the distances travelled by these dolphins are indicative of what might be expected in other such experiments, then we believe it is inappropriate to release any dolphins in the future without a small satellite and VHF tracking capacity. It is certainly inappropriate to release any dolphins without a capacity to find and follow them.

There are undoubtedly some aspects of this release that we would change with the benefit of hindsight. For example, it may have been prudent to have provided more control over the initial access the dolphins had to leave the enclosure for the first time. Perhaps the gate should not have been left open as early as we did. However, every project is constrained by different factors. In our case we were constrained by: a lack of alternatives other than the release of the dolphin group, a set budget and time frame for the project, and a lack of previous data on which to base our strategy. Perhaps our experiences will at least reduce the latter obstacle for future release projects (if they are indeed appropriate).

It is important to note that this program was not based on the premise that a dolphin is necessarily better off in the wild than in appropriate conditions in captivity. Rather, there were not any realistic alternatives for this dolphin group beyond a release attempt. Releases of dolphins from other facilities in the world will likely occur. However, it may not be the most humane approach for those dolphins and, if undertaken, should be run as a careful scientific experiment with realistic alternatives for those animals that do not manage the transition.

References

Bassos, M. K., Wells, R. S. & Norris, K. S. (1991) Assessment of the Readaptation to the Wild of Two Young Male Bottlenose Dolphins After Two Years in Captivity. Abstract from the Ninth Biennial Conference on Marine Mammals, Chicago, IL. 1991.

Cheal & Gales (1992) Growth, Sexual Maturity and Food Intake of Australian Indian Ocean Bottlenose Dolphins, *Tursiops truncatus*, in Captivity. *Aust. J. Zool.* **40**, 215–223.

McKenna, V. (1992) Into the Blue. The Aquarian Press, London.

Rhind, S. (1991) A Quantitative Study of the Behaviour of Captive Bottlenose Dolphins (*Tursiops truncatus*). Honors thesis, Murdoch University.

Würsig B. & Würsig, M. (1977) The Photographic Determination of Group Size, Composition and Stability of Coastal Porpoises (*Tursiops truncatus*). *Science*, v. 198, No. 4318.

Dr Pierre GALLEGO

HEALTH CONSIDERATIONS FOR THE RELEASE OF CAPTIVE BOTTLENOSE DOLPHINS


LIFE HISTORY
CLINICAL HISTORY
INDIVIDUAL BASELINE


WHICH DISEASES TO SCREEN FOR?
POTENTIAL FOR MASS DIE-OFFS
DEPENDS ON THE TARGET POPULATION


MORBILLIVIRUS
BUT ALSO
ERYSIPELAS AND BRUCELLA

MORBILLIVIRUS

Potential for extensive die-offs in naive populations

Pneumonia, encephalitis and immunosuppression

Virus isolation or antibody titers (C-ELISA)

ERYSIPELAS

2 different clinical diseases

ELISA or microtitration agglutination testing

High or increased titers: follow serological evolution

BRUCELLA
Abortion, reproductive tract lesions, brain lesions
C-ELISA using B. abortus
If higher titers --> still active infection

FINAL DECISION IS LEFT TO THE VETERINARIAN
based on clinical background, lab results, and vet's interpretation


THANK YOU FOR YOUR ATTENTION!

Captive Dolphins and Points to Consider When Planning a Rehabilitation Project

Naomi A. Rose, Ph.D.
Senior Scientist
Humane Society International
4 June 2013

It is important to understand the life history characteristics and ecology of small odontocetes, such as *Tursiops aduncus*, in order to put the challenges of returning these species to the wild in context.

Odontocete Life History and Social Dynamics

- Long-lived – some species have a maximum life span of 20-25 years, others 80-90 years
- Long dependency period for offspring – in some species, dependency on the mother is 4-8 years; in some killer whales, it is a lifetime
- Cultural transmission – much of what odontocetes know about e.g., foraging techniques, migration, social dynamics, even communication, is passed on through generational learning
- Parental care – maternal behavior is not instinctive and must be learned – some species show alloparental care ("baby-sitting")

Small Odontocete Ecology

- **Socially complex – in some species, such as killer whales or pilot whales, family members remain together for a lifetime**
- **Intelligent – many species are known to have long memories and sophisticated cognition, and bottlenose dolphins at least are self-aware**
- **Far-ranging – some species live in the open ocean, some along coasts or on the continental shelf, but regardless, most can travel up to 60-100 miles in a day**

Small Odontocete Ecology

- **Variable diets – Some specialize on certain prey species, others have "catholic" diets**
- **Variable distribution – Some species have limited distribution (e.g., belugas – Arctic only), others are "cosmopolitan" (killer whales – found from the poles to the equator)**
- **Variable home ranges – Some species maintain very large home ranges (hundreds of square kilometers), others are more limited (tens of square kilometers)**

Rehabilitation and Release

Why reintroduce captive animals to the wild?

- As part of a comprehensive conservation effort for an endangered or threatened species
- To increase genetic diversity when a population is small
- To repopulate an area where a species has been extirpated
- To develop methodologies or technologies that will contribute to the above goals
- As an option in captive population management
- To enhance the welfare of the individual animals in question

Rehabilitation and Release

Factors that are important when evaluating individual dolphins for release

- Good health, no signs of disease
- The shorter time spent in captivity, the more suitable an animal is as a candidate
- The older at capture, ditto
- Known origin (country/capture site)
- Sheltered release site (sea pen)
- Local, natural food source (live fish)
- Commitment from local area to the reintroduction

All of these appear to be present in this case

Rehabilitation and Release

Factors that are important during rehabilitation

- Ethograms should be created and systematic behavioral observations made to determine if dolphins are returning to more normal activity budgets, dive times, etc.
- Dehabituation to boats and people should be introduced gradually
- Ability to catch live fish should be demonstrated

Rehabilitation and Release

Factors that are important after dolphins are released

- Monitoring is key – a minimum of three months with one year the ideal
- Tagging is preferred – a small radio/satellite tag attached to the dorsal fin
- (Semi-)permanent marking ideal, e.g., freeze-branding the dorsal fin (so animal can be monitored by informal sighting network long-term)
- An informal sighting network is helpful and preferred, but dedicated sighting efforts should also be undertaken

Rehabilitation and Release

Successful Efforts

- Misha and Echo – Florida
- Flipper – Brazil
- Joe and Misha – Turkey
- Keiko – Iceland and Norway
- Bahama Mama – Caribbean

One year of confirmed independent living is the ideal. However, if a dolphin is unable to sustain itself independently, but is healthier and more active in a semi-independent state, the project should be considered successful.

QUESTIONS?

Releasing captive Indo-Pacific bottlenose dolphins into the wild in Jeju Islands

Yikweon Jang[1] and Byung-Yeob Kim[2]

[1]Ewha University, Korea
[2]Jeju National University, Korea

이화여자대학교
EWHA WOMANS UNIVERSITY

Releasing dolphins in Jeju Island

“It is not only a matter of one dolphin going home but a matter of the relationship between animals and humans, between Mother Nature and humans." Park Won-Soon, the mayor of City of Seoul

Non-Governmental Organizations

- Korean Animal Welfare Association
- HotPink Dolphins
- Korean Federation for Environmental Movement

Source: 황현진

Indo-Pacific bottlenose dolphins

- *Tursiops aduncus*
- grow to 2.6 m long, and weighs up to 230 kg
- live in the nearshore zone around the world, except for the A rctic and Antarctic.

In Jeju Island

- 114 – 120 individuals
- vulnerable to problems associated with local fisheries

Distribution of Indo-Pacific bottlenose dolphins (2008-2010)

Timeline of captured dolphins

Date	Event
Nov 2007	First photographic documentation (ID : JBD 009) by the Cetaceans Research Institute
2009 - 2010	Dolphins were caught and illegally sold to “Pacificland” in Jeju
Jul 2009	Jedol was transported to Seoul Grand Park and trained for a dolphin show
Jul 2009 – Mar 2012	Jedol performed at the dolphin show until the Mayor of Seoul announced the release plan
Jul 2011	The NGOs began protesting for the release of dolphins
May 2012	A court order for the release of dolphins. Pacificland immediately lodged an appeal for a higher court
Jul 2012 – May 2013	Jedol underwent through a rehabilitation program.
Mar 2013	the Supreme Court of Korea upheld the decision of releasing show dolphins of a private company

Citizen committee for releasing Jedol

- assessment of Jedol's status at Seoul Grand Park
- designing of a sea pen in Jeju
- health
- rehabilitation schedule
- post release monitoring
- external relations
- scientific research

Dolphins in Pacificland

- Dolphins live in facilities with poor water quality, no natural light and high levels of noise.

<u>April 8, 2013</u>

- Chunsam and Sampal → the sea pen in Seongsan
- Boksoon and Taesan → Seoul Grand Zoo

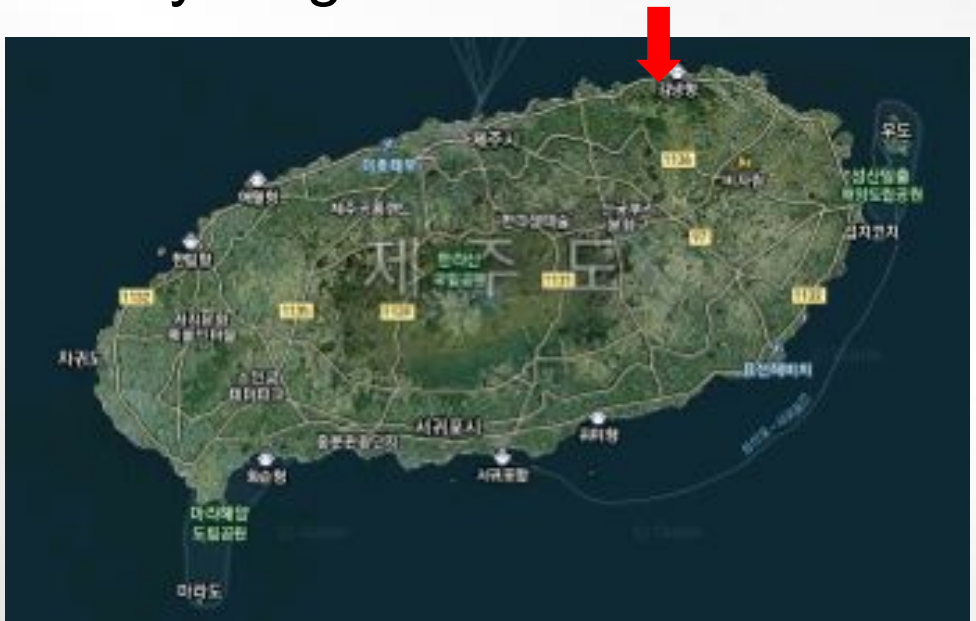
Sea pen in Seongsan

- It is a temporary facility before the sea pen in Gimnyeong is completed.
- It is located in the port of Seongsan
- Chunsam and Sampal were transferred on April 8, 2013
- Jedol was transferred on May 11, 2013

The release plan

Date	Event
Apr – mid June	Rehabilitation in the sea pen in Seongsan
mid June	Transfer of dolphins to the sea pen in Gimnyeong
mid June to mid July	Rehabilitation in the sea pen in Gimnyeong
mid July	Release
mid July -	Post-release monitoring

Gimnyeong coast



Protection act of marine mammals

Whom, finding any cetacean, stranded or captured as bycatch, should report to the chief of the marine police immediately. In case the animal would still be alive all possible measures should be taken towards the rescue of the animal and its rehabilitation.

(Notification 10 of the Ministry of Food, Agriculture, Forestry and Fisheries: Conservation and management of cetacean resources)

Indo-Pacific bottlenose dolphins have long been designated as a protected marine species, in accordance with the Law on Conservation and Management of Marine Ecosystems, and one cannot exploit this natural resource without permission.

No specification about the parties responsible for releasing marine mammals.

➡ Citizen committee for releasing Jedol

Release categories

RELEASABLE

- no significant concerns related to likelihood of survival in the wild and/or risk of introducing disease into the wild population
- the animal meets basic historical, developmental, behavioral, ecological, and medical release criteria

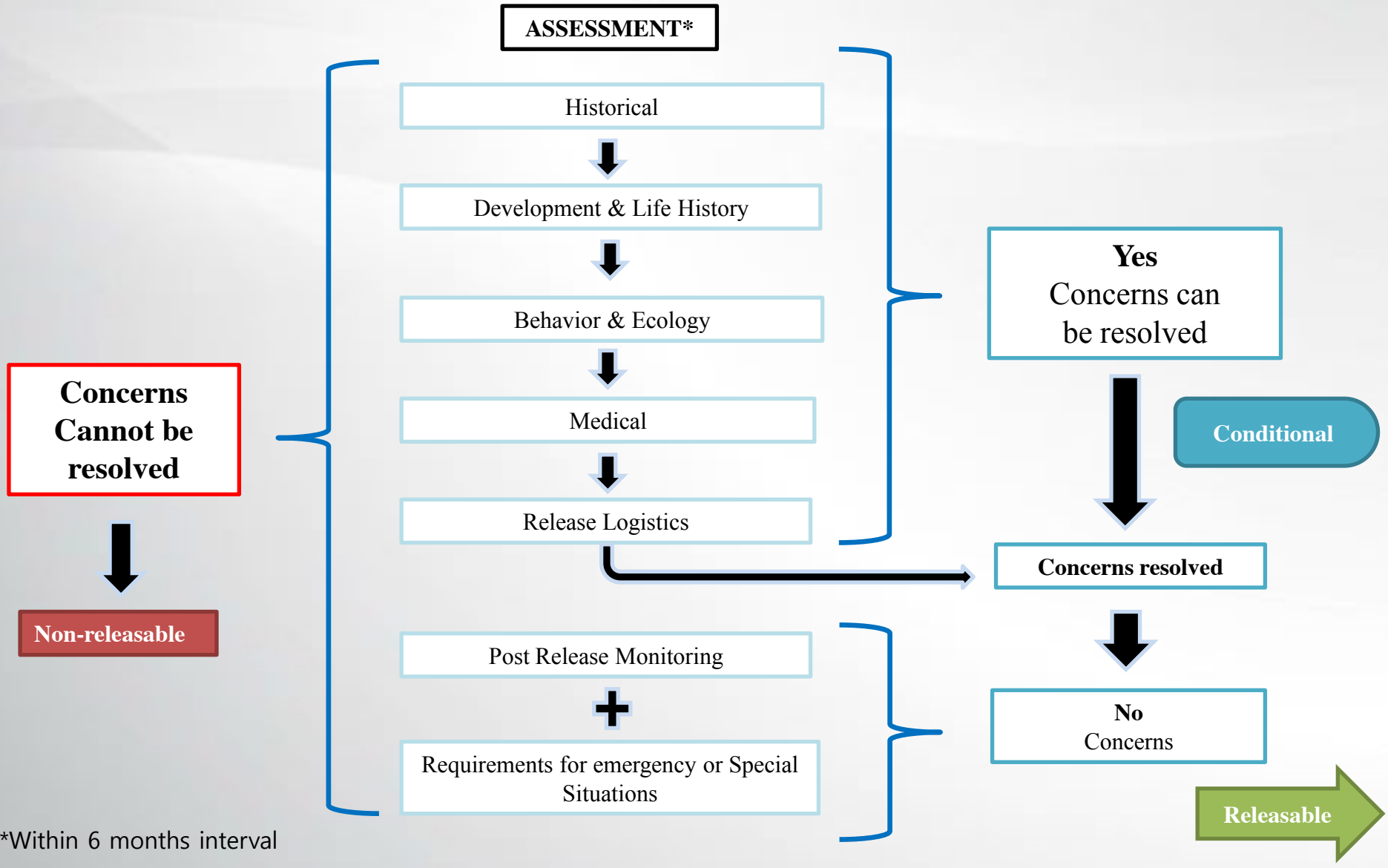
CONDITIONALLY RELEASABLE

- concerns on any of the criteria
- requirements for release cannot be currently met but may be met in the future
- more time

NON-RELEASABLE

- significant concerns
- little chance for survival in the wild and/or a diagnosed health risk
- animals that have been in rehabilitation for more than two years
- no appropriate release site or no post-release monitoring plan

Assessment process for the release



*Within 6 months interval

Historical assessment

Categories	Evaluation
1. A record of previous stranding	No
2. Ongoing epidemic among marine mammals	No evidence of epidemics
3. Location of capture and home range	Returning to the native home range
4. Exposure to other wild or domestic animals	No
5. Was transferred from another holding, triage or rehabilitation facility	No
6. Is evidence of part of a human interaction or criminal investigation.	Cleared
7. Part of a mass standing	No

Developmental & life history assessment

	Evaluation
1. Sufficient age to be nutritionally independent	Yes
2. A mother-calf pair	No
3. Signs of advanced age	No

Behavioral & ecological assessment

Categories	Evaluation
1. Breathing, swimming and diving	Good or close to good
2. Aberrant behavior	No
3. Auditory and visual acuity	Good
4. Prey capture	Good or close to good
5. Predatory avoidance	Good or close to good
6. Social factors	Generally good

Medical assessment

Categories	Evaluation
1. Health status deemed appropriate for release	Good
2. diseases that post a significant morbidity or mortality ris k to wild populations	No
3. free of drugs excluding sedatives used for transport	Good

<u>The most recent medical examination on April 19, 2013</u>

- Examination with the naked eye
- Cytological test: fistula, stomach, colon
- Aerobic bacterial cultures: *Pseudomonas* sp, *Vibrio parahaemolyticus*, *Escherichia coli*
- serum banking
- Virus: Morbillivirus (CMV), Poxvirus, Papillomavirus, Herpesvirus

Post-release considerations

Post-release monitoring

- Monitoring based on satellite tracking: first six months after release
- Monitoring based on visual identification: at least a year, possibly more.

Emergency or special situations

- maintaining the sea pen in Gimnyeong after release
- bycatch in a pound net
- stranding

Jedol with a satellite transmitter

References and Acknowledgment

- Dr. Naomi Rose
- Mr. Ric O'Barry

- Box, H. O. 1991. Training for life after release: Simian primates as examples. *Symp. Zool. Soc. Lond.* 62:111-123.
- Brill, R. L. and Friedl, W. A. 1993. Reintroduction to the wild as an option for managing Navy marine mammals. U.S. Navy/NRAD Technical Report 1549. Naval Command, Control and Ocean Surveillance Center, San Diego, CA 92152. 86 pp.
- Gales, N. and Waples, K. 1993. The rehabilitation and release of bottlenose dolphins from Atlantis Marine Park, Western Australia. *Aq. Mamm.* 19:49-59.
- Shane, S. H. 1990. Behavior and ecology of the bottlenose dolphin at Sanibel Island, Florida. In *The Bottlenose Dolphin* (S. Leatherwood and R. R. Reeves, eds.). pp. 245-265. Academic Press, San Diego.
- U.S. National Oceanic and Atmospheric Administration and U.S. Fish and Wildlife Service. 2006. Best practices of Marine Mammal Stranding Response, Rehabilitation, and Release.
- Wells, R. S. 1990. Final report on scientific research permit no. 642 to Assistant Administrator for Fisheries, NOAA, Silver Spring, Maryland. December 29. 8 pp.
- Well, R.S., Bassos-Hull, K., and Norris, K.S. 1998. Experimental return to the wild of two bottlenose dolphins. *Mar. Mamm. Sci.* 14: 51-71.

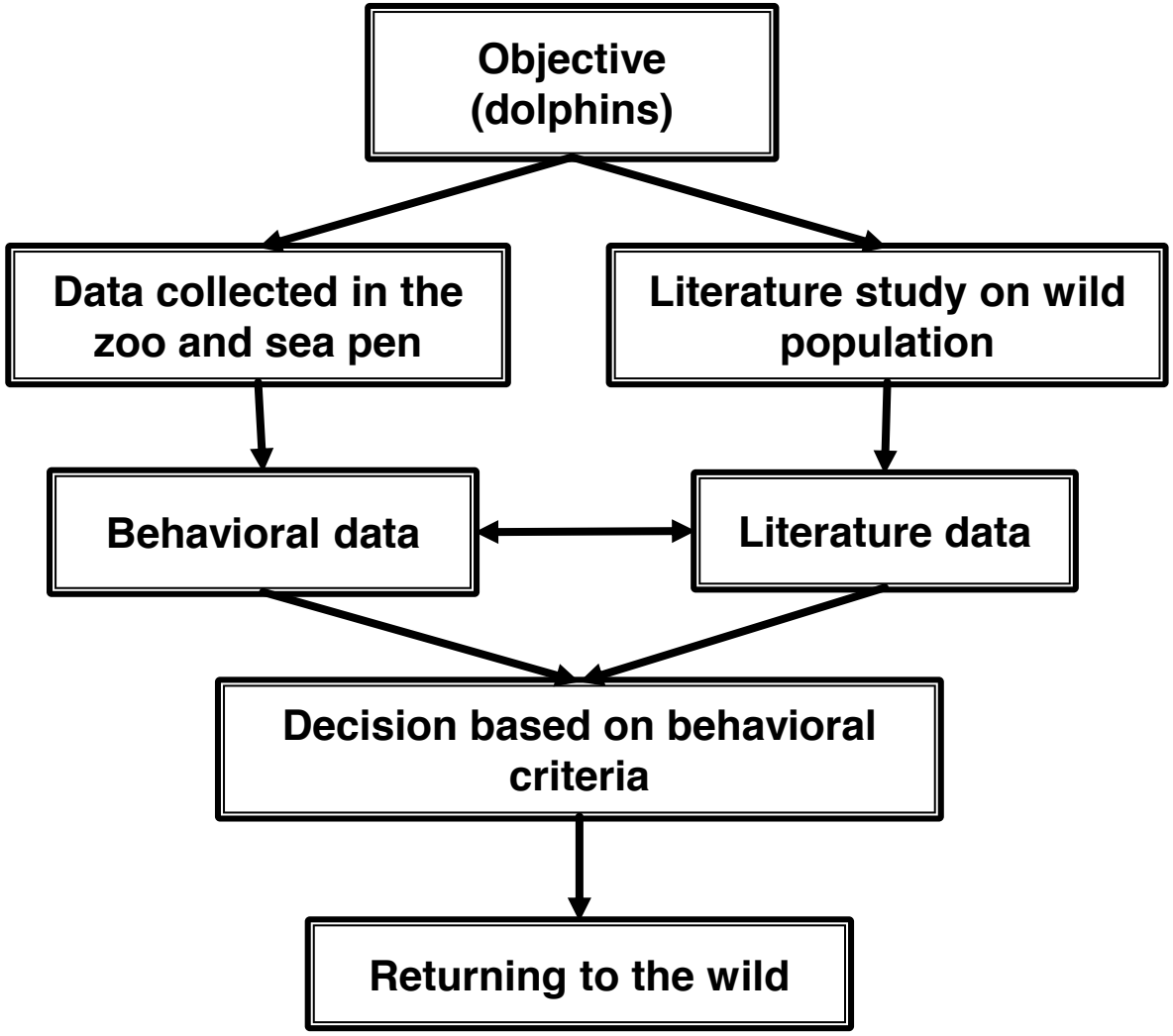
Behavior patterns of Indo-Pacific bottlenose dolphins in the aquarium and sea pen settings

Soojin Jang and Yikweon Jang
Division of EcoScience, Ewha University

Research purposes

- Comparing behaviors of 3 indo-pacific bottlenose dolphins in different environments
- Developing criteria for releasing dolphins
- Monitoring aberrant or stress-related behaviors in the sea pen → on-site quick response

Research process



Individuals for observation

- Jedol (*T. aduncus,* male, 14 yr)
  - Captured in 2009 in Jeju island
  - Associated with 3 other dolphins in Seoul Grand Zoo

Jedol

- Sampal (*T. aduncus,* female, 10~12 yr) and Chunsam (*T. aduncus,* female, 13 yr)
  - Captured in 2009 - 2010 in Jeju island

Sampal

Chunsam

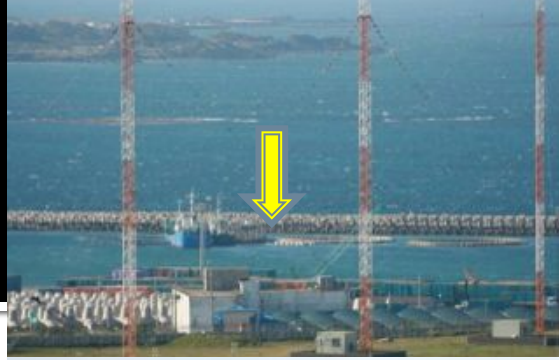
Method in the aquarium

- Focal individual: Jedol
  - Sampal and Chunsam are not allowed.
- Observation: Dec 2012 - April 2013
- 3 days per week (Mon, Wed, Fri)
- 3 times per day
  - 90 min per session : 10:00 - 11: 30
    14:30 - 16:00
    17:30 - 19:00

Behaviors observed in the aquarium

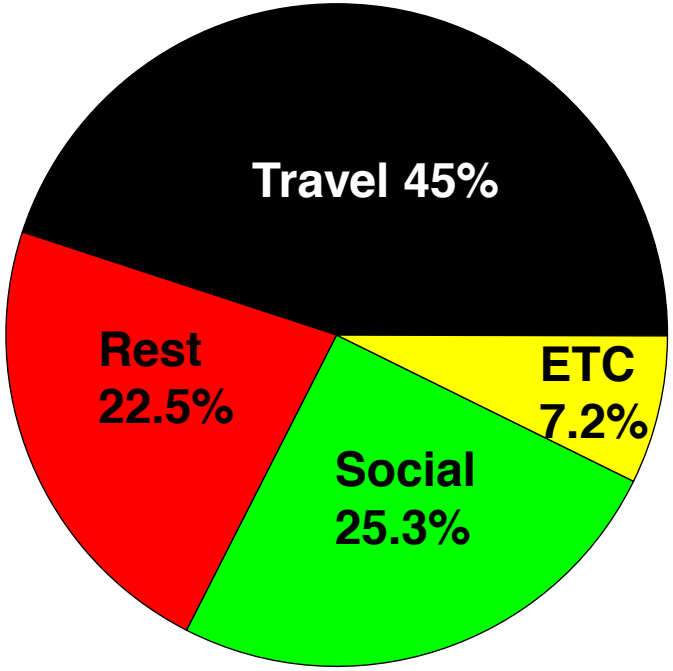
Category	behavior
Travel – swim and aerial behavior	Swim (Depth / direction / posture / synchronicity / formation / duration) Leaping, jumping, breaching, spyhopping, lobtailng, slapping, peduncle throw, tail walk Breathing, bubble blow
Rest	Surface rest, bottom rest, swim rest
Social – sexual and aggressive behavior	Penis out, rub genital tank object, attempts intercourse others Threat(open mouth or shaking head), bite, chase, ram, hit, body slam, pin, flinch, flee, assist tank mate, presentation of the belly, touch rostrum, prostrates across other's rostrum
Feeding	Response to live fish, duration of feeding
ETC	Tank rubbing, water spraying, landing, reaction to human, push tank object, play with object

Method in the sea pen



- Observation period
  - Sampal & chunsam – from April 8th to release
  - Jedol – from May 11th to release
- Non-feeding observation
  - Focal individual sampling
  - Everyday from 08:30 to16:00
  - Each observation session is between 5 – 15 min
  - More than 40 min of observation per day for each individual
  - Duration and frequency of each category and behavior
- Feeding observation
  - 20 – 60 min per session
  - There are one to four sessions per day throughout the day
  - Moving and chasing ability, desire for food, feeding intake

Daily activity budget of Jedol in the zoo (Feb ~ April)



Activity budget based on frequency

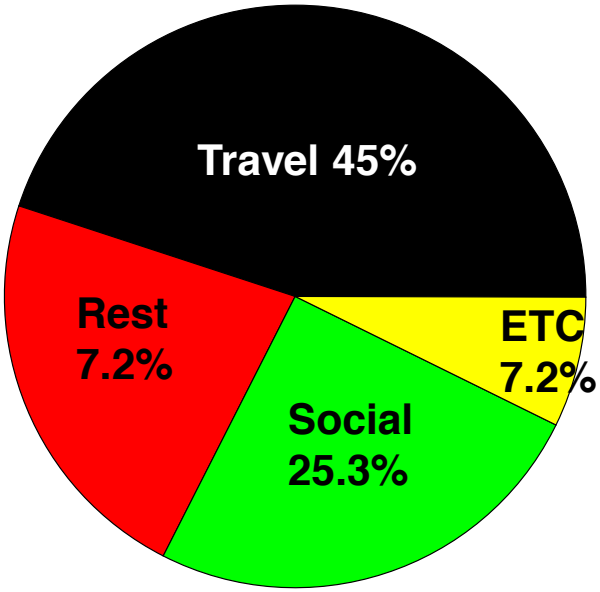
Descriptive statistics of behaviors

Behavior	Mean ± SD
Breathing (/min)	1.93 ± 0.28
Dive duration (s)	34 ± 8.69
Surface rest (%)	30.48 ± 12.65
Swim Synchronicity (%)	6.61 ± 4.09
Reaction to human (score)	0 - 2

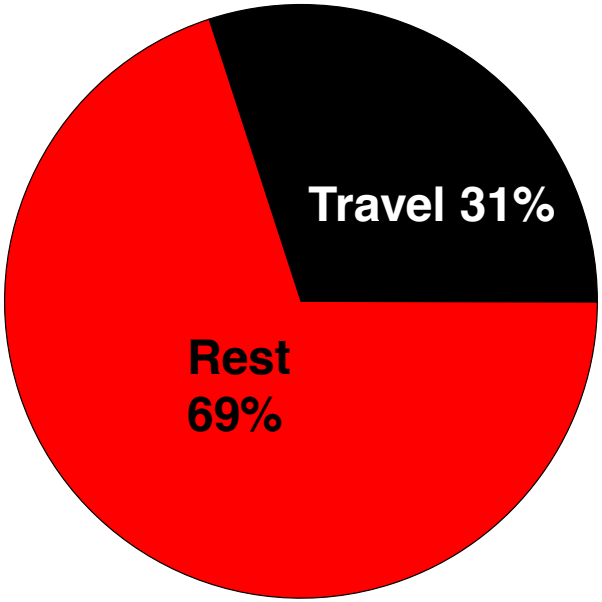
The activity budget of Jedol seemed to be intermediate between the wild populations and the aquarium individuals without performance.

Comparison of activity budgets

- Jedol with other dolphins

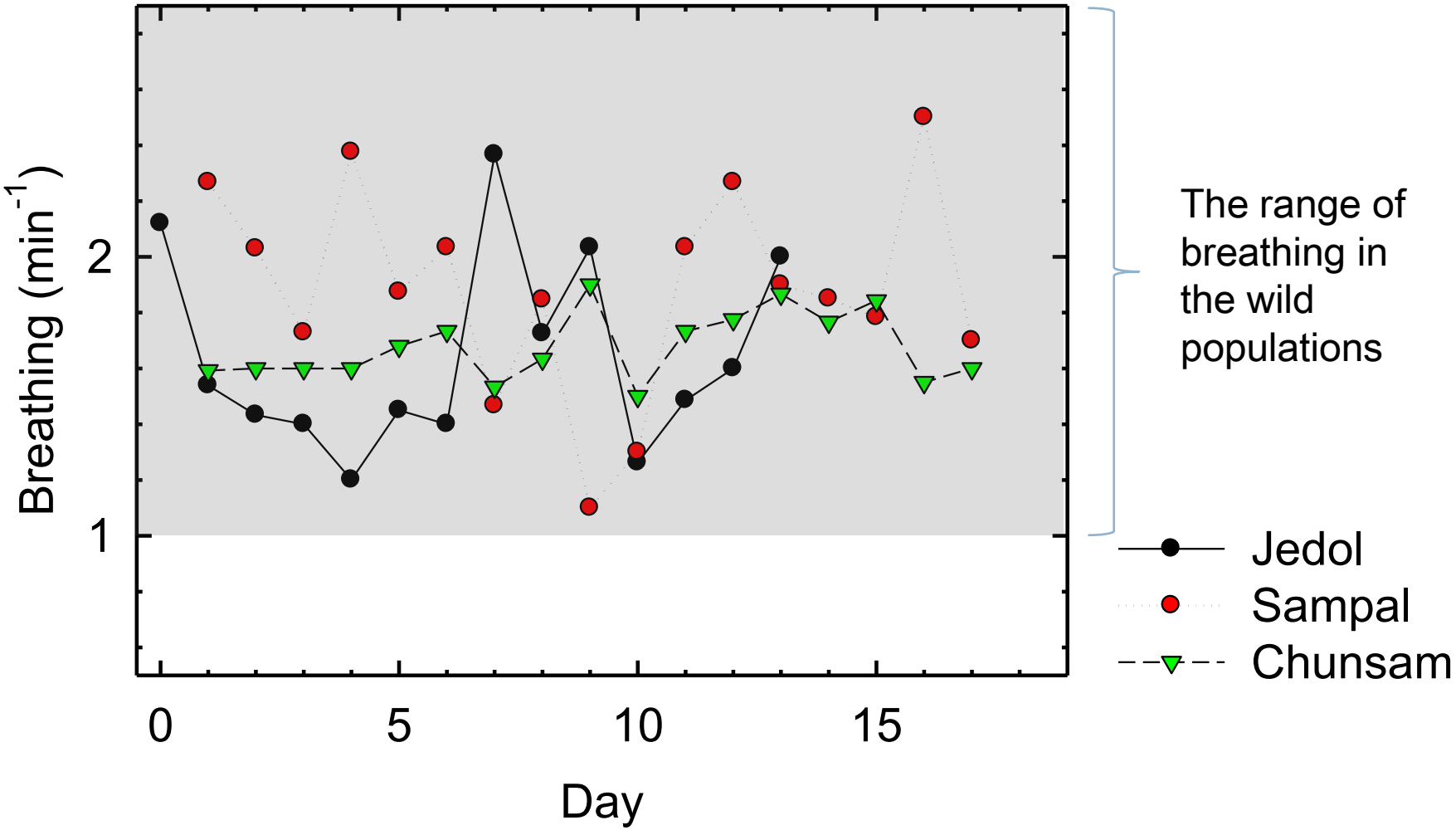


- Jedol alone

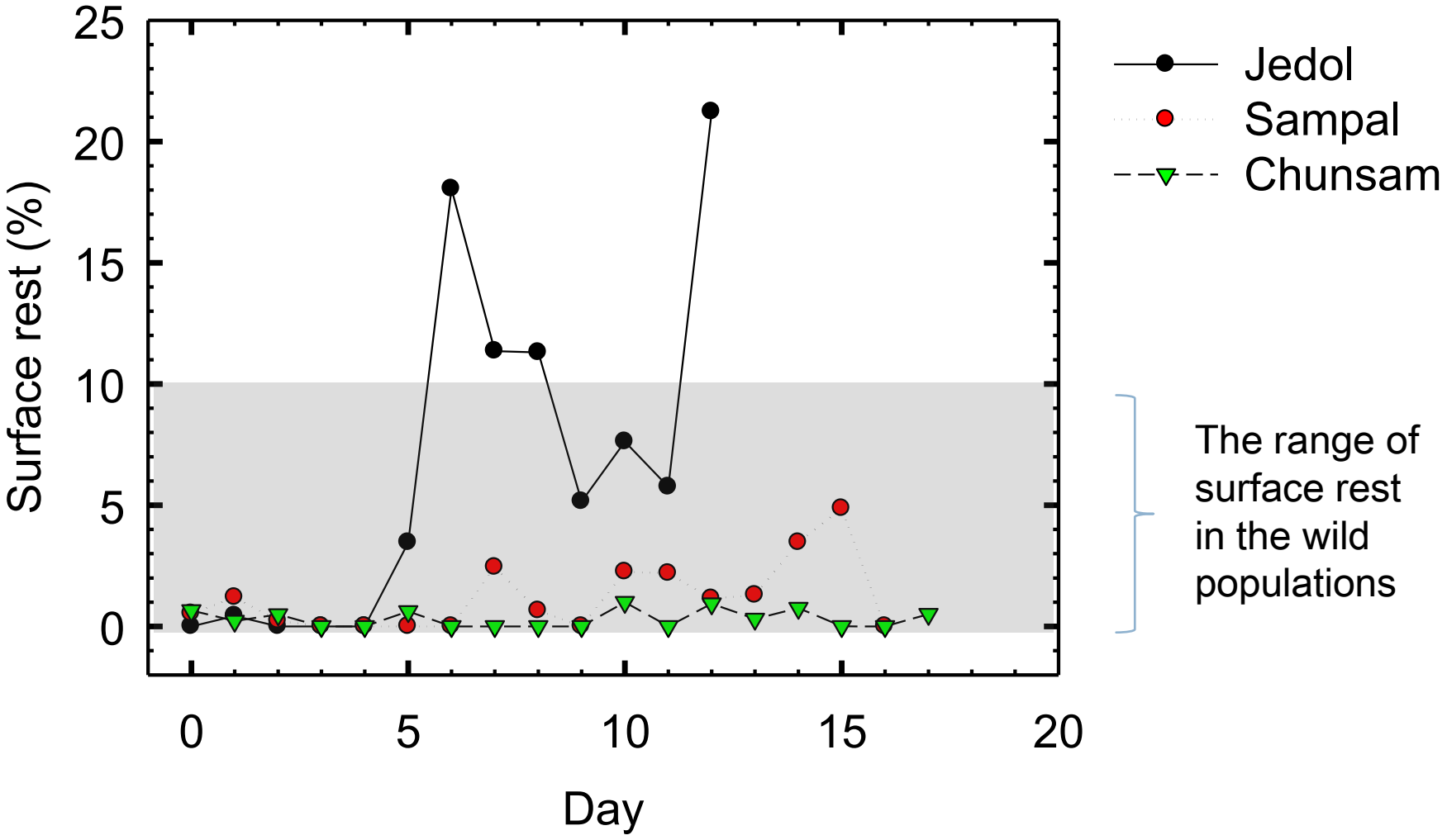


When Jedol was alone, the % of rest increased beyond the sum of % of rest and social categories.

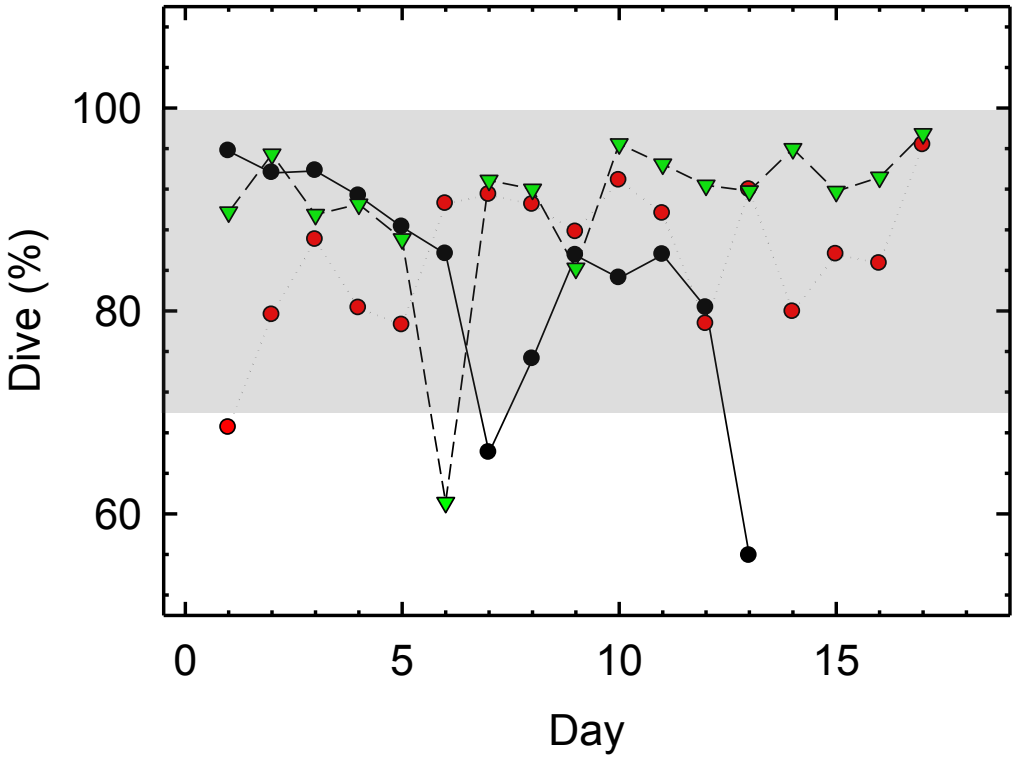
Breathing in sea pen (May)



Surface rest in sea pen (May)



Diving in sea pen (May)



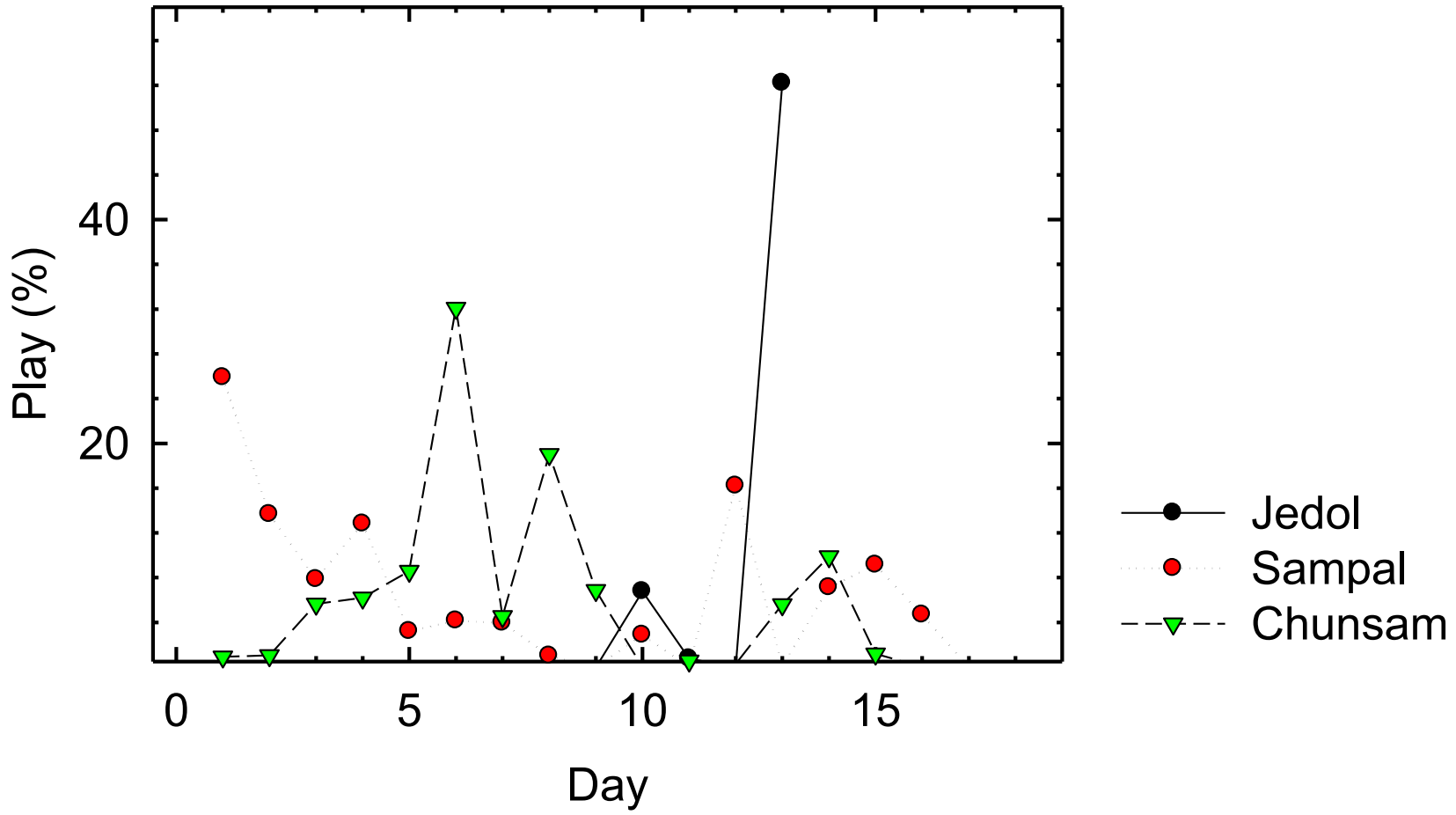
The range of diving rate in the wild populations

Jedol
Sampal
Chunsam

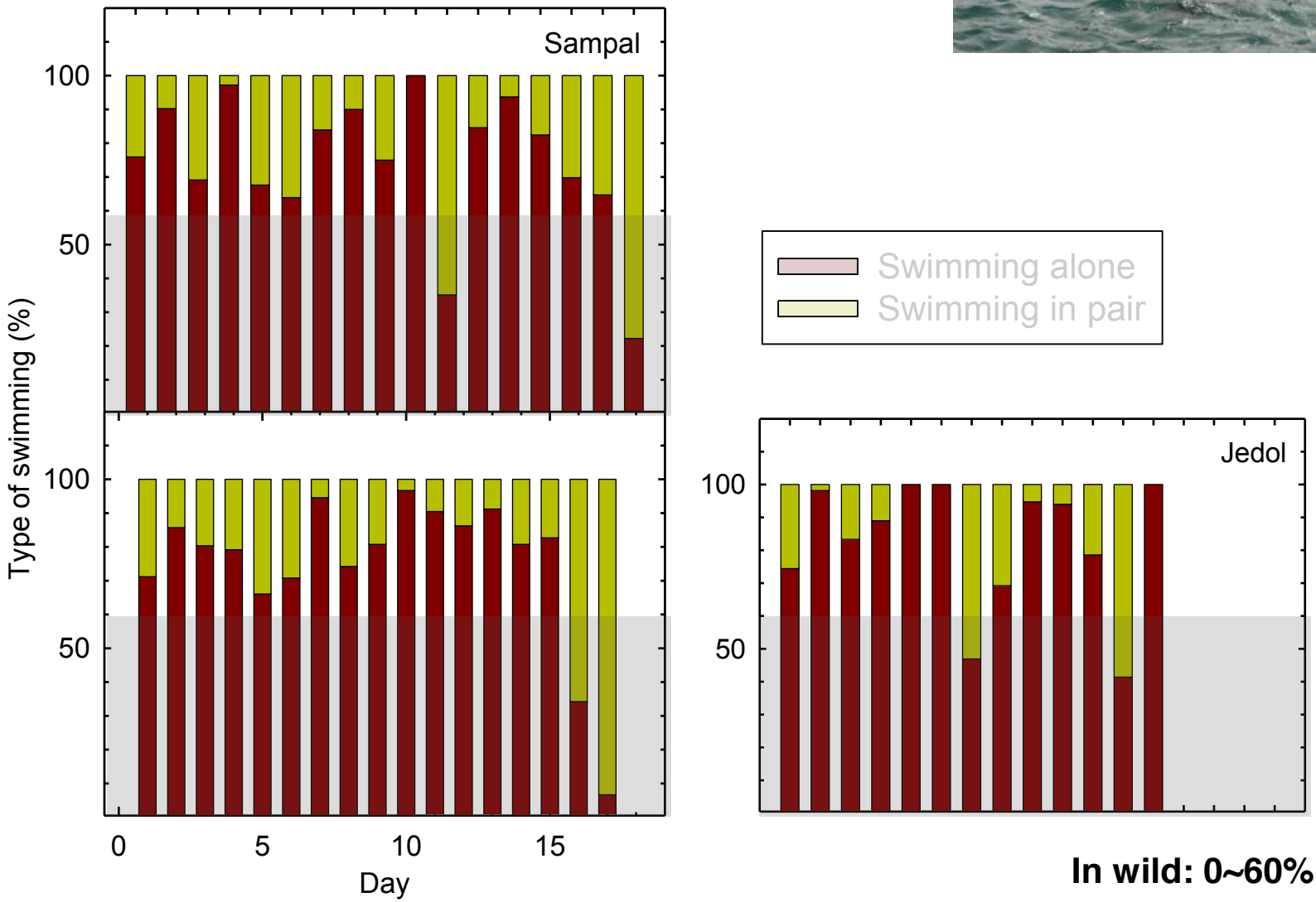
Individual	Dive duration (s)
Jedol	40.09 ± 7.59
Sampal	34..77 ± 6.85
Chunsam	37.89 ± 4.45

In wild: 20-40 s when active

Play in sea pen (May)



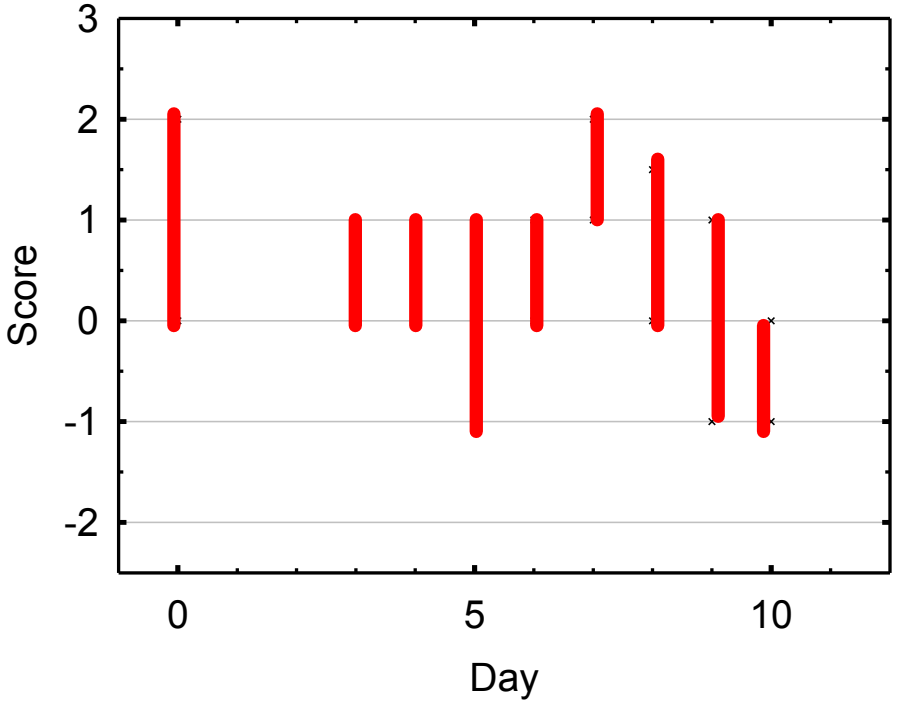
Swim synchronicity in sea pen (May)



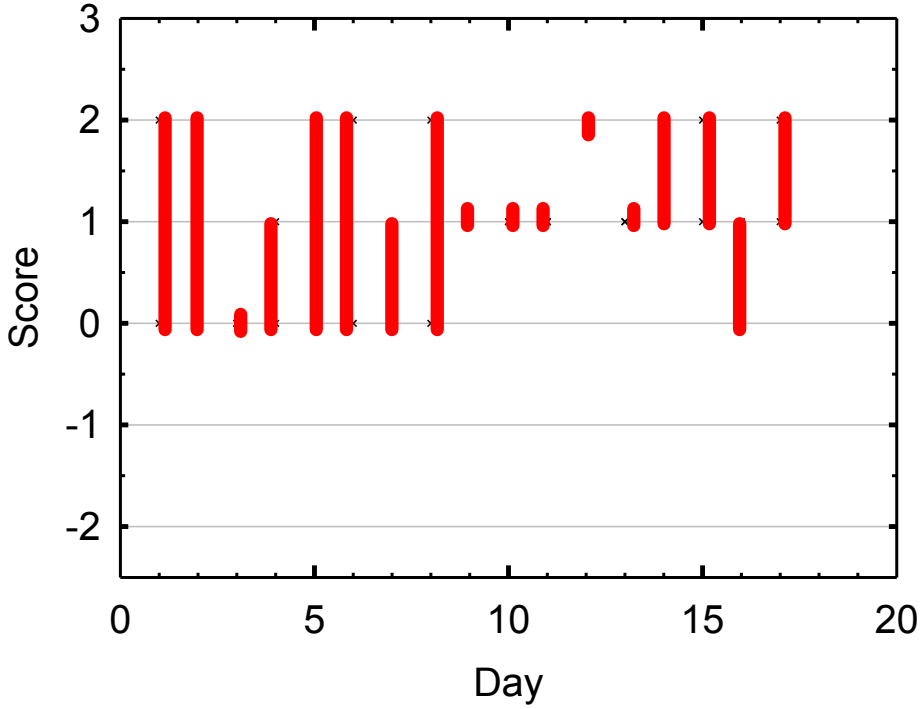
In wild: 0~60% (pair)

Reaction to human (May)

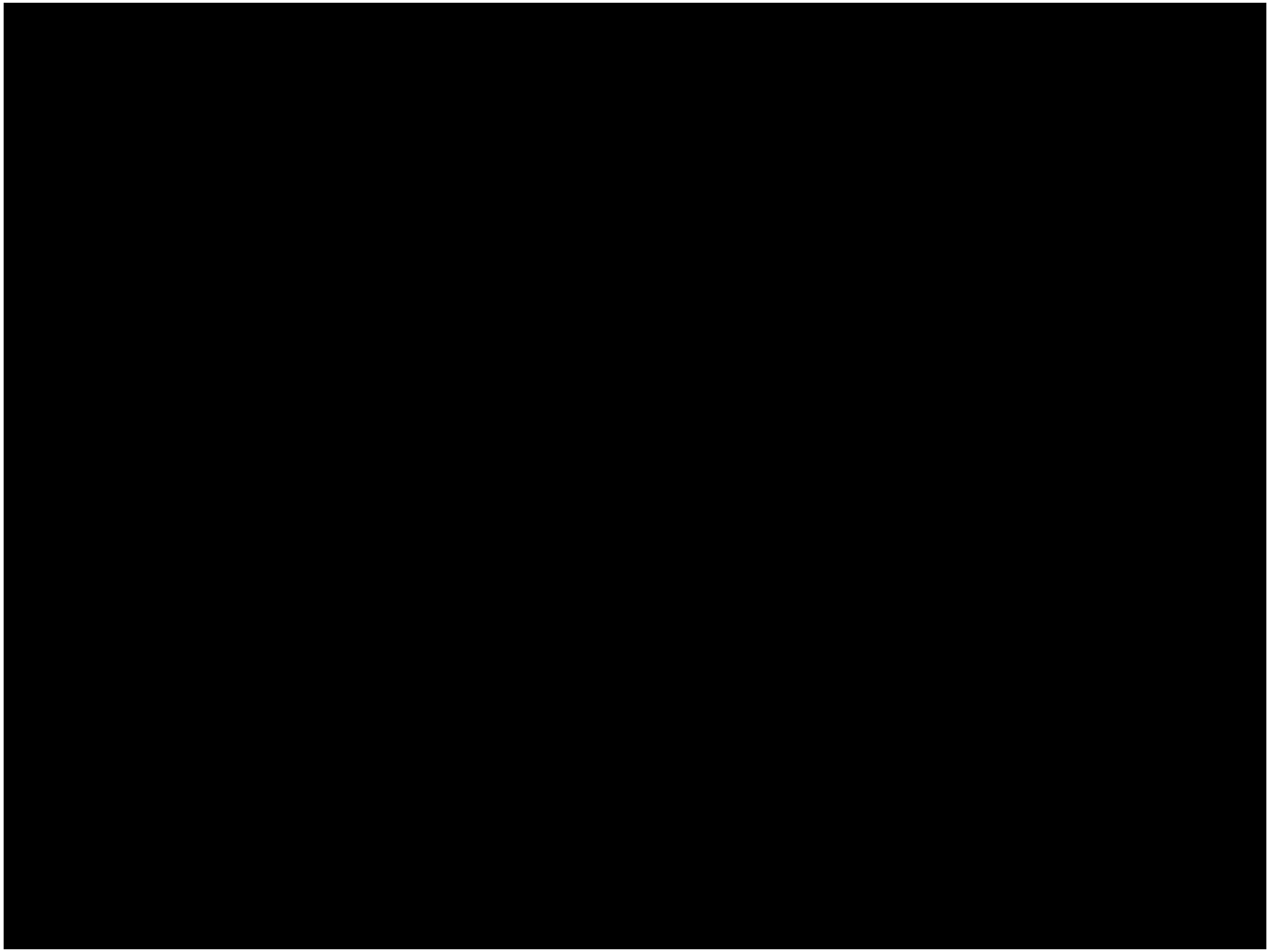
- April, Chunsam and Sampal



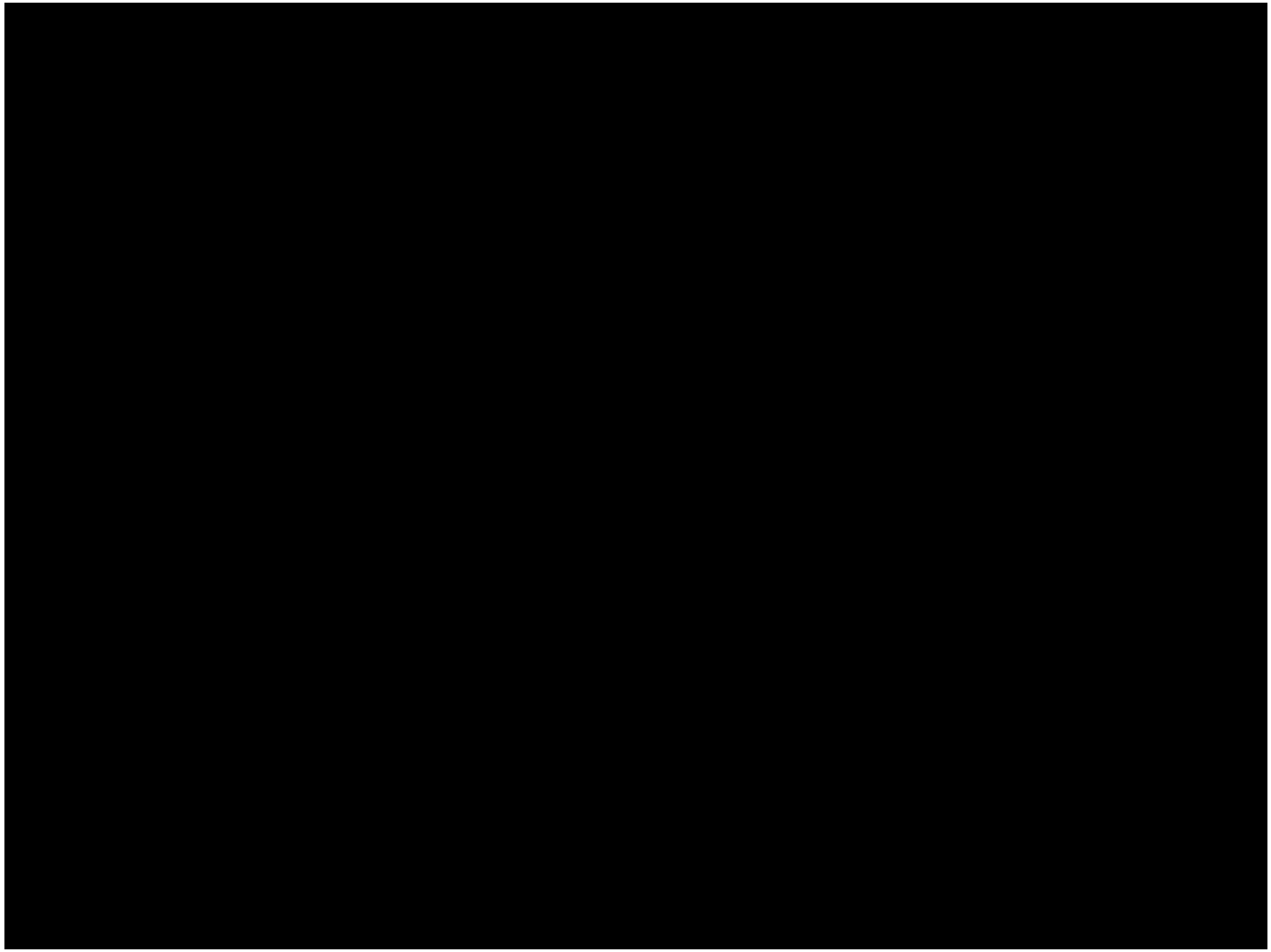
- May, After Jedol comes



Video clip: Feeding

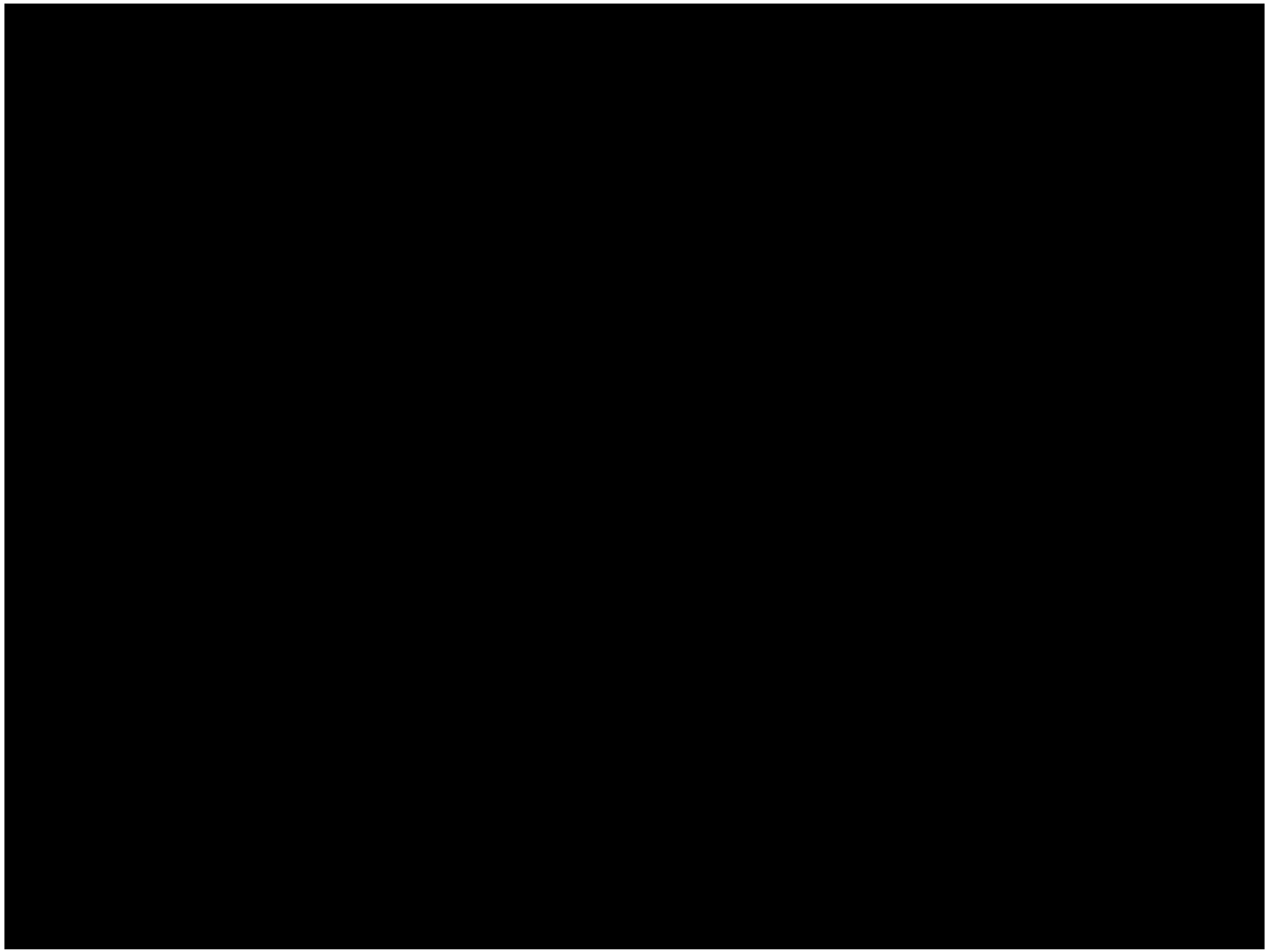


Video clip: Feeding



Play behaviors

Video clip: Play with polka dot boxfish



Video clip: Breaching

Conclusion

- Breathing and diving in the sea pen:
  - are approaching to those of the wild populations

⟹ Positive

- Surface rest in Jedol:
  - Sometimes out of the natural range

⟹ Need for continuous monitoring

- Prey chasing:
  - Jedol Is slower than Sampal and Chunsam in speed , change of direction, and stamina

⟹ Need for continuous monitoring

- Reaction to human:
  - Generally getting close to human

⟹ Need for consideration of feeding method

Research plans before release

- Behavioral research
  - will continue until the release
- Acoustic recording and monitoring
  - Purpose: To associate behaviors with acoustic signals
    To detect the establishment of local wild populations using acoustic signals
  - Method: Acoustic signals have been collected for 10 min per hour between 8:30 and 16:00
    Acoustic signals will be recorded for 24 h a day using an acoustic buoy

Thank you!

PROTOCOL FOR THE REHABILITATION AND RELEASE OF CAPTIVE ATLANTIC BOTTLENOSE DOLPHINS (Tursiops truncatus)

By Richard O'Barry, Marine Mammal Specialist, Earth Island Institute.

There are general criteria for the rehabilitation and release of captive dolphins back into the wild. But not a complete guide or cookbook. That's impossible because each captive dolphin is unique, requiring its own cookbook.

Dolphins react differently to captivity. Some have experienced more abuse than others. I have worked with dolphins who, when reunited with the sea, very quickly remembered who and what they were before their capture. Others needed more help, more time. So the most important part of my job is patience. I must simply sit back and observe the dolphins with a clear and open mind, allowing them to show me how best to help them regain their identity as opportunistic foragers, wild and free.

When every captive dolphin is different from every other one in a thousand different ways, returning one to the wild, his or her natural habitat, is therefore more art than science.

OVERVIEW

Over the past twenty-eight years, I have been involved in the rehabilitation and release of more than two dozen dolphins.

This is not to say that all captive dolphins can or should be returned to their natural homes. But all captive dolphins may be re-adapted to a more natural environment, to a natural sea lagoon, for example. This would provide the dolphin with the natural rhythms of the sea, the tides, the currents and exposure to live fish. All of this is therapeutic and improves the dolphin's quality of life. Reuniting the dolphin with his natural sea environment is an essential part of the rehabilitation process, and at this point the dolphin may be a candidate for release depending on several factors

1. Health and physical condition

2. Use of sonar

3. Ability to catch live fish

4. Defensive skills against predators

Many captive dolphins born in what we call 'the wild' are candidates for release. But not all of them. Some dolphins have received too many human imprints and have forgotten or lost the skills needed to survive in what was once their home. Habitat dictates behavior. Captivity has destroyed something vital in their lives, something that, were they human, we would call 'spirit.' For them, it is too late.

Some years ago, for instance, I had occasion to study a dolphin in Nassau, Bahamas, who had been in captivity for a long time and was now quite mad. They called him 'Big Boy' and he spent much of his time

ramming his head against the wooden entrance to his sea pen. On one side of the wooden gate was the area where he was protected, admired and watched with fascination, sometimes by hundreds of people. He was fed all he wanted to eat and was clearly master of his world. On the other side was the sea, his natural home. And as I watched him banging his head against the gate one day, I wondered if it would be possible to re-adapt him to the wild again.

What would happen if we simply let him go?
In the old days at the Miami Seaquarium when we no longer needed a particular dolphin, we put him in a sling, carried him out to the seawall and simply dumped him into Biscayne Bay. In the captivity industry this is called a 'Dump and Run.' This happened to Pedro, for instance, a huge male dolphin who became too hard to handle. How he fared in the waters off Miami, nobody knows.

But Big Boy was quite another problem dolphin. Captivity had turned him into a mental cripple. If we could re-adapt him, I thought, we could re-adapt any dolphin. But the longer I watched, the more I realized that we were too late. He'd had too much of it. I don't mean mistreatment. I never saw anybody deliberately mistreat Big Boy. In fact, I saw the reverse of that. What I saw was an excess of 'love.' Everybody wanted to be with him, to touch him and talk to him; in short, everybody wanted to 'help' this big old dolphin. But nobody knew how. And so, day after day, always smiling but full of rage, the big dolphin banged his head as if to get free again; a stressed out dolphin who was so uncooperative, unpredictable, suspicious and dangerous, a dolphin filled with so much hate that I knew I could never reach him.

What caused this to happen? Human intervention and stress. This always plays a leading part in the death of captive dolphins. Stress is a result of not enough space, too many people and having to play the fool too long. It is also the result of having to live in an artificial world, a world without tides, without the tastes and sounds of the ocean, and without anything that normally makes life worth living. When we try to turn dolphins into pets or 'companion animals,' it never works. This is hard to realize when it's happening. The dolphin seems to want to be a pet. He's always smiling -- seems to be laughing. He seeks us out to be petted and played with. All of this just like a real pet. But this is an illusion. Dolphins are forever wild, created by nature to play a role in nature, not to play silly games in a tiny pool for our amusement.

Apparent exceptions to this are dolphins born in captivity. There is no 'returning' them to their natural habitat. They have none. A few of these so-called 'battery dolphins' have been 'trained' to act like wild ones and they've been released into the sea. But until this procedure has been carefully monitored over time, we should consider each case on its own merits.

KNOWING DOLPHINS IN NATURE

The key to rehabilitating and returning captive dolphins to the wild is to know what a dolphin is like in his natural habitat. If you know that, then you can recognize the dolphin's learned behavior in captivity.

What are some of these? Watch a dolphin show for five minutes and you'll see virtually all of it. When the trainer comes out with a bucket of

dead fish, the dolphin gets exited and swims in circles. He leaps out of the water with excitement, comes down and lies on his back, paddling around with his flukes and flapping his pectoral fins as if clapping. When the trainer squats down to get a fish, the dolphin swims up and begs for food, making squeaky sounds and bobbing his head up and down, showing no fear even if there are hundreds of people watching.

All of this behavior is learned. The wild dolphin never does these things in nature because they would be irrelevant and without purpose. Now, though, when we are re-adapting the captive dolphin, these learned behaviors are quite significant. Indeed, we should make note of them because in preparing the dolphin to live once more in his natural environment, we can keep track as we extinguish these behaviors one by one.

EXTINGUISHING BEHAVIOR

When we talk about 'extinguishing' behaviors learned in captivity, it sounds like we're throwing water on a fire. Actually we're simply no longer paying the dolphin to do them. He learned to do these behaviors in the first place because we paid him to do them. When the dolphin swims up to the feeding station, sticks his head up and bobs it up and down while making a squeaking noise, we paid him to do each of those behaviors by tossing him a fish. That's how you reinforce behavior in a dolphin. So now, if we want to stop that behavior, we stop paying him. And very soon he stops doing it. Because we no longer pay him, it is irrelevant behavior, irrelevant both here and in the world we want him to live in. Again, habitat dictates behavior. At the same time, behavior that has survival value in the wild is reinforced and the dolphin, over time, is ready to return to his natural habitat.

When I put a Team together to help me rehabilitate a dolphin, I tell them that our basic job is to 'empower' the dolphin. When the dolphin is captured, I tell them, he loses his power. He is like a prisoner. And now it is for us to return his power to him. I tell the Team that in restoring the dolphin to his rightful place there are three things they should keep in mind

1. * Assume that you know nothing

2. Maintain sustained observation

3. Consider the obvious

These are subtle and very difficult instructions to follow, especially the first one and especially for dolphin trainers. Before trainers can step into the arena, they must strip away their own learned behavior. This is difficult for them because their whole experience with dolphins has been putting on a show, and now this, to them, is the 're-adaptation show.' They want to be part of the act, and at times it seems as if they expect applause. This is just the reverse of how we prepare a dolphin for living in his natural world. We are not putting on a show. We're putting on a non-show, and the less we do the better.

There is no shortcut to the sustained observation phase. This is not research; this is a technique. One must eat with the dolphins, sleep with them, and be with them constantly. We call this 'dolphin time.' How do

you learn it? Not merely by reading about it. You have to experience it.

Like anything else, whether science or art, you learn how to do it from someone who already knows. Then you know when you are in tune with them. You can feel it. If they gain ten pounds or lose ten pounds, you know it. We need to see exactly what is happening with the dolphins, not what we say is happening. This is not easy for most people.

Like an exercise in Zen, it's non-verbal. We lose ourselves and become one with the dolphin. When I'm doing it, I live in a tent next to the dolphins and I can feel myself become part of the scenery, like one of the trees, a leaf floating on the water, or a heron that simply comes and goes. When I don't respond to the dolphins' learned behavior, eventually they give it up. And everything I do is without words. I have to make reports, of course; that and the few directions I sometimes give are the only exceptions. But living with the dolphins on the silent level gives you an insight into dolphins that I think is necessary to understanding them and helping them become who and what they are. We think we already know who these dolphins are, for example, because we have their names, we know where they came from, what they eat and how much they weigh. But none of this tells us who they really are. In order to know them on that level, we must go beyond words. Beyond descriptions.

All of this is to eliminate false words and false theories about what we are doing. When we strip away our previous thinking, throw out our theories and substitute them with what we know for sure from our sustained observation, we can begin to see the dolphins as they really are and can better assess their survivability back in nature.

Before anything can be done, the entire Release System must be in place. The Release System is in three parts1) The Right People,
2) The Re-adaptation and Release Process, and 3) Post-Release Tracking.

THE RIGHT PEOPLE

The Director of Rehabilitation and Release, a recognized authority, knows dolphins both in captivity and in their natural habitat. He or she needs to be an authority because much of the job is dealing with local and federal authorities and the public through the media. He or she must also have hands-on experience in marine mammal husbandry, the care, feeding and transporting of captive dolphins.

The Project Manager manages the Staff and daily affairs, which include record keeping and documentation of the project as well as dealing with the required permitting processes. He or she also identifies an appropriate release site and organizes the population study of the resident dolphins near the site.

Helpers and Volunteers will be hands-on in the population studies and the post-release tracking of the dolphins. They are responsible for gathering suitable live fish for the dolphins.

The Veterinarian of Record, a qualified marine mammal veterinarian, should assess the health and fitness of the dolphins, be present during the transport, and available in case of emergency.

REHAB & RELEASE

Is it necessary to return dolphins to the very place they were captured? It is often desirable, but not always necessary. For example If a male dolphin is captured at a very young age and removed from his family pod, he cannot be expected to rejoin this pod several years later. Even if he had not been captured, he most likely would not remain with his original pod, because male dolphins at maturity normally join a new pod or form their own pod, sometimes a bachelor pod, with groups of females and their offspring, or both males and females traveling together. We also sometimes find singular dolphins who have either chosen to be alone or were ostracized from their pod.

So it is a mistake to think that we must return dolphins to the very place they were first captured. In fact, if the water in which they were captured had become polluted or poisoned during their absence or if fish they normally ate were no longer plentiful, we would not want to return them there. A search of the literature indicates that there is no empirical scientific documentation to substantiate the claim that dolphins must be returned to exact spot of capture.

Dolphins are quite adaptable and can readily accommodate themselves to a new home range if it is similar to the site where they were captured, similar in terms of tides, currents, extremes of water temperature, food supply and potential predators.

Our team will arrange for capturing enough local live fish for the dolphins to practice catching and eating. Water quality tests of the region have also been conducted and are available.

FEEDING

One of the most important functions in rehabilitating captive dolphins is to maintain a proper feeding regimen. The main objective is for them to maintain proper body weight by foraging and eating only live fish. This is a gradual process that may be viewed in four phases

1. Encouraging the dolphins to eat with their heads underwater.

2. Eliminating interaction with the feeder by varying feeding times and locations.

3. Dolphins eating only live fish.

4. And once again becoming opportunistic foragers.

In Phase 1, all activities are done from a regular feeding station, both live and dead fish to be offered only when the dolphins' heads are underwater. We continue feeding them dead fish but include live ones just to acquaint them, tossing the fish randomly at short distances, gradually increasing the distance and discouraging the dolphins from feeding with their heads out of water.

In Phase 2, we gradually wean the dolphins from their usual feeding regimen by tossing both dead and live fish from different locations and at different times. By now we are behind a blind to keep the dolphins from seeing us. We don't want them to associate feeding with the feeder.

We always toss live fish toward the center of the pen so the dolphins have a better chance to catch the fish before it escapes through the fence.

Sometimes it is necessary, initially, to immerse the fish in ice water to slow them down, giving the dolphins a better chance of a successful chase.

Feeding becomes more random and uncertain. We now toss dead and live fish from behind a blind at all hours, including early morning and after dark. In the water we have a hydrophone so that we can monitor the dolphins' use of sonar in finding fish, especially live fish. We can compare audio recordings of confirmed catches during the day with night feedings.

We increase the number of feeding sessions, decreasing the quantity of fish per session. Short, quick feeding sessions from varied locations and at all hours will discourage the dolphins from searching for the feeder.

In Phase 3 (eating only live fish) we must first make sure we can provide enough live fish for the dolphins. We need a good source of fish indigenous to the release site. We analyze these for nutritional value and, in figuring the dolphins' total diet, allow for the energy used in chasing live fish.

While continuing to feed the dolphins at various times and from various places, we now increase the proportion of live fish. When the dolphins are eating mostly live fish, we introduce them in groups of 10 or 15, creating a 'school' of fish, which adds realism and forces the dolphins to select the prey they will chase down.

Finally, in Phase 4, we eliminate the human element from feeding and encourage the dolphins to forage on their own. We constantly introduce live fish into the pen and keep track of the dolphins' rate of consumption, finally replacing dead fish in their diet with live indigenous fish such as mullet. When the dolphins are ready to venture out of the pen, they make it very clear to those who can read their body language.

POST-RELEASE TRACKING

The dolphins will have been freeze-branded during the re-adaptation stage to aid in visual identification. Radio-tracking devices have been determined to be invasive and provide sites for future infection. Radio telemetry devices have not proved to be reliable in the past.

When you release a dolphin, you want everything to be as natural as possible. All along we're setting up a tracking team made up of people who live on the water, fishermen and boat operators. We talk to them in person. We tell them what we're doing at every stage, especially about the freeze-brand we'll put on the dorsal fin. The fishermen and boat operators are not part of the dolphin's captive world, they're part of the sea. If you tell the fishermen what's going on, they become part of it. It's not like they're joining something. They're already part of it. They know the dolphins they see every day like they know their own children. Later when we finally release the captive dolphin, when they spot him swimming, they report it to us and we record it, we record who spotted

the dolphin, where and when, what direction he was going and with what or how many companions. Most especially we're interested in any unusual behavior.

If the dolphin is begging for food, for example, that doesn't mean failure. That means we have to keep people away. When the dolphin is first released, this is a very crucial time. He goes through a period of adjustment. He might even miss a meal. Up till now we've been feeding him regularly, all he wants. He's fat and sassy. Now he's having to feed himself. That's the main adjustment for the dolphin. And we must get out of his way and let it happen.

That's the whole point of rehabilitation and release, to let this crucial moment happen. At first we get reports of his whereabouts every day. Sometimes several reports. We put it on a chart, trace his movements. He's here on the chart one day, there another. We see patterns. That means the dolphin is developing a life of his own. And after a while -- if we let him alone -- he'll establish a new home range, a natural life in the wild again.

*** Assume you know nothing simply means that one should not assume that the candidate dolphin can or can not be successfully released back into the wild. In other words, keep an open mind.**