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ABSTRACT

A male white whale caught in 2012 lived in artificial environment for six years and was released in Sakhalin Bay in August 2018 with a satellite tag attached. Moving along the west coast of Sakhalin, at a variable speed, reached its southern part in a month, passed the La Perouse Strait and spent some time in the waters of the northern part of the Hokkaido. Then he left Japan waters and, moving in the Sea of Japan far from the coast, reached the waters of South Korea. Having examined the coast, the male began to return to the shores of Russia, when the signal from his radio beacon disappeared. The tracked route of the male white whale is undoubtedly of scientific interest. Studying the migration route of the white whale, we can confidently state that it regained the skills of independent foraging, but, most likely, it moved alone and its route is not typical for the migration of wild white whales.

KEY WORDS: SATELLITE TAG, WHITE WHALE, READAPTATION, MIGRATION

INTRODUCTION

Keeping animals in captivity serves two purposes - entertainment and research and includes multitude of complex problems, the solution of which is aimed primarily at improving the well-being of an individual in an artificial habitat. This problem is much more complicated for cetaceans due to their aquatic lifestyle. As a rule, in captivity, some features of the biology of cetaceans are studied, which cannot be performed in the natural habitat of the species.

However, when keeping an animal in artificial conditions for a long time, problems arise with providing cages and pools that are favorable in terms of area and volume, and behavioral deviations after puberty, when they become excitable and uncontrollable. In this regard, the most widely known story is the release of the killer whale Keiko into the wild (Berman, 2000, 2002a, 2002b, 2003), which ended poorly.

In 2018, after the completion of scientific research programs, it was decided to return the male white whale to its natural habitat and track its movements after release, which is of undoubted scientific interest. In addition, despite an increase in the number of rehabilitated and released marine mammals, their survival in the wild is poorly documented.

The best way to monitor a released animal is by satellite tracking. Recently, satellite tagging of marine mammals has been widely used to study various aspects of their biology (Shpak et al. 2010; Шпак и др. 2008; Литовка 2004; Nawojchik et al., 2003; Шпак и др., 2012) migration routes and seasonal movements, determination of breeding or feeding areas, frequency and depth of diving, etc.

The purpose of this study is to describe and analyze the migration path and behavioral features of a released male white whale. Partially, the materials of this work are presented in the abstracts at the international conference «Marine Mammals of the Holarctic» (Гущеров и др., 2021).

MATERIALS AND METHODS

For six years, a male white whale named Gary has been involved in research on various aspects of cetacean biology, conducted at the TINRO base in Srednyaya Bay (Primorsky Territory; Vostok Bay, Sea of Japan). Upon completion

of the implementation of the Scientific Research Programs, it was decided to return the white whale to its natural habitat in the area of its capture. In Srednyaya Bay, a male white whale was kept in a floating enclosure with a natural water area 5-7 m deep, fenced off from the sea by net walls. During all the years of detention, he was in the community of other white whale's. It was transported to the release area (Sakhalin Bay) in a sea water bath installed on board the ship. White whale transportation from Srednyaya Bay to Sakhalin Bay took 4-4 days. Upon arrival at the release site, a radio beacon was placed on the animal and it was released. On the day of release, Gary's length was 4.5 m, weight - 1200 kg, and age about 8 years. The animal was healthy and well-fed.

The radio beacon (satellite tag) installed on the white whale was produced by the Russian company ES-PAS LLC and is a waterproof device, 9x6x4 cm in size, equipped with a small antenna and six flexible cables for fastening.

After attaching a satellite tag to the white whale, the release was carried out as follows (Figure 1). The animal with the installed radio beacon was fixed in a stretcher and lifted out of the bath with a winch. The stretcher was then moved overboard, lowered to sea level, and the cables on one side of the stretcher were cut. White whale freely moved into the water from the opened stretcher, dived and disappeared. An attempt was immediately made to feed the released white whale. For this, defrosted herring (usual food) was scattered from the ship, but the animal was not visually detected.

The satellite tag was processed by the Argos system and had a unique identification number. Sometimes the system failed, and data transmission was not carried out within 1-6 days, and some points of the location of the animal were erroneously indicated on the shore.

RESULTS

On August 10, at about 4 p.m., a male white whale named Gary was returned to its natural habitat near Cape Tamlavo (Sakhalin Island). All recorded movement of the white whale from August 10 to November 09 is shown in Figure 2.

An analysis of the tracks of the specimen from August 10 to 11 shows (Figure 3) that, most likely, Gary tried to join the groups of white whales feeding in the Zotov Bank area, and was restoring hunting skills in natural conditions, since during these days he was in familiar shallow waters, at depths of 1-5 m. Baidukov and Fr. Sakhalin.

Later, from August 13-17, he explored the shallow part of the Amur Estuary, moving at a variable speed of 0.35-5.0 km/h, visited both coasts (mainland and Sakhalin Islands, Figure 4). It can be assumed that he either was part of a group of white whales, or tried to join one of the groups. On August 18, he returned to the shores of Sakhalin and, apparently, was feeding again all day on August 19. Then, on August 20-21, Gary left the coast of Sakhalin and went to the area near the village of Lazorevsky on the mainland side of the Nevelskoy Strait. It is known, that during the spawning period, salmon fish, before entering fresh water, concentrate near the mouth of the rivers. Therefore, most likely, on the morning of August 21, 2018, the white whale was feeding at the mouth of the river near Cape Kamenny, and then crossed the Nevelskoy Strait and again entered the shallow water of the Sakhalin coast near Cape Lakh. Here, the animal stayed in Tyk Bay until August 22, 2018. During August 22–23, the male slowly moved south at a speed of 0.5–5.0 km/h, stopping twice for feeding. Having entered on the evening of August 23 at the mouth of the Viakhtu River, he probably fed. Apparently, the hunt was successful, because on August 23-25, Gary swam at a speed of 2-3 km / h along the coast, moving to the south.

From August 26 to September 4 (Figure 5), the white whale, due to a sharp deterioration in weather conditions, may have taken refuge from the storm in Kazakevich Bay.

On September 5, he continued to move south (Figure 6). Unusual in his behavior is that he lingers for some time in the area of coastal settlements (Shakhtersk, Porechye, Orlovo, Krasnogorsk, etc.). Also on September 11, Gary lingered in the area of the city of Kholmsk, the village of Yablochnoye, meanwhile the speed of his transitions between these settlements was low 2-4 km / h. Perhaps he was trying to attract people's attention to himself, or he was looking for a familiar place where he was kept for 6 years. On September 13, after passing through Nevelsk, Gary reached the coast between the settlements of Gornozavodsk and Shebunino. Here, its speed increases dramatically (up to 20 km / h, which is most likely a technical error) and it heads towards Moneron island, but not

reaching it, returns to the coast of Sakhalin. On September 15, he reaches Cape Crillon, the southernmost point of Sakhalin.

During daylight hours, Gary crosses the La Perouse Strait and approaches the coast of Hokkaido (Figure 7), where he stayed for the whole day on September 16 near the Higashiura Fishing Port (Sarufutsu, Sōya-gun, Hokkaido). On September 17-21, he moves south, exploring the eastern coast of the Sea of Okhotsk in the north of about Hokkaido to the city of Nayoro, but on October 3 it returns again and enters Soya Bay, Wakkanai (at the same time, according to our information, specialists from the Laboratory of Marine Ecosystem Change Analysis Field Science Center for Northern Biosphere, Hokkaido University Hakodate Research Center for Fisheries and Oceans saw a white whale in the area with a tag installed). However, on October 06, it is again found before reaching the city of Nayoro, and by October 12 it is noted on the beam of Aniva Bay. It should also be noted that from October 13 to October 16 there was no satellite tag signal (possibly due to stormy weather conditions).

Again, the beacon signal is recorded on October 17 far out to sea (Figure 2) abeam the village of Olga (Primorsky Territory), the male white whale moves south, and on October 27 it reaches the water area off the coast of South Korea (Figure 8). Examining the shores, the male moves close to the coastline to the south and reaches the port in Uljin on November 02, and then moves away 30-50 km more seaward, apparently attracted by the lights of fishing boats. Thus, the white whale reached the southernmost point of its movement.

On November 6, it reaches a small port in Samcheok, where it does not stay long. November 7 leaves Samcheok, and moves along the coast in a northerly direction. The last signal from its radio beacon is observed on November 9 at 38.08° N; 129.46° E.

Thus, the duration of satellite tracking of the migration of this specimen was 91 days.

INTERPRETATION

White whale in the Sea of Okhotsk was a commercial object for decades of the last century and therefore was studied in sufficient detail at that time (Клейненберг и др. 1964). Analysis of aerial survey data for 1979-1990 made it possible to identify three populations of white whale's in the Sea of Okhotsk (Берзин и др., 1986, 1990). The Sakhalin-Amur population inhabits the Sakhalin Bay and the Amur Estuary, the number of which is estimated at 10 thousand individuals. In the western part of the Sea of Okhotsk, in the area of the Shantar Islands and the Uda Bay, in the summer, the Shantar white whale population estimated about 5 thousand individuals. The North Okhotsk population of white whales inhabits the northern part of the sea, the Gizhiginskaya and Penzhinskaya bays, the number of which is determined at 10 thousand individuals (Берзин и др., 1986, 1990).

White whale Gary was caught in the Sakhalin Bay of the Sea of Okhotsk and, therefore, belongs to the Sakhalin-Amur population. The behavior of these white whales in natural conditions is well known and is characterized by extreme fearfulness, the desire to avoid contact with people. In summer, during the spawning of salmon fish, white whales form large concentrations near the Zotov Bank (north of Sakhalin Island) and in the estuary of the Amur river not moving to the lower latitudes of the Tatar Strait (Клейненберг и др., 1964). In winter, as established by the results of satellite tracking (Shpak et al., 2010, Шпак и др., 2012), white whales are found in floating, rarefied ice north of the Iona island (Sea of Okhotsk).

An analysis of Gary's travel pattern shows that most of the time he moved in sight of the coastline, at shallow depths, which is not typical for the migrations of the Sakhalin-Amur population (Шпак и др., 2008). Gary clearly avoids great depths. This is probably due to the fact that he spent most of his life in a cage, the depth of which was 5-6 m. Judging by the tracks of the first days, he tried to join any of the groups of wild white whales, but obviously unsuccessfully.

Based on data on movement speed and long delays near river mouths, we believe Gary has successfully regained his feeding and self-hunting skills.

An unusual feature of Gary's behavior during migration is long delays near coastal settlements. For the first time, this feature manifested itself in the form of delays near the coastal villages of Sakhalin Island. It manifested itself especially brightly in the form of a very long stay near the Japanese city of Wakkanai and the local Higashiura Fishing Port (Sarufutsu, Sōya-gun, Hokkaido). Probably, from the water level, the view of the buildings on the shore of the port is similar to the view of the buildings of the village of Srednyaya, in the cages near which the animal lived most of its time. Another possible reason for the delay in Wakkanai may be that there is a local public aquarium where spotted seals are kept. And it can be assumed that the locals tried to feed him, which explains his long stay at the piers of the city.

There are known cases of observation of wild white whale's off the coast of Hokkaido (Sato and Ichimura, 2011) and northern Primorsky Krai (Волошина, Матюшкин, 2006). However, Gary's desire to move south is inexplicable, if we do not allow the assumption that the white whale continues to look for its "home", the place where he lived most of his time. The unexpected appearance off the coast of the Korean Peninsula is most likely due to the fact that the animal took advantage of the cold Primorsky Current, which carried it past Vostok Bay, in which Srednyaya Bay is located, to the coast of Korea. Probably, heavy shipping and warm water in the south of the Korean Peninsula deterred Gary away and he began to move back north.

On November 9, the signal from his radio beacon disappears completely. It is possible to put forward different versions of the reason for the loss of the tag signal, but it is not possible to reliably determine this. One of these reasons may be the depletion of the battery of the satellite tag or its loss. One of the design features of the satellite tag is steel cables, which are intensively corroded in sea water, as a result of which the device falls off and sinks. An example of such a successful disposal of the radio beacon is clearly visible in the photo of another white whale (Figure 9). The photo clearly shows 6 points, places of healed punctures.

CONCLUSION

In recent years, the release of animals that have lived for some time in captivity is perceived by the public positively, but there is also a negative side. For example, the possible risk of infection of wild populations with pathogenic bacteria and viruses from released animals (Quakenbush, Beckmen, Brower 2009). As the data of this study showed, there is an ignored risk of low social adaptation of an individual. As can be seen from Gary's movements, he did not join wild white whales and migrated south: to the shores of Japan and Korea, where white whales have never been observed. This fact shows that the decision to release animals that have lived in artificial conditions for a long time must be balanced. It is important to take into account various risks and be guided, first of all, by the well-being of the individual.

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Figure 1. Stages of release of a white whale from a vessel

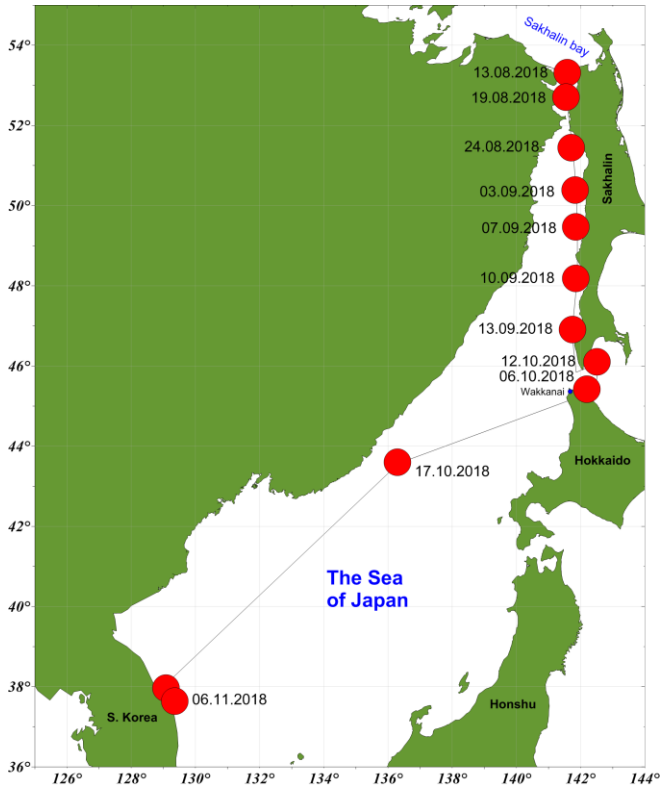

Figure 2. Map-scheme of the white whale path (10 August – 09 November 2022)

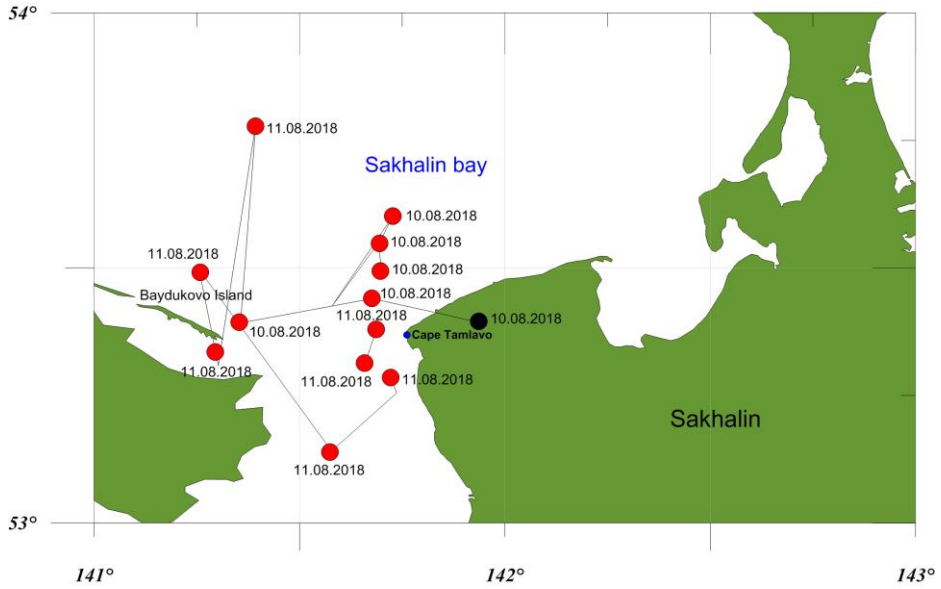

Figure 3. Map-scheme of the white whale path (10-11 August). The red circle indicates the location of the animal, the black circle indicates the location error

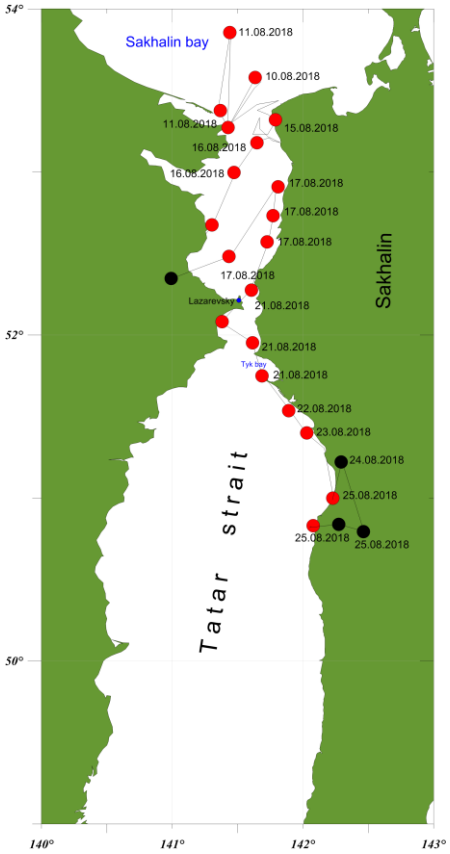

Figure 4. Map-scheme of the white whale path (11-25 August). The red circle indicates the location of the animal, the black circle indicates the location error

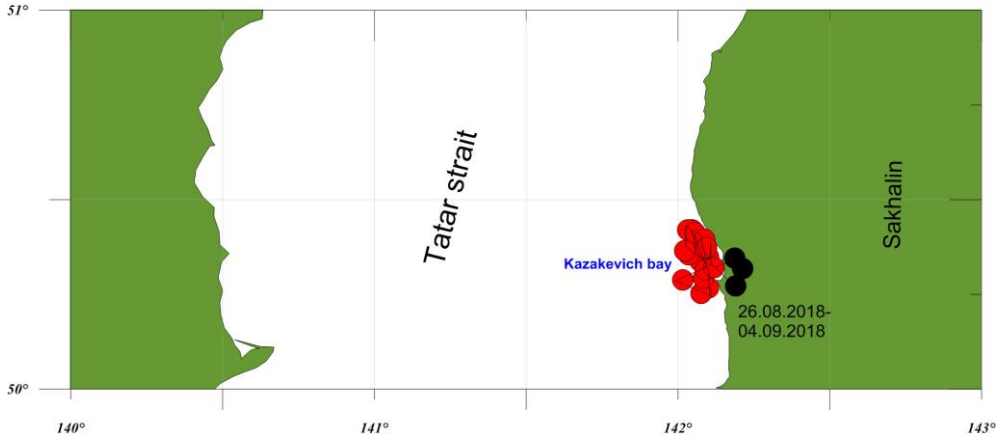

Figure 5. Map-scheme of the white whale path (26 August – 04 September). The red circle indicates the location of the animal, the black circle indicates the location error

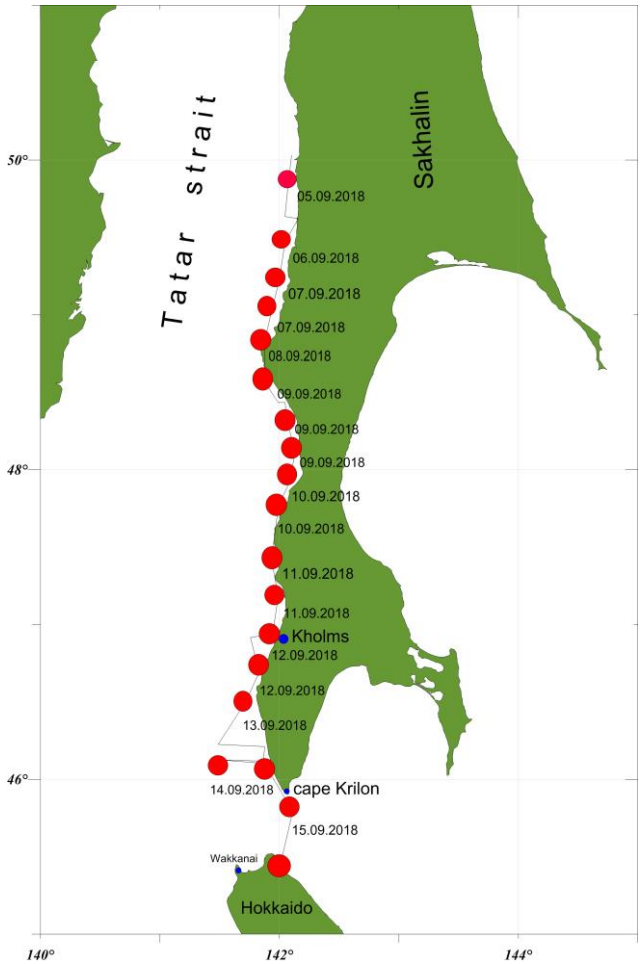

Figure 6. Map-scheme of the white whale path (05-15 September). The red circle indicates the location of the animal

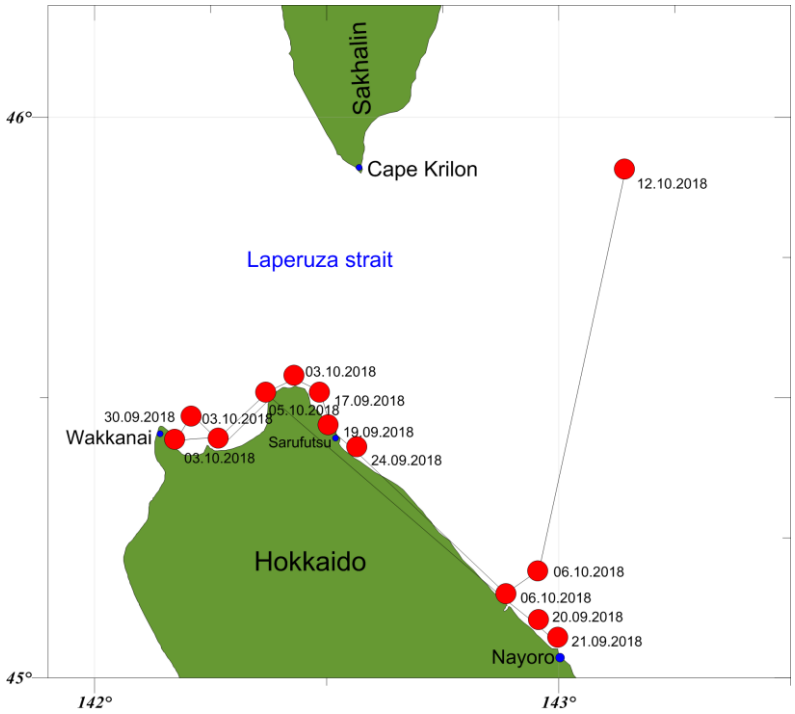

Figure 7. Map-scheme of the white whale path (17 September – 12 October). The red circle indicates the location of the animal

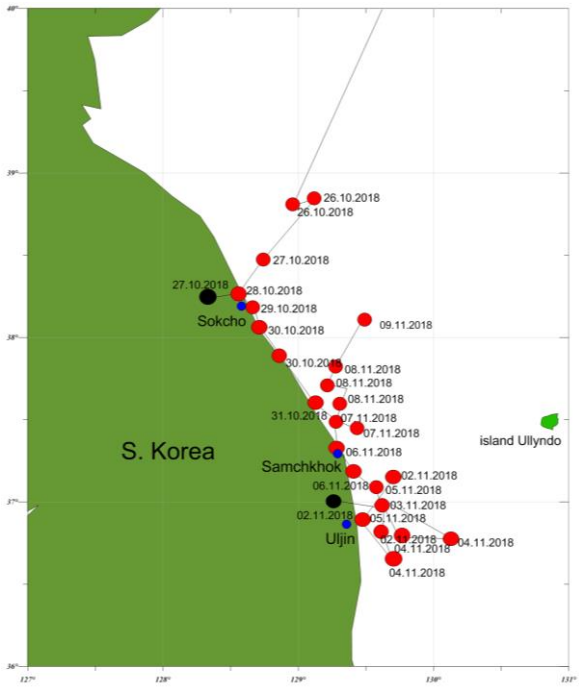

Figure 8. Map-scheme of the white whale path (17 October – 09 November). The red circle indicates the location of the animal, the black circle indicates the location error

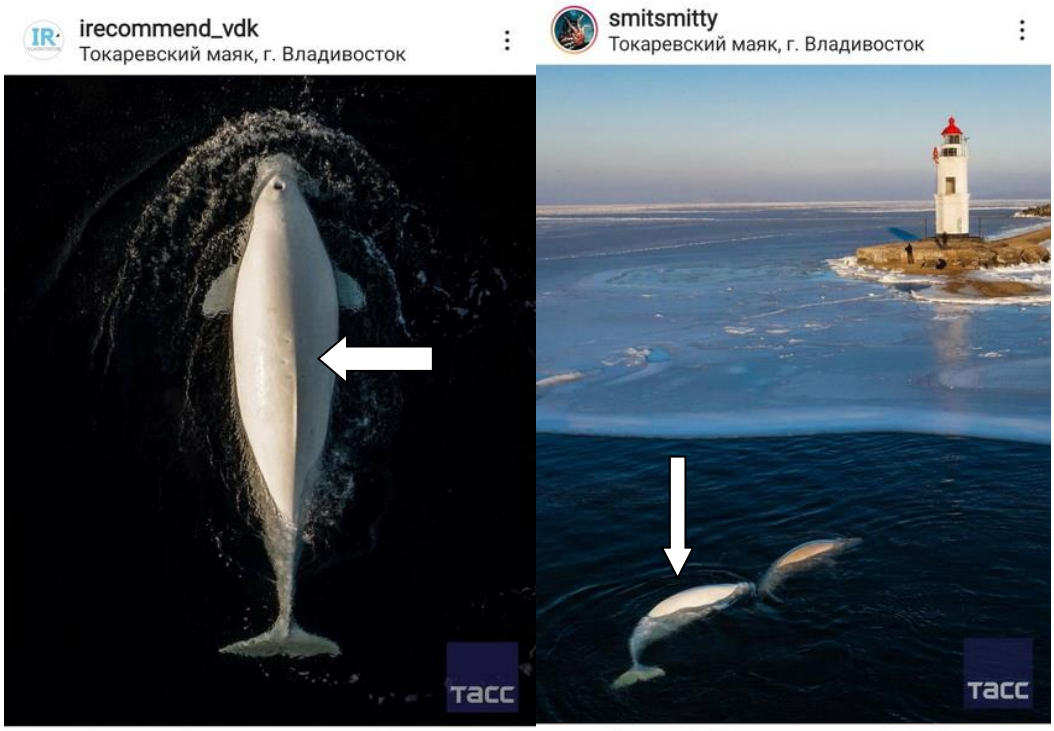

Figure 9. White whale after the loss of the radio beacon. Arrows indicate healed subcutaneous fat puncture sites (photo for instagram: irecommend_vdk and @smitsmitty)