



## NAMMCO ANNUAL MEETING 31

*19-21 March 2024*

*Hotel Reykjavík Grand, Reykjavík, Iceland*

## MEETING OF THE COUNCIL

<b>DOCUMENT 15rev</b>	<b>UPDATE ON THE MINTAG PROJECT: MARCH 2023-MARCH 2024</b>
<b>Submitted by</b>	Secretariat // MINTAG Steering Group
<b>Action requested</b>	To take note To Secure that partners funding is in place to have the appropriate platforms for tagging in the summer of 2024
<b>Background/content</b>	<p>NAMMCO member countries and Japan agreed in July 2021 to cooperate on a scientific project aiming at developing new satellite tags to be used on fast swimming rorquals and pilot whales.</p> <p>The project was officially launched on 4 August 2021 and developed since.</p> <p>This document provides the progress report for the period March 2023 to March 2024, as well as an activity plan up to March 2025.</p> <p>In the summer of 2023, the MINTAG project conducted the deployments of the first experimental MINTAG versions on minke and fin whales in Greenland, Japan, and Norway. This document summarises the tests, tagging efforts and challenges encountered, and presents the plans for the upcoming tagging season, as well as the developed tag design.</p>

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## 1. Project background

The primary objective of the project MINTAG is to develop smaller and lighter satellite transmitter tagging systems than the ones existing on the market today, which are specifically designed for the study of fast-swimming baleen whales, including blue, fin, minke, sei, Bryde's, and pilot whales. Successful long-lasting tags have not yet been developed for these species, and there is limited knowledge about their wintering movements and migrations.

The project focuses on three target species: fin whales, minke whales, and long-finned pilot whales, with the development of a larger tag for fin whale and a smaller tag for minke and pilot whales. Once the MINTAG is successfully developed, it will also be used for species like Bryde's, sei, and blue whales.

The Project Partners involved in this initiative include the Faroe Islands, Greenland, Iceland, Japan, and Norway. The project is overseen by a Steering Group (StG), which reports to the NAMMCO Finance and Administration Committee (FAC). The project is led by Professor Heide-Jørgensen from Greenland, with five partner-nominated scientists on the StG who have expertise in whale satellite tagging. Additionally, the Fisheries Agency of Japan (FAJ) and the NAMMCO Secretariat (SEC) are also members of the Steering Group.

The composition of the StG in terms of persons changed somewhat in the second half of 2022 (changes in staff) and is now composed of the following persons:

- FO: B. Mikkelsen (FAMRI)
- GL: MP Heide Jørgensen (Project Leader) and R. Guldborg Hansen (GINR)
- JP: L. Pastene and K. Konishi (ICR)
- IS: S. Granquist and S.D. Halldórsson (MFRI)
- NO: C. Lydersen (NPI), N. Øien & M. Biuw (MRI)

## 2. Project development in the period March 2023 – March 2024

The overall project development until now, since the cooperation agreement between NAMMCO member countries and Japan was finalised on **1 July 2021**, is presented in **Appendix 1**.

Different tag and launcher features were tested by different partners (FO, JP, GL) in **January and February 2023**. In **March and June 2023** ballistics tests have been carried out by StG members and Wildlife Computer (WC), the tag Manufacturer (item 2.1). **A second** testing at the Icelandic Whaling Station to investigate the deployment performance of dummy tags using fin whale carcasses was conducted in Iceland in **September 2023**

The first deployment of the first MINTAG prototypes, version V0b, on live fin and minke whales took place in the summer of 2023, from **June to September 2023** in Japan, Greenland and Norway. The remaining tags were deployed in **October 2023** by external collaborators in northern Norway (item 2.2).

### 2.1 Schedule of Steering Group's meetings and activities

Table 1 below lists the activities of the MINTAG StG (meetings and field work) for the period March 2023-March 2024, and includes an activity plan up to March 2025. The complete list of the StG activities since the project launch in July 2021 can be found in Appendix 1.

Table 1. Summary of MINTAG Activities for the period March 2023-March 2024.

Month Year	Activity	Participants	Description
March 23	Ballistics tests	GL	Objective: to test the ballistics of the fin whale tag [28.03.23, DK]
March 23 – August 23	Tag development	WC	
June 23	Ballistics tests	GL / WC	Objective: to test the flight precision of the minke and fin whale tags during target shooting and to test the ballistics of a fin whale tag with only a 10 cm shaft. [28-29.06.23, DK]
June 23	Tag deployment	JP	Deployment of five fin whale tags on fin whales [05-15.06.23, southern Okhotsk Sea, JP] <ul style="list-style-type: none"> <li>▪ Lost after deployment: 0/5</li> <li>▪ Transmitted location: 2/5</li> </ul>
August 23	Tag deployment	GL	Deployment of five fin whale tags on fin whales [08-17.08.23, East Greenland, GL] <ul style="list-style-type: none"> <li>▪ Lost after deployment: 1/5</li> <li>▪ Transmitted location: 1/5</li> </ul>
August-September 23	Tag deployment	NO	Deployment of three minke whale tags (MWT) on minke whales and one fin whale tag (FWT) on a fin whale. [15.08-15.09.23, Svalbard, NO] <ul style="list-style-type: none"> <li>▪ Lost after deployment: 0/3 (MWT), 1/1 (FWT)</li> <li>▪ Transmitted location: 2/3 (MWT), 0/1 (FWT)</li> </ul>
August – September 23	Tag deployment	NO	Deployment of one minke tag on a fin whales [31.08-20.09.23, Barents Sea, NO] <ul style="list-style-type: none"> <li>▪ Lost after deployment: 0/1</li> <li>▪ Transmitted location: 1/1</li> </ul>
September 23	Deployment tests	StG (GL) / WC	Objective: to test the deployment of dummy tags on fin whales at the whaling station in Iceland. [7-12.09.23, Hvalfjörður, IS]
October 23	StG 7 meeting to discuss the deployments during the summer of 2023	StG / Sec	Each partner presented the field efforts and the StG discussed potential solutions to the encountered problems. [10.10.23, online]
October 23	Tag deployment	NO (External Group)	Deployment of eight tags (unused tags) on killer and humpback whales [16-21.10.23, Skjervøy, NO] <ul style="list-style-type: none"> <li>▪ Lost after deployment: 2/6 (MWT), 0/2 (FWT)</li> <li>▪ Transmitted location: 4/6 (MWT), 1/2 (FWT)</li> <li>▪ Remaining tags after field season: two broken FWT</li> </ul>
November 23	Summary of deployment in Skjervøy	StG / Sec / External Group	The external group, who deployed the remaining tags in Skjervøy, presented the performance of the field efforts. [28.11.23, online]
November 23	StG 8 meeting to be presented with the performance of the electronics of the tags	StG / WC / Sec	WC presented their experiments and results to test the tag performance. [28.11.23, online]
January 24	StG 9 meeting to decide on the new design and upcoming plans	StG / WC / Sec	The StG and WC met to decide upon the new tag design for the upcoming tagging season. [21-22.01.24, Hafnarfjörður, IS]
January 24 – March 24	Tag development	WC	

## 2.2 Project reporting since the project was launched

Besides the report of the Steering Group meetings, several reports have been finalised by the Secretariat and the StG. They are listed below:

- Annual MINTAG report to the NAMMCO Scientific Committee 28 (January 2022, Doc SC/28/21)
- Progress Report August 2021-June 2022, including Schedule of activities April 2022 – March 2023 (July 2022) communicated to FAJ
- MINTAG Report 1 – Test of dummy tags on fin whale carcasses in Iceland, 10-16 July 2022 (July 2022).
- Update on the MINTAG Project – Year 1 /August 2021-June 2022, also presented to Council 29 as document NAMMCO/29/14 (September 2022) and circulated to FAJ
- MINTAG Report – Tag design meeting in Copenhagen 25-26 October 2022, also presented to SC 29 (January 2023, Doc SC/29/17) and communicated to FAJ.
- Annual MINTAG report to the NAMMCO Scientific Committee 29 (January 2023, Doc SC/29/16)
- Progress Report March 2022 – March 2023, with activity plan up to March 2024, also presented Council 30 (Doc NAMMCO/30/15, March 2023) and communicated to the FAJ
- MINTAG Report 8 – Test of dummy tags on fin whale carcasses in Iceland, 7-12 September 2023 (September 2023).
- Annual MINTAG report to the NAMMCO Scientific Committee 30 (January 2024, SC730/)
- **Present Report:** Progress Report March 2023 – March 2024, with activity plan up to March 2025, both presented to Council 31 as document NAMMCO/31/15 (March 2024) and communicated to the FAJ.

## 3. Deployment of the v0b tags

### 3.1 Initial ballistics tests

Performance tests of the prototype MINTAGs were carried out in several locations, including the Faroe Islands, Japan, Denmark, and Iceland, throughout 2023. The following are key lessons learned from these tests:

- The retention cone approach designed for the 1st generation of MINTAGs was effective in anchoring the tag under the fascia when shooting at whale carcasses.
- The long version of the MINTAG, with a total length (TTL) of 29cm and two retention cones intended for use on fin whales, encountered challenges in being fully embedded under the skin.
- A modified fin whale tag with a shorter length (21 cm), featuring one retention cone and a broadhead tip, provided better performance in achieving full penetration when deployed on fin whale carcasses at the whaling station in Iceland.
- Suggested modifications for the fin whale tag include considering barbs instead of retention cones and using a longer spear for deployment.
- The carrier of the tags was simple and user-friendly, but the flights were found to be fragile and should be handled with care or possibly replaced with strings.
- The minke whale tag version demonstrated optimal ballistic performance out to a distance of 20 meters, was well embedded, and was difficult to pull backward.

- It was observed that the stopplate needs to be glued to the attachment cup, and further testing is required to determine if a larger stopplate is necessary to prevent the tag from embedding too deeply into the blubber.

### **3.2 Summary of summer 2023 experimental deployments**

The initial deployment of the 1st generation of prototype MINTAGs (V0 tags) faced various challenges in different regions, particularly for fin whales. A summary of the MINTAG tag deployments during the summer and autumn 2023 (Figure 1):

#### **Japan deployments on fin whales (V0a; TTL=29 cm):**

Five fin whale tags of the initial version with two retention cones and a long spear were deployed in Japan. All the tags had difficulties penetrating the skin as it could be observed on images and footage that the tags were only partially embedded. The poor ballistics also made it challenging to hit the target accurately. However, two of the five tags provided positions for 32 and 33 days, revealing extensive movements from the Okhotsk Sea into the Pacific Ocean (Figure 1). Three more tags were deployed but did not provide any locations.

#### **Modification for East Greenland fin whales (V0b; TTL=21 cm):**

Based on the lessons from Japan and carcass tests, the fin whale tag was modified. Changes included removing the front retention cone, using a shorter spear, and employing a broadhead tip.

Field work in East Greenland had to use a small dinghy with a low shooting angle instead of the planned larger vessel with a wheelhouse platform for shooting.

Deployment outcomes included the loss of one tag when the shot missed the whale, and the carrier lost the tag. Three tags yielded no positions, possibly due to deploying them too low or having them embedded too deeply.

One tag was successfully deployed and transmitted for 17 days, revealing the strong affinity of fin whales for the coastal shelf of East Greenland.

Despite the challenges and setbacks, the modifications made in the V0b model showed some improvements in the tagging of fin whales in East Greenland.

#### **Tagging of minke whales in Iceland:**

This was not carried out because of the lack of funding, and the tags were sent to Norway.

#### **Tagging of minke and fin whales in Svalbard:**

Four tags were used in Svalbard of which one was lost when the carrier bounced off the whale, causing the tag and carrier to separate. One tag hit a minke whale through the water but attached weakly. This tag initially provided positions on the first day, but then had periods with few uplinks, followed by a day with few positions, and eventually stopped transmitting. In another deployment on a minke whale the carrier did not release at the time of impact. It eventually released about 10-15 seconds later. While the tag gave some uplinks, it did not provide any positions.

In the third tag on a minke whale the carrier did not release at the time of impact but came off about 100 meters later when the whale started swimming.

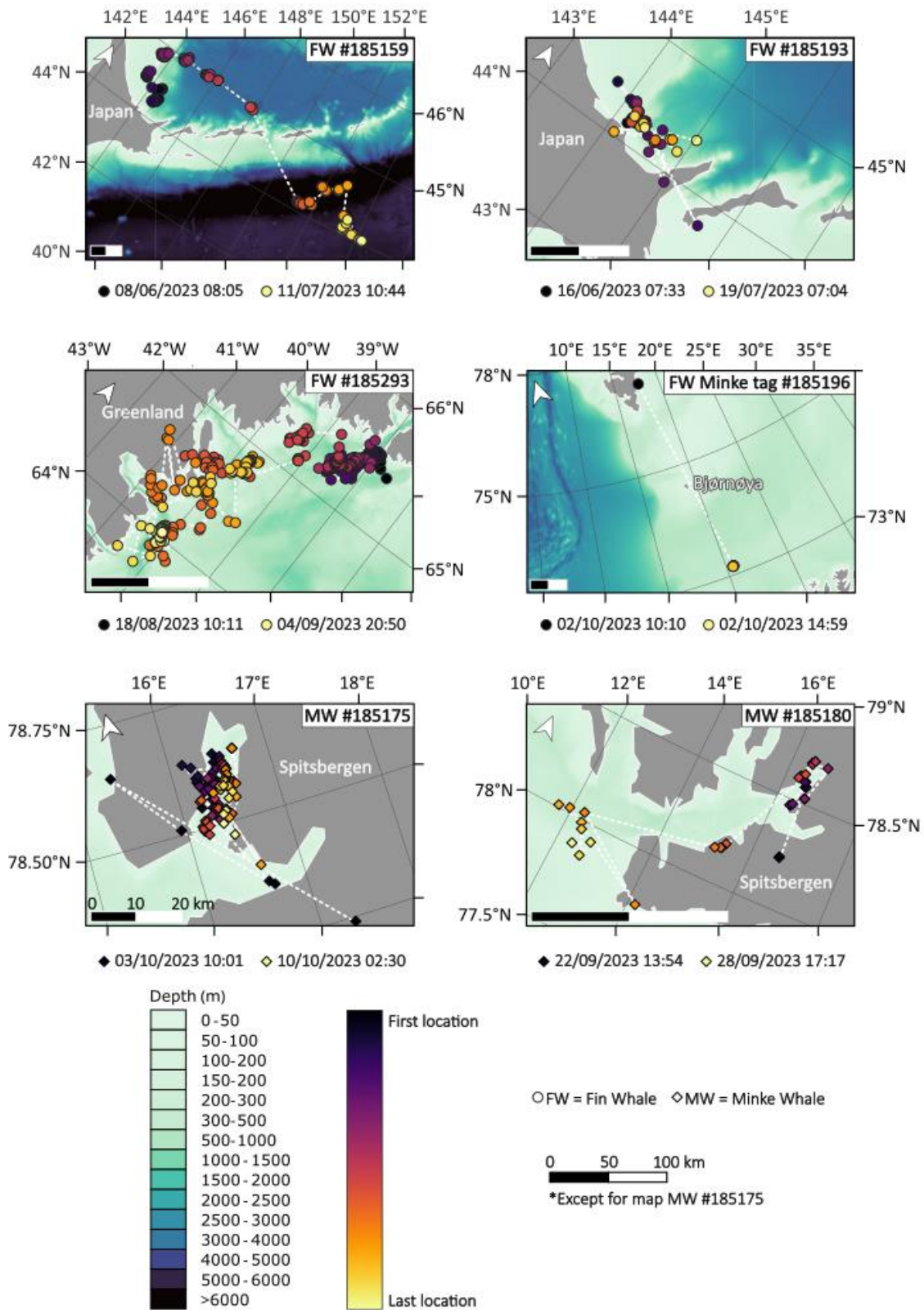


Figure 1. Tracking data of minke and fin whales with MINTAGs. These maps do not include the tagging conducted in Skjervøy in November 2023.

**Tagging of a fin whale with a minke whale tag in Norway:**

The tagging effort off the northern Norwegian coast and the southwestern Barents Sea faced challenges due to the priorities of the planned coast guard vessel that was supposed to be used for tagging. Despite these challenges, one fin whale was tagged with a minke whale tag off the northern Norwegian coast. The deployment appeared to be excellent, as a biopsy was successfully collected, and uplinks were received from the tag.

However, it is notable that no positions were acquired from the tag, and the exact reasons for this are unknown.

**Tagging of a humpback and killer whales with a minke whale tag around Skjervøy, Northern Norway:**

To assess the tag performance and collect more data on the tag performance, in November 2023, Audun Rikardsen and Marie-Anne Blanchet used the remaining minke and fin tags (9 in total) in northern Norway to tag killer and humpback whales. Six tags were successfully deployed, and three of them transmitted locations.

The tagging team could also follow closely the whales after tagging them and noticed some design challenges in the tags, such as the closeness, size, and shape of the retention cone, which could result in the tags moving out of the whale much quicker than expected. These observations were communicated to the StG, who will take these observations into account to design the future tags.

**3.3 Tagging performance and challenges**

In the summer of 2023, 23 tags were shot, one tag was broken and not used, and one tag disappeared. 19 tags were successfully deployed on whales and only 11 tags were transmitted location data (Figure 2).

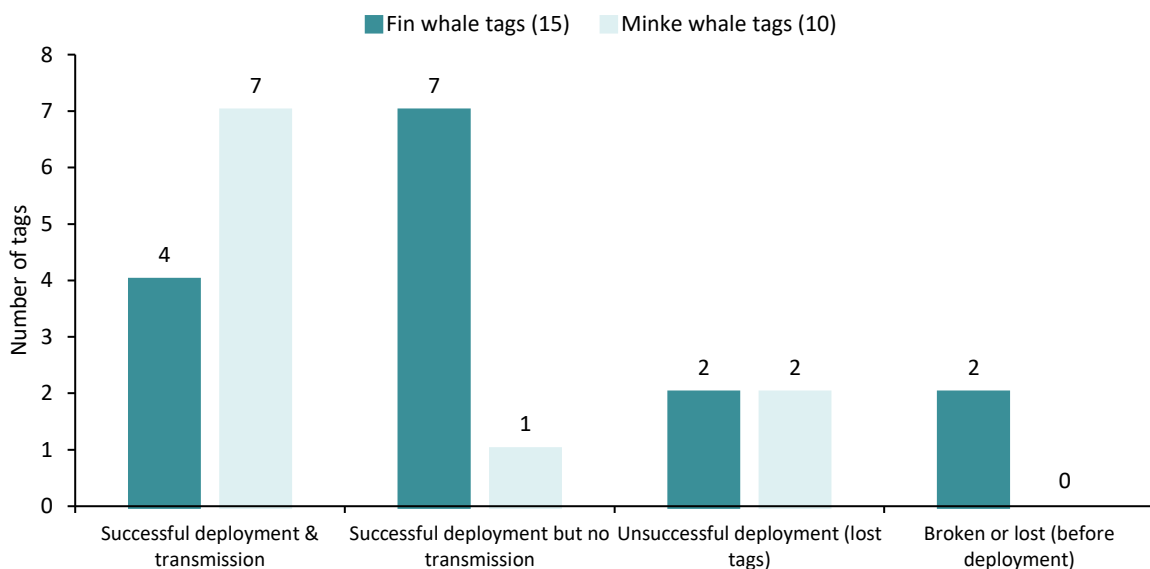


Figure 2. Performance of the MINTAG tags used in the summer of 2023.



The challenges experienced during the summer of 2023, highlight the complexities and uncertainties involved in tagging efforts, especially in field conditions with unpredictable factors. While some deployments were partially successful, others faced technical or operational issues that affected the data collected from the tags. The overall success of the summer 2023 deployment was not the expected one due to issues related to:

- Platform logistics: Iceland did not deploy the tags it had agreed to deploy, Greenland had to use a platform that was located too low and Norway did not succeed in deploying all its tags during the summer having to rely on external tagging Norwegian projects to use the leftover tags.
- Deployment issues: some tags were lost during the deployment.
- Issues with the transmission of the signal: several tags seemed to be deployed intradermally in the whales and did not give any signals or only transmitted for a few days if not hours.
- Short duration of the transmission: the working tags transmitted information for a maximum transmission period of 6 days and 32 days, for minke and fin whale tags respectively.

The electronic performance of the tags, including radio frequency characteristics, duty cycling and power output, was tested by Wildlife Computers, in an experiment that consisted of testing the electronics in a proven housing and deploying the tags on southern right whales in South America. The results of the test showed that the electronics are sound, providing further indication that the poor performance of the MINTAG tags is therefore probably the result of challenges in the mechanical design and deployment logistics (e.g., height off the water, distance to the whale).

#### 4. Updated plans for deployment of tags during the summer of 2024

In light of the difficulties encountered during the experimental deployments in 2023 the StG decided to conduct further tests of the tag design in 2024 before deploying a large number of MINTAG tags.



Figure 3. New design for MINTAG tags to be deployed in the summer of 2024, showing the variant with the retention cone (A) and the petal configuration (B), as well as the overall view of the improved carrier (C) and the new tip design (D).

The StG decided to focus on the development of the minke whale tag. Changes on the design of the minke whale tag, will also inform how to improve the fin whale tag.

The new design will generate two variants of the V0b Minke whale tag housing to determine which one performs better, enabling a comparison of their performance. The first variant will have a modified version of the retention cone (Figure 3A), while the second variant will have a petal configuration (Figure 3B). Both variants will share a series of modifications such as a concave cutting tip (Figure 3D), a newer version of the stop plate made of lightweight material and modifications on the carrier to enhance the flight, among other things (Figure 3C).

Given that 2024 will be an experimental year, the StG decided to keep the focus of the tagging efforts on areas with easier logistics and high density of target species, minke or fin whales. This means that MINTAG tagging will not be conducted in the Faroe Islands nor in Greenland in 2024. Instead, Iceland, Norway and Japan will test both variants of the tags in June, July and August 2024 (Table 1). It is imperative that the logistics are in place for the upcoming field efforts in 2024, as highlighted also by the SC30.

Table 2. Overview of desired tags from each team. CL=Christian Lydersen; KK=Kenji Konishi; MB=Martin Biuw; SG=Sandra Granquist. \*Planned tagging time by each team; note that the timing depends also on the possibility for delivering tags by WC.

Country	PI	Month*	Area	Target species	Tags needed
Japan	KK	April	North Pacific & Okhotsk Sea	Minke	10 (5 of each kind)
	KK	June to August		Baleen whales	
Norway	MB	Mid-May	Lofoten	Minke	10 (5 of each kind)
	MB	Mid-June (from 19/06) to mid-August	West Svalbard & Barents Sea	Minke and Fin	
	CL	Early July (from 07/07) to end of August	Svalbard	Fin	
Iceland	SG	Late July/August	Faxaflói or Akureyri	Minke	10 (5 of each kind)

## 5. Changes in project schedule

Following the unsuccessful deployment of V0 tags in the summer of 2023, the StG agreed to use the the summer of 2024 to further test prototype tags and tag design before coming up with a final tag. This decision results in a delay of a year in incurring planned expenses and therefore using the allocated funds. Table 3 presents the updated timeline per March 2024 (for comparison the timeline per March 2023 can be found in Appendix 3). The continued development of the tag housing during a year by WC will represent a cost that was not planned, and that will likely be taken from the fund originally allocating to buying final tags.

Table 3. Updated timeline of the MINTAG project per March 2023.

	2021		2022				2023				2024				2025				2026				2027				2028+
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
<b>Steering Group</b>																											
Launch, Tender																											
Choice Manufacturer / signature				May 22																							
<b>Tag development WLC</b>																											
DVPT V0 + carrier																											
Shipment 10 V0 housing + carrier w.bs				Jul 22				Apr & Jun 23																			
DVPT V0b + carrier bs																											
Shipment 25 V0b housing + carrier w.bs								May 23																			
DVPT V0c + carrier																											
Shipment 30 V0c housing + carrier												May 24															
DVPT V1 + carrier bs																											
Shipment 225 V1 housing + carrier w.bs															Feb 25					Feb 26							
<b>Testing: Consortium</b>																											
Tests w. 10 dummy V0 tag																											
DVPT instrumentation protocol																											
Deploy 25 V0b								25																			
Deploy 30 V0c												30															
<b>Deployment Tags: Consortium</b>																											
Deploy 225 V1																125?				100?							
<b>Data collection: Consortium / ARGOS</b>																											
25 V0b - Argos time																											
30 V0c - Argos time																											
125 V1 - Argos time																											
100 V1 - Argos time																											
<b>Analysis: Consortium</b>																											
Database (NAMMCO SEC)																											
Analysis																											
Writing																											
<b>Dissemination: Consortium</b>																											
Website (NAMMCO SEC)																											
Education material (NAMMCO SEC)																											
Publication																											
Project Workshop																											
<b>Reporting SC/Council/FAJ</b>																											

## 6. Project dissemination

The [MINTAG website](#), launched the 1 November 2022, offers information on the project: background and aim, target species, project partners and participating institutes, StG, and timeline. It provides also updated activities of the StG, both meetings and field tests, as well as maps with the tracks of the tagged whales (Figure 4). The MINTAG website is also used as an archive and data storage for the Project.

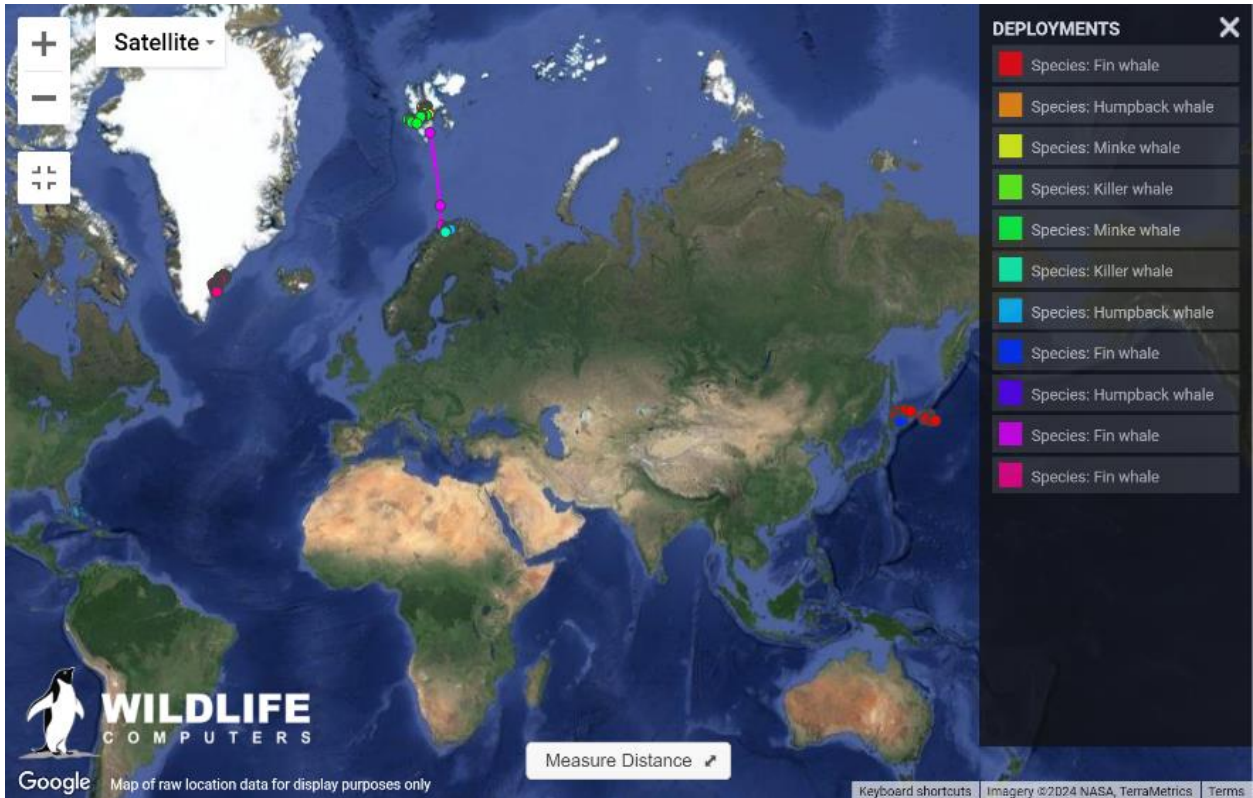


Figure 4. Tracks of tagged whales that successfully transmitted location data during the summer of 2023.

During the tagging season, scientists from the StG participating in the field efforts were asked to submit videos based on interviews for dissemination purposes. These videos were subsequently published on the NAMMCO Instagram and Facebook accounts (see for example, interview to [Rikke Guldborg Hansen](#), [Mads Peter Heide-Jørgensen](#) and [Kenji Konishi](#)).

The website has attracted 1,211 users since its launch on November 1, 2022. Most users (1,009) visited the site during the period from February 27, 2023, to February 27, 2024. The users are primarily from the USA, Norway, India, Japan, and Denmark. The most popular pages on the site are the landing page and "Follow the Whales" (Figure 5). The website is regularly updated to provide the latest information on tagged whales and tagging teams.

## MINTAG Website Report 27 Feb 2023 - 27 Feb 2024

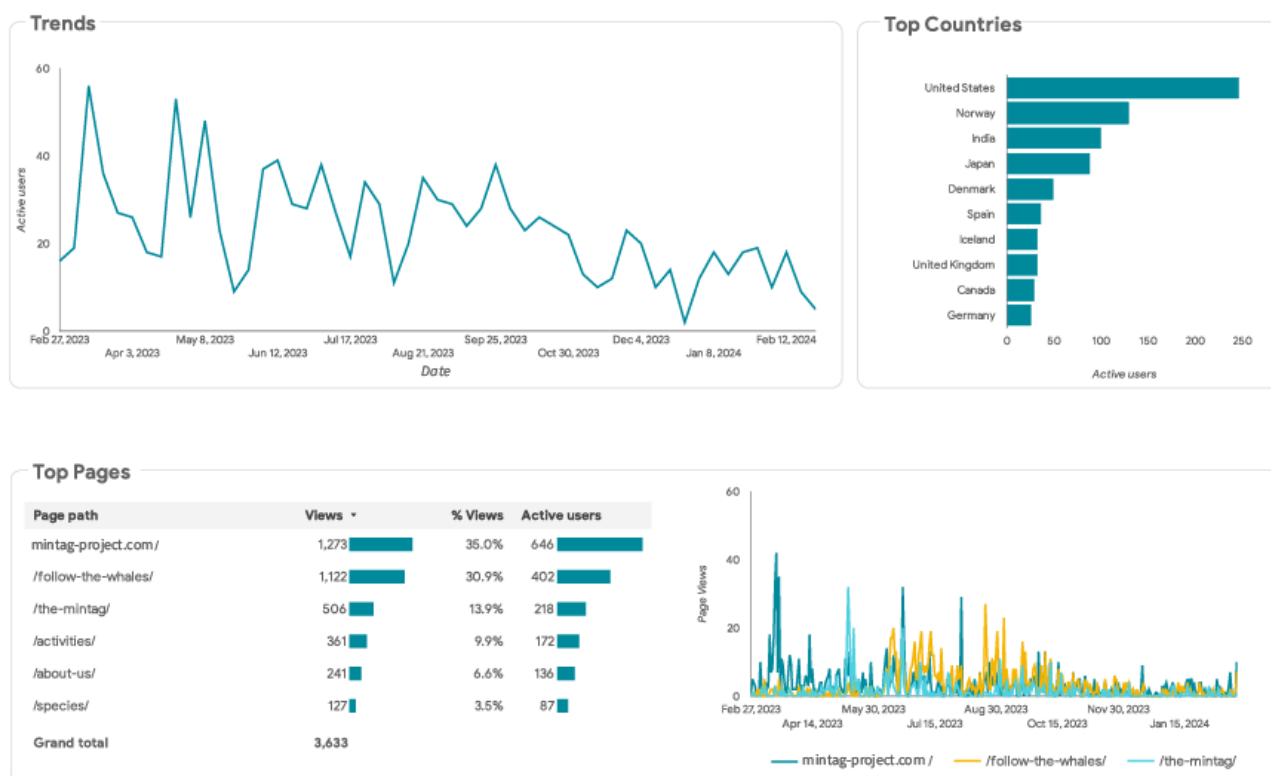


Figure 5. MINTAG Website audience demographics and interests' overview for the period from February 27, 2023, to February 27, 2024 (source: Google Analytics)

## 7. Financial update

### 7.1 Project-based cooperation between NAMMCO and Japan

Table 4 provide the overall initial budget of the project, and the repartition between partners, agreed upon in July 2021, before the launching of the Project.

Table 4. Overall agreed budget of the MINTAG project and repartition between partners.

Overall project	TOTAL COST	NO	FO	GL	IS	Commission	NAMMCO Total	JAPAN
Direct	10,315,000	2,737,500	159,000	484,000	50,000	755,000	4,185,500	6,129,500
%		26.5%	1.5%	4.7%	0.5%	7.3%	41%	59%
In kind	16,116,000	8,024,000	1,080,000	2,774,000	1,790,000	-	13,668,000	2,448,000
%		49.8%	6.7%	17.2%	11.1%	0.0%	85%	15%
<b>Total</b>	<b>26,431,000</b>	<b>10,761,500</b>	<b>1,239,000</b>	<b>3,258,000</b>	<b>1,840,000</b>	<b>755,000</b>	<b>17,853,500</b>	<b>8,577,500</b>
%		40.7%	4.7%	12.3%	7.0%	2.9%	68%	32%

Some changes to the original budget were made when the agreement with WC was signed, based on the real cost agreed with the manufacturer (prices given in US dollars). Some expenses that had not been accounted for in the original project description were also added.

A change in cost will originate in the changes in exchange rate between US dollars and NOK, which is not favourable to the project, and may significantly increase the cost of the US produced development and tags. Table 5 below provides the original itemised project budget and illustrates the increased in costs resulting from the increase in exchange rate until March 2023, that the project partners will need

to address. However, by 03 March 2024, the exchange rate is 10.56, i.e., less than on 17 March 23. This increasing tendency in manufacturer cost may stop, however the exchange rate between US dollars and NOK is fluctuating very much.

Table 5. Initial project budget compared to added costs and changes due to an increasing exchange rate (Table also provided in last report).

ITEMS	Original Project Budget	Anticipated budget w. WC as manufacturer			
		WC / US \$	By 250222	By 240722	By 170323
			NOK (conv: 9,12)*	NOK (conv: 9.97)	NOK (conv: 10.67)
<b>Revised cost</b>					
Development costs	1,980,000				
Purchase 10 dummy tags	20,000	210,000	1,915,200	2,093,700	2,240,700
Purchase 25 V0b test tags + five carriers	625,000				
Purchase 5 extra carriers	?	2,000	18,240	19,940	21,340
Purchase 225 V1 tags	5,625,000	438,750	4,001,400	4,374,338	4,681,463
Purchase 85 carriers w. biopsy samplers	?	34,000	310,080	338,980	362,780
ARTS guns	?		60,000	60,000	60,000
Argos cost**	705,000		2,794,500	2,794,500	2,794,500
Scientists to test sites/carcasses	150,000		500,000	500,000	500,000
Meeting with WLC	?				
Freight, customs, brokerage	?		50,000	50,000	50,000
<b>Unchanged cost</b>					
Project administration	620,000		620,000	620,000	620,000
Database + website	390,000		390,000	390,000	390,000
Project workshop	200,000		200,000	200,000	200,000
<b>Total</b>	<b>10,315,000</b>		<b>10,859,420</b>	<b>11,441,458</b>	<b>11,920,783</b>

\*Exchange rate taken as \$: 9,12, as highest over past year til 250222 - when WC prices we communicated

\*\*New Argos price calculated using a max budget of 63€/month/tag (as given by Argos), but very optimistically assuming all tags deployed the same month, July for V0b tags in 2023, and May for V1 tags in 2024 and 2025, and then working until the end of the following year. It is then assumed a coefficient of 10% failure. Argos informed that the price will likely go down.

## 7.2 Agreed contributions and payment status

The MINTAG project was launch on 4 August 2021, i.e., ca. 9-month later than described in the original project description, in turn this resulting in a year delay in most planned activities, especially field works. Consequently, the direct project expenses, i.e., cost of the development work by WC and field work by the partners, started in 2022 instead of 2021.

Despite the delay in the project and therefore in incurring expenses, **the five partners agreed that the transfer of the agreed funding follows the initial schedule.** The protracted use of the funds would hopefully cover costs until the end of the project in 2027, which will now be in 2028 because of the second year of experimental tagging in summer instead of large tag deployment.

Table 6 provide the detail of the partner funding in 2023. The Fishery Agency of Japan (FAJ) could not commit to the agreed funding for the financial year 2023-2024, because of financial uncertainties and unfavourable exchange rate. However, the Instituted of Cetacean Research of Japan committed to compensate for the deficit incurred (NOK 555,329) by buying tags. Table 6 also indicates the in-kind money provided by NAMMCO as work time of the Secretaries involved in the administration of the project (note that the time of the interns and part time assistant are billed to the project).

Fund requisition for the financial year 2024 for NAMMCO partners and the financial year 2024-2025 for Japan have not been sent yet, and therefore not received.

Table 6. Committed and received funding from the project partners

PARTNERS' PLANNED and COMMITTED FUNDING 2021-2026 by 03 March 2024													
Country	Total Funding	Funding 2021		Funding 2022		Funding 2023		Funding 2024		Funding 2025		Funding 2026	
		Agreed	Received	Agreed	Received	Agreed	Received	Agreed	Received	Agreed	Received	Agreed	Received
Faroe Islands	159,000	85,000	85,000	74,000	74,000	-	-	-	-	-	-	-	-
Greenland	484,000	40,000	137,950	234,000	134,850	70,000	69,950	70,000	-	70,000	-	-	-
Iceland (MRI)	50,000	-	-	50,000	49,950	-	-	-	-	-	-	-	-
Norway	2,737,500	595,000	595,000	910,000	910,000	700,000	700,000	332,500	-	150,000	-	50,000	-
Japan	6,129,500	545,000	545,000	1,813,000	1,813,000	1,963,000	1,430,408	1,645,500	-	113,000	-	50,000	-
NAMMCO direct	755,000	50,000	50,000	150,000	150,000	175,000	175,000	180,000	-	100,000	-	100,000	-
<b>Total Direct</b>	<b>10,315,000</b>	<b>1,315,000</b>	<b>1,412,950</b>	<b>3,231,000</b>	<b>3,131,800</b>	<b>2,908,000</b>	<b>2,375,358</b>	<b>2,228,000</b>	<b>0</b>	<b>433,000</b>	<b>0</b>	<b>200,000</b>	<b>0</b>
Secretariat in kind	-	-	54,815	-	115,215	-	86,905	-	-	-	-	-	-
<b>Total</b>		<b>1,315,000</b>	<b>1,467,765</b>	<b>3,231,000</b>	<b>3,247,015</b>	<b>2,908,000</b>	<b>2,462,263</b>	<b>2,228,000</b>	<b>0</b>	<b>433,000</b>	<b>0</b>	<b>200,000</b>	<b>0</b>
Funds only transferred to the MINTAG konto in 2022													
This includes what was left on the Japanese account at the end of 2022 (503,755NOK), what was received in 2023 (903,916NOK) & interests received in 2023 (22,737NOK)													

### 7.3 Cost and expenses in 2022 and 2023

Table 7 presents the cost budgeted for the tag development, and reports on the expenses incurred in 2022 and 2023.

Table 7. Budgetted cost for the tag development and expenses incurred in 2023 and 2023

ITEMS	BUDGET (NOK)	WC products / US \$	Expected expenses at 240722 /NOK (9.97)	EXPENSES 2022	EXPENSES 2023
				(NOK)	(NOK)
Development costs, incl. dummy tag for testing in 2022 and 2023, and related carriers, as well 25 VOB prototype tags and 5 VOB carriers		105,000	1,046,850	1,022,258	
		105,000	1,046,850		827,122
Purchase of 5 extra carriers		2,000	19,940		
Purchase 225 V1 tags		438,750	4,374,338		
Purchase 85 carriers w. biopsy sampler		34,000	338,980		
ARTS guns (see Figure 3)			60,000	59,174	
Argos cost**			2,794,500		15,738
Scientists to test sites/carcasses			150,000	128,696	30,875
Meeting with WLC				19,853	
Freight, customs, brokerage			50,000		
Project administration & dissemination (meetings, reporting, dissemination, website maintenance)			620,000	245,858	190,449
Database + website (direct costs)			390,000	2,612	1,019
Project workshop			200,000		
<b>Total</b>			<b>11,091,458</b>	<b>1,478,451</b>	<b>1,065,204</b>

## 8. Short evaluation of the progress of the project

Although the project was developing well, the summer 2023 experimental deployments revealed logistic and functional difficulties. The results obtained with the tag deployed were very poor, both in terms of tag retention and transmission. In light of the difficulties encountered, the StG decided to conduct in 2024 further tests of the tag housing design before purchasing and deploying a large number of MINTAG tags. The project is therefore delayed by a further year.

**The need for further design of the tag housing (which is presently done by WC) requires more work than anticipated from the tag developer, thus generating an extra cost for the project, which was not included in the original budget, and that the partners will have to address.**

The scientists involved remain optimistic with the outcome of the project. For the success of the project, it remains essential that the funding from the partners originally agreed upon, both in kind and direct, continues to be delivered.

## APPENDIX 1: OVERVIEW OF PROJECT ACTIVITIES SINCE JULY 2021 (SIGNING OF THE COOPERATION AGREEMENT)

The table below provide an overview of the StG's meeting and other activities since the launching of the project in July 2021.

Month Year	Activity	Participants	Description
<b>August 21</b>	StG 1 (online)	FO, GL, IS, JP, NO, SEC	Presentation of participants, review of budget, review of draft tender material to potential manufacturers, review of 1 <sup>st</sup> project blog, agreement on autumn 2021 and winter 2022 project schedule. [04.08.2021]
<b>November 21</b>	StG 2 (online)	FO, GL, IS, JP, NO, SEC	Review of the manufacturers proposals, formulation of concerns and issues to be raised with the manufacturers. [24.11.2021]
<b>December 21</b>	PL / WC (physical)	Project Leader (PL) and WC CEO and engineers	Presentation of concerns and questions about the production and deliveries.
<b>February 22</b>	StG 3 (online)	FO, GL, IS, JP, NO	Comparison of the two manufacturers proposal and decision on the manufacturer. [22.02.2022]
<b>March 22</b>	Webinar kickoff by WC (online)	StG (FO, GL, IS, JP, NO, SEC) + WC CEO, scientists, and engineers	WC presentation of their project, incl. update upcoming opportunities for satellite communication, discussion on tag design. [24.03.2022]
<b>June 22</b>	Financial agreement (online)	NAMMCO GS & Deputy Secretary, WC CEO, PL	Discussing the terms of the financial agreement and MoU. [14.06.2022]
<b>June 22</b>	Financial agreement (online)	NAMMCO GS, WC CEO & one scientist	Continuing discussing the terms of the financial agreement and MoU. [17.06.2022]
<b>June 22</b>	MoU	NAMMCO GS, WC CEO	The MoU between NAMMCO and Wildlife Computers is signed by both parties. [22.06.2022]
<b>July 22</b>	Testing of dummy tag housing (IS)	PL, FO, NO, WC engineers	Testing of tag housing and launcher characteristics at the Icelandic whaling station on fin whale carcasses. [10-16.07.2022]
<b>Summer - Fall 22</b>	Website development	NAMMCO Sec	Development of the project website by the NAMMCO Secretariat.
<b>September 22</b>	StG 4 meeting (online)	StG (FO, GL, IS, JP, NO, FAJ, SEC)	Review of summer test shootings, tag design & meeting with WC, project website, plans & schedule for 2023, data depository, budget. [09.09.2022]
<b>October 22</b>	Tag Design WS/StG 4 (DK)	StG / WC / SEC	Refinement of the tag design, including carriers and biopsy samplers. [25-26.10.2022]
<b>November 22</b>	Launch of the MINTAG website	SEC	The website <a href="http://mintag-project.com">mintag-project.com</a> was launched. [1.11.2022]



<b>January 23</b>	Testing of retention cones (FO)	FO	The objective of the test was to investigate how well different retention cones contribute to the anchoring of a minke whale tag in the whale body. [13.01.2023]
<b>January 23</b>	StG 5 meeting (DK, during SC29)	StG (FO, GL, IS, JP, NO, SEC)	Refinement of the tag design, development of tagging protocol for the deployment of the MINTAG V0b in spring-summer 2023. [24.01.2023, during SC29 meeting]
<b>February 23</b>	Testing of stop-plates and retention cones (JP)	JP	The objective of the test was to investigate how well the stop-plates and retention cones work. [09.02.2023]
<b>February 23</b>	Testing of ballistics (DK)	GL	The purpose was to test the ballistics of different tags. [28.02.2023]
<b>March 23</b>	Reporting to NAMMCO and JP	NAMMCO Sec and StG	Reporting to the Fisheries Agency of Japan and to the FAC and Council of NAMMCO (30 <sup>th</sup> Annual Meeting)
<b>March 23</b>	Ballistics tests	StG (GL)	Objective: to test the ballistics of the fin whale tag [28.03.23, DK]
<b>June 23</b>	Ballistics tests	StG (GL) / WC	Objective: to test to precision of the minke and fin whale tags during target shooting and to test the ballistics of a fin whale tag with only a 10 cm shaft. [28-29.06.23, DK]
<b>June 23</b>	Tag deployment	JP	Deployment of five fin whale tags on fin whales [05-15.06.23, southern Okhotsk Sea, JP] <ul style="list-style-type: none"> <li>▪ Lost after deployment: 0/5</li> <li>▪ Transmitted location: 2/5</li> </ul>
<b>August 23</b>	Tag deployment	GL	Deployment of five fin whale tags on fin whales [08-17.08.23, East Greenland, GL] <ul style="list-style-type: none"> <li>▪ Lost after deployment: 1/5</li> <li>▪ Transmitted location: 1/5</li> </ul>
<b>August-September 23</b>	Tag deployment	NO	Deployment of three minke whale tags (MWT) on minke whales and one fin whale tag (FWT) on a fin whale. [15.08-15.09.23, Svalbard, NO] <ul style="list-style-type: none"> <li>▪ Lost after deployment: 0/3 (MWT), 1/1 (FWT)</li> <li>▪ Transmitted location: 2/3 (MWT), 0/1 (FWT)</li> </ul>
<b>August-September 23</b>	Tag deployment	NO	Deployment of one minke tag on a fin whales [31.08-20.09.23, Barents Sea, NO] <ul style="list-style-type: none"> <li>▪ Lost after deployment: 0/1</li> <li>▪ Transmitted location: 1/1</li> </ul>
<b>September 23</b>	Deployment tests	StG / WC	Objective: to test the deployment of dummy tags on fin whales at the whaling station in Iceland. [7-12.09.23, Hvalfjörður, IS]
<b>October 23</b>	StG 7 meeting to discuss the deployments during the summer of 2023	StG / Sec	Each partner presented the field efforts and the StG discussed potential solutions to the encountered problems. [10.10.23, online]
<b>October 23</b>	Tag deployment	NO (External Group)	Deployment of eight tags (unused tags) on killer and humpback whales [16-21.10.23, Skjervøy, NO] <ul style="list-style-type: none"> <li>▪ Lost after deployment: 2/6 (MWT), 0/2 (FWT)</li> <li>▪ Transmitted location: 4/6 (MWT), 1/2 (FWT)</li> </ul>

			<ul style="list-style-type: none"> <li>▪ Remaining tags after field season: two broken FWT</li> </ul>
<b>November 23</b>	Summary of deployment in Skjervøy	StG / Sec / External Group	Audun Rikardsen (external group), who deployed the remaining tags in Skjervøy, presented the performance of the field efforts. [28.11.23, online]
<b>November 23</b>	Performance of the electronics of the tags	StG / WC / Sec	WC presented their experiments and results to test the tag performance. [28.11.23, online]
<b>January 24</b>	StG 8 meeting to decide on the new design and upcoming plans	StG / WC / Sec	The StG and WC met to decide upon the new tag design for the upcoming tagging season. [21-22.01.24, Hafnarfjörður, IS]
<b>March 234</b>	Reporting to NAMMCO and JP	NAMMCO Sec and StG	Reporting to the Fisheries Agency of Japan and to the FAC and Council of NAMMCO (31 <sup>st</sup> Annual Meeting)

## APPENDIX 2: OVERVIEW OF TAGGING EFFORTS

A. **Minke whale tags.** In parentheses the name of the PI in charge of the deployment is indicated: AR = Audun Rikardsen; CL = Christian Lydersen; MB = Martin Biuw

PTT ID	Country	Species	Deployed	Transmitted locations	Minimum duration of deployment <sup>1</sup>	Duration of transmission <sup>2</sup>
185196	Norway (MB)	Fin whale	Yes	Yes	20d 5h 23m	2d 5h 40m
185175	Norway (CL)	Minke whale	Yes	Yes	16d 13h 30m	6d 16h 28m
185180	Norway (CL)	Minke whale	Yes	Yes	6d 5h 47m	6d 3h 22m
185178	Norway (CL)	Minke whale	Yes	No		
185176	Norway (AR)	Killer whale	Yes	Yes	3d 6h 12m	3d 2h 47m
185172	Norway (AR)	NA	Yes – lost			
185184	Norway (AR)	Killer whale	Yes	Yes	7d 7h 47m	0d 0h 7m
185188	Norway (AR)	Humpback whale	Yes	Yes	3d 9h 28m	3d 8h 38m
185189	Norway (AR)	NA	Yes – lost			
185194	Norway (AR)	Humpback whale	Yes	Yes	0d 0h 52m	0d 0h 18m
<b>Total Minke tags with successful deployment &amp; location transmission</b>						<b>7</b>
<b>Total Minke tags successfully deployed but not transmitting locations</b>						<b>1</b>
<b>Total Minke tags lost</b>						<b>2</b>
<b>Average minimum duration of deployment</b>						<b>8d 3h 34m</b>
<b>Average duration of transmission</b>						<b>3d 1h 54m</b>

- B. **Fin whale tags.** In parentheses the name of the PI in charge of the deployment is indicated:  
 AR = Audun Rikardsen; CL = Christian Lydersen; KK = Kenji Konishi; MPHJ = Mads Peter Heide  
 Jørgensen

PTT ID	Country	Species	Deployed	Transmitted locations	Minimum duration of deployment <sup>1</sup>	Duration of transmission <sup>2</sup>
185159	Japan (KK)	Fin whale	Yes	Yes	34d 8h 37m	33d 2h 39m
185193	Japan (KK)	Fin whale	Yes	Yes	33d 6h 50m	32d 23h 32m
185161	Japan (KK)	Fin whale	Yes	No		
185162	Japan (KK)	Fin whale	Yes	No		
185168	Japan (KK)	Fin whale	Yes	No		
185293	Greenland (MPHJ)	Fin whale	Yes	Yes	18d 6h 50m	17d 10h 38m
185181	Greenland (MPHJ)	Fin whale	Yes	No		
185186	Greenland (MPHJ)	Fin whale	Yes	No		
185187	Greenland (MPHJ)	Fin whale	Yes	No		
185273	Greenland (MPHJ)	Fin whale	Yes - lost			
185192	Norway (CL)	NA	Yes - lost			
185163	Norway (AR)	NA	No – did not work			
185173	Norway (AR)	Humpback whale	Yes	Yes	0d 8h 43m	0d 8h 24m
185174	Norway (AR)	Humpback whale	Yes	No		
185183	Norway (AR)	NA	Lost			
<b>Total Fin tags with successful deployment &amp; location transmission</b>						<b>4</b>
<b>Total Fin tags successfully deployed but not transmitting locations</b>						<b>7</b>
<b>Total Fin tags lost/broken</b>						<b>4</b>
<b>Average minimum duration of deployment</b>						<b>21d 13h 45m</b>
<b>Average duration of transmission</b>						<b>20d 23h 18m</b>

<sup>1</sup>Minimum duration of deployment = Last uplink – Deployment date

<sup>2</sup>Duration of transmission = Last uplink – First date of transmission after deployment

**APPENDIX 3: MINTAG PLAN AS PER MARCH 2023**

Note that this table is now outdated and that an updated version is presented under item 4 of this report.

	2021		2022				2023				2024				2025				2026				2027				2028+	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
<b>Steering Group</b>																												
Launch, Tender																												
Choice Manufacturer / signature				May 22																								
<b>Tag development WLC</b>																												
DVPT V0 + carrier																												
Shipment 10 V0 housing + carrier w.bs					Jul 22				Apr & Jun 23																			
DVPT V0b + carrier bs																												
Shipment 25 V0b housing + carrier w.bs										May 23																		
DVPT V1 + carrier bs																												
Shipment 225 V1 housing + carrier w.bs											Feb 24				Feb 25													
<b>Testing: Consortium</b>																												
Tests w. 10 dummy V0 tag																												
DVPT instrumentation protocol																												
Deploy 25 V0b										25																		
<b>Deployment Tags: Consortium</b>																												
Deploy 225 V1												125				100												
<b>Data collection: Consortium / ARGOS</b>																												
25 V0b - Argos time																												
125 V1 - Argos time																												
100 V1 - Argos time																												
<b>Analysis: Consortium</b>																												
Database (NAMMCO SEC)																												
Analysis																												
Writing																												
<b>Dissemination: Consortium</b>																												
Website (NAMMCO SEC)																												
Education material (NAMMCO SEC)																												
Publication																												
Project Workshop																												
<b>Reporting SC/Council/FAJ</b>																												