

The Plight of the Okinawan Dugong:
An Okinawan Civil Society Critique of the Government of Japan's Environmental
Impact Assessment and the U.S. Department of Defense's Response

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In April 2014, the U.S. Department of Defense (DoD) notified the Federal District Court of San Francisco that it had completed its “take into account” process in accordance with the 2008 court’s order under the U.S. National Historic Preservation Act (NHPA) and released a 25-page document entitled “The U.S. Marine Corps Recommended Findings, April 2014” (hereafter: The Findings). This document summarized the Dugong case, the DoD’s “take into account” process, and conclusions emerging from the process. The DoD was ordered by the District Court to answer a loaded and unprecedented question: would the construction and operation of a U.S. military base in Henoko-Oura Bay have adverse effects on Japan’s Natural Monument, the dugong? The DoD provided its answer in simple terms.

The Findings stated:

The USMC [United State Marine Corps] below presents its findings in two categories: construction effect and operational effect. The overall determination of effect for the Undertaking (construction and operation of the base) is “no adverse effect” on the Okinawa dugong, because of the extremely low probability of Okinawa dugongs being in the APE [Area of Potential Effects]; or should dugongs in fact be present, the construction and operational activity is primarily of the type that would not have an adverse effect. The exception to this, as discussed in Section 3.2.4, is construction noise; however, the GoJ [Government of Japan] has committed to noise minimization and monitoring efforts that the USMC finds likely to be effective in avoiding or minimizing impacts on dugongs if they are present during construction. (p.12)

The Findings held that dugong activities were concentrated “mostly off Kayo,” north of

Oura Bay, and away from the construction site.¹

The DoD's notification and issuance of the Findings moved base construction to the next phase as it enabled the DoD to grant permission to the Okinawa Defense Bureau for construction work. In July 2014, the Bureau started transporting sand and rocks first onto the ground of Camp Schwab, adjacent to Henoko-Oura Bay. Then, in August 2014, the Bureau began drilling surveys on the Oura Bay side of the construction site. Despite finding 77 dugong feeding trails directly on the Oura Bay side of the construction site between April and July in 2014,² the Okinawa Defense Bureau did not refrain from starting construction work.

From September 2018, the Bureau was no longer able to sight any dugongs on the east coast of northern Okinawa Island, including the off Kayo area, and from December 2018, it was no longer able to find any dugong feeding trails there. Since the death of a female dugong in March 2019, no dugong has been sighted in Okinawan waters.

In December 2019, noting this situation, the International Union for Conservation of Nature (IUCN) placed the Dugongs in the Nansei region (including the waters of Okinawa Island) in the category of *Critically Endangered* on its Red List (Brownell, Kasuya and Marsh 2019).³ The IUCN's listing is in stark contradiction to the DoD's conclusion in the Findings: "the construction and operation of the FRF will not have adverse effects on the local Okinawa dugong population and consequently will not substantially contribute to the extinction of the entire Okinawa dugong" (p.17).

¹ The Findings' descriptions of the importance of "off Kayo" for the dugong include "More

² Okinawa Defense Bureau and Idea Co. (2015). *Schwab (H25) Sui-iki seibutsu to chosa Hokokusho* [Schwab (H25) Aquatic Organisms Surveys: Report]. See Table 4.2.2-1 on p. 556 of the Report for details at:

<https://drive.google.com/file/d/15jAGRVCqobmP-JxkivVwrKkUhqAV3mPK/view>. Accessed June 19, 2020.

Unlike other reports by the Bureau, this particular report has never been available on the Bureau's website. It was obtained via the National Diet member Seiken Akamie.

³ Brownell Jr., R.L., Kasuya, T. & Marsh, H. (2019). *Dugong dugon (Nansei subpopulation)*. *The IUCN Red List of Threatened Species* 2019: e.T157011948A157011982. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T157011948A157011982.en>. Accessed on May 21, 2020. While the assessment of the Dugong in the Nansei region was made in August 2019, the listing on the Red List was made in December 2019.

Then, in February 2020, for the first time in nearly one year, the sound of dugong calls was detected by the Okinawa Defense Bureau's underwater recording device in the middle of Oura Bay near the construction site when no construction work was taking place.⁴

How is it that the conclusions presented in the DoD's Findings became detached from reality? What is the relationship between construction work and this urgent situation of the Okinawa dugong? Why and how have the national systems of the Japanese EIA and the U.S. NHPA's "take into account" process led to this situation? What should be done to save the Okinawa dugong?

The following analysis constitutes a critique of the DoD's Findings issued as part of its "take into account" process and its follow-up activities subsequent to start of construction. It is not so much directed at the Findings or the DoD's follow-up activities per se as it is designed to show how the DoD has allowed the flaws of the Okinawa Defense Bureau's Environmental Impact Assessment (EIA) and the Bureau's failure to implement critical mitigation measures to undermine and compromise the DoD's efforts to comply with the U.S. laws and regulations concerning the conservation of the Okinawa dugong. Above all, this critique contends that Henoko-Oura Bay remains critical habitat for the Okinawa dugong population and that the DoD and relevant U.S. federal institutions review the DoD's commitments to the conservation of the Okinawa dugong in relation to the construction and operation of the base at Henoko-Oura Bay.

Construction Work and "Critically Endangered" Okinawa Dugong

Compounded and delayed by political decisions, legal battles, weather conditions, local protest, and numerous flaws in the Okinawa Defense Bureau's EIA,⁵ base construction

⁴ Okinawa Defense Bureau (May 2020). *Kojino jishi jyokyo nit suite shiryō* 5 [Appendix 5, Report on the Progress of Construction Work]. https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/kankyokansiiinkai/kankyokansiiinka_i26/R02no26Siryo05.pdf. Assessed on June 10, 2020.

⁵ For detailed description of the twenty-year history of the relationships among the Japanese government, the U.S. government, and the people of Okinawa regarding the construction of the base at Henoko-Oura Bay, see McCormack, Gavan (2020). "Okinawa: Japan's Prefecture that

work at Henoko-Oura Bay has been slow since it started in July 2014 and it will undoubtedly face further delays and stoppages in the future. However, construction work has been accompanied by disquieting changes in the behaviors of the three dugongs identified by the Okinawa Defense Bureau as A, B, and C.⁶ Those changes may be taken as disturbing indicators of the impact of construction work on the population of the Okinawa dugong.

Flaws in Okinawa Defense Bureau's EIA have frequently given rise to delays in the construction work. In August 2018, the Okinawa Prefectural Government revoked the land reclamation permit for base construction granted by former Okinawa Governor Hirokazu Nakaima,⁷ and construction work was halted for two months. The Prefectural Government determined that the information that emerged after the start of construction work, such as the presence of "extremely soft seafloor" and an active fault at the construction site, rendered the site "inconsistent with the requirements" for a suitable site.⁸ The Prefectural Government also discerned that even when many of the Bureau's mitigation measures were implemented they proved inadequate. For example, the Prefectural Government (2018) found that "regarding growth, movement monitoring, and alert subsystems, it is impossible to accurately judge the impact on the dugong due to construction unless these are installed not only in the marine construction area but also in Oura Bay" (Okinawa Prefectural Government (2018, p.27). In November 2018, however, the Japanese Government overrode the Prefectural Government's revocation

Keeps Saying No," *The Journal of Social Science*. Vol. 87., pp. 143-173.
<http://id.nii.ac.jp/1130/00004644/>. Accessed on May 23, 2020.

⁶ The Okinawa Defense Bureau has not established the population size of the dugong in the waters of Okinawa. The Findings acknowledged that "the available data are sufficient to conclude that a remnant population of dugongs exists around Okinawa" while recognizing that "estimates made over the past thirteen years of the Okinawa dugong population range between 3 to 50 individuals." (p.12)

⁷ Former Okinawa Governor Hirokazu Nakaima granted the land reclamation permit to the Okinawa Defense Bureau in December 2013 as he accepted the Bureau's EIA conclusion that the base would have "no adverse effects" on the environment and the Bureau would implement effective mitigation measures.

⁸ The Okinawa Prefectural Government has translated the revocation documents into English to garner the U.S. government's understanding of the permit's revocation. For details of reasons for revoking the land reclamation permit, see Okinawa Prefectural Government (2018/2019).

Appendix" for Notice of Revocation of Approval for Reclamation of Public Waters.

<https://www.pref.okinawa.jp/site/chijiko/henoko/documents/appendix.pdf>. Accessed on May 23, 2020.

and resumed construction. (In March 2020, the Okinawa Prefectural Government lost its suit against the Japanese Government in the Japanese Supreme Court over the issue of the revocation.⁹)

Flaws in the Okinawa Defense Bureau's EIA have also impacted the scheduling of the DoD's realignment plans in the Asia-Pacific region of which the construction of the base is a centerpiece. Despite declaring its EIA completed in December 2012, the Bureau had to conduct further drilling surveys on the Oura Bay side of the construction site from August 2014 to 2019. Those post-EIA drilling surveys revealed that the seafloor on the Oura Bay side of the construction site is extremely fragile (N-value 0), requiring substantial changes in construction design and major reinforcement work.¹⁰ The Bureau has acknowledged that 71,000 sand compaction piles need to be implanted into the seafloor as deep as 300 feet below the water surface.¹¹ Accordingly, the completion date for the base has now been pushed from 2022 or 2026 as originally spelled out¹² to sometime in the 2030s.¹³ The DoD had no opportunity to examine the impacts of seafloor reinforcement work on the dugong in its court-ordered "take into

⁹ See "EDITORIAL: Supreme Court ruling on Henoko project defies common sense," *The Asahi Shimbun*, March 31, 2020.

<http://www.asahi.com/ajw/articles/13259428>. Accessed on May 23, 2020.

¹⁰ Okinawa Defense Bureau (2019). *Futenma hikojoyo daitaishisetsu kensetsu jigyo ni kakaru gijyutsu kentou kai dai ikkai shiryō* [Technical Review Committee for Futenma Replacement Facility Construction: Appendix for the First Meeting].

<https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/Gijyutsukentoukai/kentoukai6/R2no6Shiryō1.pdf>. Accessed May 20, 2020.

¹¹ See "EDITORIAL: Henoko project clearly doomed; time to open talks with U.S." *The Asahi Shimbun*, February 24, 2019.

<http://www.asahi.com/ajw/articles/AJ201902230024.html>. Accessed on May 20, 2020.

¹² According to the U.S. Congressional Research Service in 2016, "Japanese and U.S. officials have said that construction of the FRF would be finished in April 2022 at the earliest. A slightly larger offshore runway project at the Iwakuni Marine Corps base in mainland Japan took 13 years to complete, but the Henoko land reclamation project could proceed faster than the Iwakuni project if Tokyo commits more administrative attention and resources to it." (p.3)

<https://fas.org/sgp/crs/natsec/R42645.pdf>. Accessed on May 20, 2020.

Also, the U.S. Government Accountability Office in 2017 indicates that the completion timeline for the base was 2026 (p.13). See *Marine Corps Asia Pacific Realignment: DoD should Resolve Capability Deficiencies and Infrastructure Risks and Cost Estimates*. (2017).

<https://www.gao.gov/assets/690/683967.pdf>. Accessed on May 20, 2020.

¹³ See "Editorials: Delays and cost overrun at Henoko," *The Japan Times*, December 29, 2019.

<https://www.japantimes.co.jp/opinion/2019/12/29/editorials/delays-cost-overruns-henoko/#.XsRvaNW2wy4>. Accessed on May 19, 2020.

account" process.

Alarmingly but predictably, construction work has been accompanied by disquieting changes in the behavior of the Dugong. According to the Bureau's post-EIA studies, since December 2014, four months after the Bureau set up a large restriction area with buoys and floats and began drilling surveys, no dugong activities have been observed in Oura Bay¹⁴ although in the past, they had been sighted and their feeding trails had been found in Oura Bay (see below). Also, since July 2015, Dugong C, which in the past had been frequently sighted along the coastal areas of northern Okinawa Island, including Oura Bay, has not been sighted anywhere.¹⁵

Since October 2018, one and a half years after the Bureau began seawall construction on the Oura Bay side of the construction site (in April 2017), Dugong A, which till then had been regularly sighted in Kayo and parts of Oura Bay, has not been sighted anywhere in Okinawan waters.¹⁶ Moreover, although "feeding trails have been observed every month off Kayo in the period between June 2009 and December 2013" (The Findings 2014, p.8), since December 2018 no dugong feeding trails have been observed in Kayo.

¹⁴ Okinawa Defense Bureau and Idea Co. (2015). *Schwab (H25) Sui-iki seibutsu to chosa Hokokusho* [Schwab (H25) Aquatic Organisms Surveys: Report]. According to the Report, on May 21, 2014, Dugong C was sighted swimming in the middle of Oura Bay and on November 14, 2014, Dugong A was sighted swimming from the outer Oura Bay to Kayo. These were the last dugong sightings the Okinawa Defense Bureau made in Oura Bay. Unlike other reports by the Bureau, this particular Report has never been available on the Bureau's website. It was obtained via the National Diet member Seiken Akamie. The excerpts from the Report pertaining to dugong activities have been uploaded at <https://sites.google.com/view/okinawadugongreports/home>

¹⁵ Okinawa Defense Bureau (2018). *Heisei 29 nendo Futenma daitai shisetsu kensetsukoji ni kakaru jigochousa houkokusho* [Fiscal Year 29 (2017) Post EIA Survey Report regarding Construction of Futenma Replacement Facility]. <https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/jigochousa29/jich2901.pdf>. Accessed on June 1, 2020.

¹⁶ Okinawa Defense Bureau (2019). *Heisei 30 nendo Futenma daitai shisetsu kensetsukoji ni kakaru jigochousa houkokusho* [Fiscal Year 30 (2018) Post EIA Survey Report regarding Construction of Futenma Replacement Facility]. <https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/jigochousa30/jich3001.pdf> accessed on June 4, 2020.

In March 2019, Dugong B, a female dugong was found dead near Kouri Island on the east coast of northern Okinawa Island, apparently stabbed by a manta ray barb. The water around Kouri Island is considered as the primary habitat of Dugong B, although in the past, Dugong B was sighted along with Dugong C, its calf, in the waters of northern Okinawa Island, including Henoko-Oura Bay.

Responding to this grave situation, in December 2019 the International Union for Conservation of Nature (IUCN) placed the dugong in the waters of Okinawa Island and other Nansei islands as "Critically Endangered" in its Red List of Threatened Species while it recognized the dugong in the Nansei region as a "sub-population."¹⁷ Importantly, the IUCN Red List recognizes:

“One location of major concern is the planned relocation of the current U.S. Marine Corps air base (Futenma), to the central east coast in Oura Bay (Henoko Bay). The new base calls for one seagrass bed to be covered by the new runway and another bed dredged for sand. The new landing field has been under discussion since the late 1990s and in December 2018 construction started by dumping tons of sand into Oura Bay covering acres of coral and seagrass beds.”

“The reclamation area is 160 hectares, a substantial proportion of the total areas of seagrass around Okinawa: the east coast had 21 seagrass beds totaling 539 hectares, and the west coast has nine seagrass beds covering 89 hectares (Uchida 1994; Yoshida and Trono 2004). The loss and damage to these seagrass beds is likely to be a serious impediment to the recovery of the Dugong population in Okinawa.”

¹⁷ Brownell Jr., R.L., Kasuya, T. & Marsh, H. (2019). *Dugong dugon* (Nansei subpopulation). *The IUCN Red List of Threatened Species* 2019: e.T157011948A157011982. <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T157011948A157011982.en>, accessed on May 21, 2020. According to the IUCN Red List the Nansei region refers to a chain of islands that stretches from Amami Oshima Island of Kagoshima prefecture to Okinawa Island and its nearby islands of Okinawa prefecture. While the assessment of the dugong in the Nansei region was made in August 2019, the listing on the Red List was made in December 2019.

Also in December 2019, the Sirenia Specialist Group of IUCN released a “Research Plan.” Although unrelated to the base construction issue, it proposed “multiple approaches to determine if any dugongs remain in Japanese waters because the numbers are so low that any single approach is unlikely to be sufficient” (Sirenia Specialist Groups 2019, p.2).¹⁸

However, the picture is not all dark. In February and March 2020, the sound of dugong calls was detected by the Okinawa Defense Bureau’s underwater recording device K-4 near the construction site in the middle of Oura Bay.¹⁹ This was significant in two respects. First, the calls were detected only in Oura Bay.²⁰ No such calls had been registered by the Bureau’s other monitoring devices in Kayo, Ada, Cape Hedo, and Kouri Island since March 2019.²¹ This fact calls into question the Bureau’s claim of Oura Bay not being important for the dugong in its EIA and the validity of the Findings’ claim of “the extremely low probability of dugongs being present in the APE [Area of Potential Effects]” (see below). Second, most of the detections were made when there were no construction activities.²² This fact demands a critical examination of the

¹⁸ The Research Plan, not linked to the issue of base construction, was an outcome of a Sirenia Specialist Group workshop held in Mie, Japan. The U.S. Marine Mammal Commission provided financial support for the workshop.

See Sirenia Specialist Group (2019). *A Research Plan for the Japanese Dugong Sub-Population prepared by an expert workshop held at Toba Aquarium 24-26th September 2019*. http://locus39.net/Japanese_Dugong/?page_id=25. Accessed on June 04, 2019.

¹⁹ Okinawa Defense Bureau (May, 2020). Data Document 5 used in the 26th Meeting of the Environment Monitoring Committee held on May 15, 2020. https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/kankyokansiiinkai/kankyokansiiinka_i26/R02no26Siryo05.pdf, accessed on May 31, 2020.

²⁰ The Okinawa Defense Bureau uses a peculiar designation system to refer to the two underwater sound recording devices placed in Oura Bay. They are referred to as K-4 and K-5 and are regarded as part of the Kayo sound recording system. K-1, K-2, and K-3 devices are placed off Kayo. K stands for Kayo (Ibid:11)

²¹ The last time the Okinawa Defense Bureau detected dugong calls was on March 14, 2019 in the waters near Kouri Island. The calls were considered as those of Dugong C, which was found dead on March 17, 2019. See Okinawa Defense Bureau (June, 2019). Data Document 5 used in the 20th Meeting of the Environment Monitoring Committee held on June 3, 2019. https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/kankyokansiiinkai/kankyokansiiinka_i20/R01no20Siryo05.pdf, accessed on June 05, 2020.

²² Dugong calls were detected in the middle of Oura Bay on February 11, 23, and 24, and on March 6, 9, 13, 25, and 29. Except for the detections made on March 6 and 25, all the other detections were made when no construction activities took place. See Okinawa Defense Bureau (May, 2020). Data Document 5 used in the 26th Meeting of the Environment Monitoring

relationship between construction work and dugong activities as it points to the inherent weakness in logic of one particular mitigation measure proposed by the Okinawa Defense Bureau in its EIA and accepted by the DoD in the Findings:

When dugongs are observed inside the construction zone, construction activity will cease until the dugongs leave the construction zone. When dugongs are observed to be approaching the construction zone, construction workers will be notified so that all sound-generating activity can be suspended. (The Findings 2014, p.15).

Yet, throughout the last five years of major change in the behavior of the dugong, the Okinawa Defense Bureau has maintained that there is no relationship between base construction and the dugongs' behavioral changes.²³ The Environmental Monitoring Committee, set up by the Bureau as its advisory body to address environmental issues emerging from base construction, has also supported the Bureau's stance. In fact, the dugong expert on the Committee went so far to say that "unless a dugong is dragged or hit by a construction vessel, one could not say with certainty that base construction work has direct impact on the dugong" (Okinawa Defense Bureau 2017, pp.14-15).²⁴ Neither the Bureau nor the Committee has provided explanations for these observed changes, although there have been no other significant activities to which the behavioral changes of the dugong could be attributed.

However, as the Bureau has not been able to sight dugongs and to find any dugong feeding trails in the waters of Okinawa Island since March 2019, members of the

Committee held on May 15, 2020.

https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/kankyokansiiinkai/kankyokansiiinka_i26/R02no26Siryo05.pdf, accessed on May 31, 2020.

²³ See Okinawa Defense Bureau (2014-2020). Minutes and Data Documents used in the Meetings of the Environment Monitoring Committee.

<https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/kankyokansiiinkai/index.html>.

Accessed on June 04, 2020.

²⁴ The dugong expert on the Environment Monitoring Committee made these comments in the 8th meeting of the Committee as other members of the Committee asked for his views on the fact that Dugong C had not been sighted since 2015. See Okinawa Defense Bureau (July, 2017). P.14-15 of the Minutes of the 8th meeting of the community held on July 7, 2017.

https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/kankyokansiiinkai/kankyokansiiinka_i8/H2909Gijiroku.pdf, accessed on June 02, 2020.

Environment Monitoring Committee have expressed concern for the effectiveness of the Bureau's monitoring system and called for improved dugong monitoring.²⁵ And in light of the recent detections of dugong calls in Oura Bay, some members have suggested that the Bureau implement extra dugong monitoring measures in Oura Bay (The Environmental Monitoring Committee 2020a, pp.4-8).²⁶ In particular, the Committee recommended that seagrass beds located five meters below the water surface be monitored for dugong feeding trails in the inner Oura Bay area, which have not hitherto been regularly monitored. As of June 2020, the Okinawa Defense Bureau has added, as an additional mitigation measure, one more observation boat in Oura Bay near the underwater sound recording device K-4.

Throughout the past five years, there have been no official comments from the DoD on the deteriorating situation of the Okinawa dugong except that the DoD has reiterated the Findings' "no adverse effects" conclusions in the course of the Dugong case in the federal courts. It was an ironic (and even comic) moment when, at the court hearing on February 3, 2020, the defense lawyer for the DoD emphatically insisted that the Japanese studies showed "dugong activity on the east coast of Okinawa was mostly concentrated in Kayo, north of Oura Bay, away from the replacement facility (the base construction site),"²⁷ when in fact observable dugong activities had already vanished from the area of Kayo and the waters of Okinawa Island.

The disquieting situation of the Okinawa dugong contradicts the Findings' conclusions and calls for the DoD to examine the relationship between the status of the Okinawa dugong and the construction work. Such examination requires that the DoD critically review the Okinawa Defense Bureau's EIA and its mitigation measures.

²⁵ See Okinawa Defense Bureau (November 2019). The Minutes of the 22nd Meeting of the Environment Monitoring Committee held on November 12, 2019. https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/kankyokansiiinkai/kankyokansiiinka_i22/R1no22Gijiroku.pdf. Accessed on May 26, 2020.

²⁶ See Okinawa Defense Bureau (April 2020). The Minutes of the 25th Meeting of the Environmental Monitoring Committee held on April 10, 2020. https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/kankyokansiiinkai/kankyokansiiinka_i25/R2no25Gijiroku.pdf. Accessed on May 26, 2020.

²⁷ See the Hearing of the Dugong Case at: https://www.ca9.uscourts.gov/media/view_video.php?pk_vid=0000016929. Accessed on May 10, 2020.

No Dugongs in Oura Bay?: Flaws of the Okinawa Defense Bureau’s EIA and the DoD’s Response

The DoD Findings drew its “no adverse effects” conclusion based upon a review of five primary sources.²⁸ Most important of these was the Okinawa Defense Bureau’s Environment Impact Assessment (EIA) and other related studies and the DoD-commissioned *An Anthropological Study of the Significance of the Dugong in Okinawa Culture* (Welch et al. 2010) (hereafter Welch 2010). These served two different but related purposes. The Bureau’s EIA and other related studies examined the impact of the base on the dugong in biological terms, while Welch 2010 examined the impact of the base on the dugong’s cultural significance to the people of Okinawa. Although Welch 2010 is probably the most extensive anthropological study of the Okinawa dugong ever conducted in any language, greater weight was attached to the Bureau’s EIA for the purpose of understanding the impact of the base on the dugong as an biological being. Welch 2010 incorporated the conclusions drawn from the EIA.

However, the Bureau’s EIA has been criticized by many experts and NGOs. The former President of the Japan Society for Impact Assessment, the late Yasuo Shimazu, described it as the worst EIA ever in Japan.²⁹ The most relevant criticism regarding the dugong issues was in fact found in Welch 2010.

The quality of presentation of the information from these surveys in the English translation available to the authors (Okinawa Defense Bureau 2009) was inadequate, and it is unclear if this is result of substandard-quality work done for the EIA or whether it has more to do with the quality of the translation. (p.15)

Little is known of the feeding habits of dugongs in Okinawa and no feeding

²⁸ The Federal Court recognized the following five sources as the bases for the Findings (p.10): *The Welch Report, The Jefferson Report, The Futenma Replacement Facility Bilateral Experts Study Group Report, The SuMMO Final Report, and The Japanese Government’s Environmental Impact Statement/Assessment. Center for Biological Diversity et al. v. Esper*, No. 18-16836 (9th Cir. 2020).

²⁹ Shimazu, Yasuo (2008). “*Futenmahikojo daitaishisetsu mondai no jyunen* [Ten Years of Issues Regarding Futenma Replacement Facility].” <https://www.jriet.net/ases/081206.htm>. Accessed on June 03, 2020.

habits studies on the Okinawan population were conducted as part of the EIA (Okinawa Defense Bureau 2009). (p.16)

Foremost is the need for a program of baseline biological and ecological studies of the dugong. The studies conducted for the EIA (Okinawa Defense Bureau 2009) provide little of value here as there are questions about the experience of observers and the suitability of specific survey methods and the surveys were not used to provide quantitative measures of the populations status. Without such program, it will be difficult to impossible to assess the potential adverse effects of the FRF [Futenma Replacement Facility] and to develop and evaluate appropriate mitigation measures. (p.95)

The discussion of potential impacts and mitigation measures provided in the EIA study (Okinawa Defense Bureau 2009) was found to be only minimally useful as the document did not cite appropriate literature and did not place their recommendations into the context of our current state of knowledge no matter how limited, impact on marine construction and airfield operation on marine mammals. (p.96)

These were harsh words. However, since the DoD had decided not to conduct biological surveys by itself, it had to rely upon the Okinawa Defense Bureau's EIA and other related studies in good faith. Consequently and inevitably, the Findings reached the same conclusions as the Bureau's EIA, that "there will be no adverse effects on the dugong from the construction and operation of the base." The Finding accepted the EIA's two pillars of reasoning: 1) "the extremely low probability of Okinawa dugongs being" in the area of Henoko-Oura Bay (expressions used in the Bureau's EIA) or in the Area of Potential Effects (APE) (expressions used in the Findings) and 2) the Japanese government's commitment to mitigation measures. Of the two pillars of reasoning, the first was most important.

Extremely Low Probability of Dugongs Being Present in the APE

The DoD's claim of "the extremely low probability of Okinawa dugongs being in the APE" is problematic and can be challenged on three grounds. First, the Findings (and

Welch 2010) did not provide a clear and concrete description of what the APE would constitute. There was no graphic illustration of the APE in the Findings. Instead, it presented the following qualitative and tautological descriptions.

The USMC [United State Marine Corps] herein defines the APE for the Undertaking as the geographic area or areas within which FRF construction or operation activities would directly or indirectly affect the Okinawa dugong. Specifically, the USMC defines the APE for the Undertaking as follows: during construction, the APE would include the construction footprint (inclusive of work yards and sea yards) and those portions of Henoko and Oura Bays around the construction site subject to vessel traffic, acoustic disturbance, runoff, or turbidity associated with the construction effort. For operations, the APE would include those portions of Henoko Bay subject to vessel traffic to/from the FRF [Futenma Replacement Facility], acoustic disturbance from FRF operations, and discharge of effluent and storm water runoff from the FRF.” (p.2)

Without detailed or graphic presentation of what constituted the APE, especially those of the “portions of Henoko-Oura Bay,” the Findings failed to establish a logical foundation for further discussion on the impacts of the base on the dugong.

Second, the Findings provided no quantitative descriptions of what was meant by the “extremely low probability of dugongs being in the APE.” The Findings presented some numbers but its discussions remained suspiciously qualitative. The Findings emphasized that sighting of dugongs and findings of dugong feeding trails took place “mostly off Kayo” and were “sporadic” in Henoko and Oura Bay. The Findings did not cite the percentages of dugong sightings and the dugong feeding trails recorded in Oura Bay and off Kayo. (Of course, such discussion is impossible without establishing a clear demarcation of the APE.)

More recently, surveys conducted for the GoJ DEIS (Okinawa Defense Bureau 2009) resulted in 17 sightings of singles and one sighting of a pair between August 2008 [2007] and February 2009 [2008], mostly off Kayo.

From March 2008 to February 2009, there were 57 sightings of single individuals, 27 sightings of pairs, and a single observation of a trio were recorded, again, mostly off Kayo and Kouri Islands. (p.8)

Since June 2009, the GoJ has conducted monthly surveys of the (Henoko and Oura) bays. The graphics in the reports show that feeding trails have been observed every month off Kayo in the period between June 2009 and December 2013. Feeding trails were documented in Oura Bay proper in August 2009 in the area immediately adjacent to the FRF site. Feeding trails were observed directly on the FRF site in June 2009, April 2012, May 2012, June 2012, March 2013, May 2013, and November 2013. An individual dugong was photographed traversing the FRF area in May 2010 (transit; no associated feeding trails). In essence, since June 2009 steady and routine Okinawa dugong activity has been documented off Kayo (north of the FRF), with sporadic dugong activity observed directly in Henoko and Oura bays. (pp.8-9)

Without quantification of what would constitute "extremely low probability," the DoD's "no adverse effects" conclusion cannot be substantiated. This problem becomes more troubling when we consider that "the Oura Bay seagrass beds [were] not routinely surveyed by the Japanese team" for dugong feeding trails from 2007 to 2013 (The Findings 2014, p.8).³⁰ Thus, the Findings' claim of the "sporadic" dugong activities in

³⁰ While the Bureau's EIA surveys for dugong feeding trails focused on seagrass beds located on the footprint of the construction site in Oura Bay, the Bureau did not conduct routine surveys on seagrass beds in other parts of Oura Bay. When the Bureau found 19 feeding trails in the seagrass bed in the inner Oura Bay area in August 2009 (also cited in the Findings, p.8), they were found "by chance" as part of a survey for other marine organisms for the EIA (p.6-16-141). See Okinawa Defense Bureau (2012). *Futenma hikojo daitai shisetsu kensetsu ni kakaru kankyo eikyo hyokasho no hoseigo no kankyo eikyo hyokasho* [Final Environmental Impact Statement]. <https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/hyoukasyohosei/136.pdf>. Accessed on June 6, 2020.

Moreover, the Bureau did not set up passive sonar systems and underwater videos in Oura Bay, although they served as main survey tools in Kayo and Henoko (p. 6-16-22). See Okinawa Defense Bureau (2012). *Futenma hikojo daitai shisetsu kensetsu ni kakaru kankyo eikyo hyokasho no hoseigo no kankyo eikyo hyokasho* [Final Environmental Impact Statement]. <https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/hyoukasyohosei/129.pdf>. Accessed on June 6, 2020.

Oura Bay could have been a function of the lack of routine surveys in Oura Bay by the Okinawa Defense Bureau.³¹

Finally and critically, the DoD failed to pay attention to the fact that the Okinawa Defense Bureau employed a perplexing practice of area categorization in describing dugong sightings in its EIA and other related studies. It referred to dugongs sighted swimming between Oura Bay and Kayo or within Oura Bay as being in the "off Kayo" area in the figures and tables in the EIA and other related studies. The tables and figures in the Bureau's EIA and other related reports do not have an Oura Bay area category.

During a National Diet session on May 24, 2018, the Japanese Ministry of Defense admitted that until February 2017 the Okinawa Defense Bureau had employed the practice of "lumping together dugongs sighted in Oura Bay and sometimes Henoko and categorizing them as being found in "off Kayo."³² The Ministry of Defense has not provided any explanation in response to NGOs' question of why the Bureau used this manipulative practice. And, despite NGOs' repeated requests, the Defense Ministry and the Bureau have not provided any calibrated results of the sightings using an area categorization that distinguishes Oura Bay and "off Kayo."

It is unclear why the DoD failed to recognize and to rectify the Bureau's misleading area categorization. It would be logical to assume, however, that the Bureau's area categorization should have made it difficult for the DoD to draw any graphic illustration of the APE and to present any quantitative discussion of the "extremely low probability of the dugongs being present in the APE." In other words, the deceptive area categorization might have led the DoD to downplay the importance of Oura Bay for the Okinawa dugong and to draw the "no adverse effects" conclusions.

³¹ In fact, the Findings recommended that "GoJ expand its current dugong monitoring program (monthly track line surveys) to include Oura Bay (especially the seagrass beds off the northeast shore of the base and those between the base and Kayo) (p.18).

³² See the exchange between National Diet Councilor Yo-ichi Iha and Mr. Yasunori Nishida of the Ministry of the Environment on p.18 of the Minutes of the Committee on Foreign Affairs and Defense, House of Councilors (Vol. 16, May 24, 2018). <https://kokkai.ndl.go.jp/#/detailPDF?minId=119613950X01620180524&page=18&spkNum=168¤t=-1>. Accessed on May 20, 2020.

The figure (6.16.1.12(1)) below from the Defense Bureau’s EIA (2012) shows a dugong’s movement within Oura Bay while the caption reads “the movement of dugong found in the off Kayo area.”

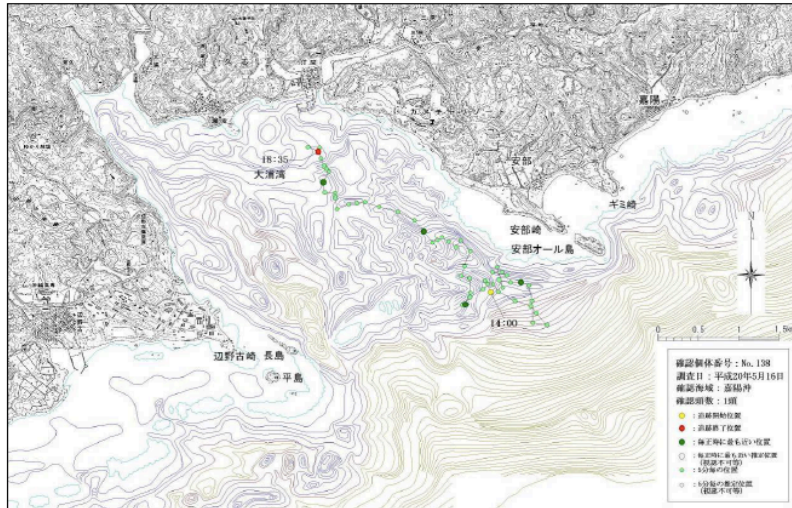


図-6. 16. 1. 13(1) 嘉陽沖で確認された個体の行動軌跡(平成21年5月16日、No.138)

The figure (6.16.1.13(3)) below from the Bureau’s EIA (2012) shows one dugong moving within Oura Bay and another dugong moving off Kayo while the caption reads “the movement of dugong(s) in the off Kayo area.”

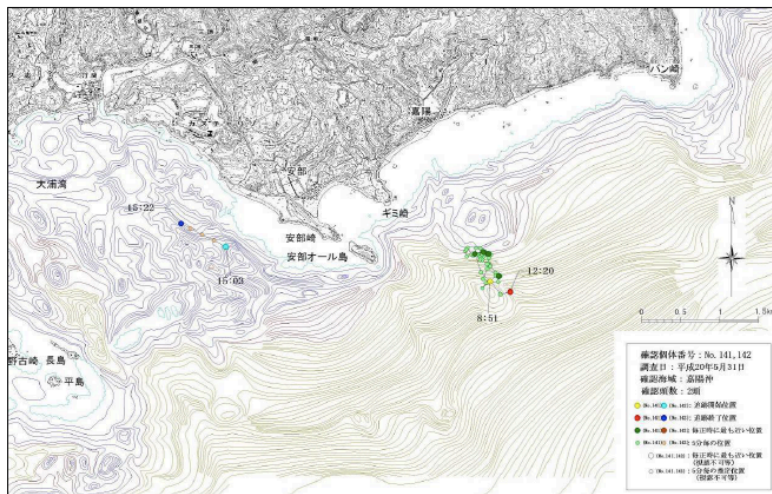


図-6. 16. 1. 13(3) 嘉陽沖で確認された個体の行動軌跡(平成21年5月31日、No.141、142)

The table below presents the sightings of dugongs including the ones discussed above. Like all the tables in the EIA, it does not have an Oura Bay area category although “observation notes” describe dugong movement in more detail within Oura Bay or between Oura Bay and Kayo.

資-6-16-110

調査年	調査月日	追跡海域	追跡頭数	個体番号	成獣・幼獣の別	個体識別	開始時刻-終了時刻 (追跡時間)	観察概要
平成 21年	5月16日	嘉陽沖	1頭	No.138	成獣	個体C	14:00-18:35 (04:35)	ゆっくりと湾口から沖に向かい泳いでいたが、14時30分頃反転し、湾奥に向かった。安部崎の南のリーフに達すると同じ場所 で潜水を繰り返した。15時30分頃から南へ向かい、湾口の瀬の 縁で潜水を繰り返した。16時頃、再び北上し、カヌチャベイ側の リーフに達すると、リーフに沿って北西へゆっくりと泳いだ。 時々、深い潜水を繰り返す行動が見られた。ゆっくりと北西に移動し、 汀間港の水路に達した。
	5月20日	古宇利島沖	1頭	No.139	成獣	個体B	9:19-11:50 (02:31)	屋我地島の東沖(夫振岩の南側)をゆっくりと水面を泳いでいた。 11時頃より西に向かい、その後、水路を北上した。降雨による 視界不良のため、11時50分に追跡を中断した。15時50分頃 から、再び捜索したが、再確認はできなかった。
	5月30日	嘉陽沖	1頭	No.140	成獣	個体A	9:13-18:44 (09:31)	18時頃まで、ギミ崎から安部オール島の沖合を漂ったり、ゆっ くり泳いだりしながら往き来していた。12時から14時頃までは 水面に浮かび、呼吸の時だけ鼻孔を水面に出すという行動が見ら れた。18時頃から嘉陽沖の浅瀬からリーフの入り口方向にゆっ くりと移動した。
	5月31日	嘉陽沖	1頭	No.141	成獣	個体A	8:51-12:20 (03:39)	ギミ崎沖をときおり休息をしながら、ゆっくりと沖岸方向を往 き来していた。11時40分から12時までの間、ウミガメを激しく 追い、抱き付く行動が見られた。
			1頭	No.142	成獣	不明	15:03-15:22 (00:19)	安部崎の西約1.4kmにおいて、大浦湾奥に向かって北西方向に 泳ぐ1頭のジュゴンを確認した。15時20分にヘリコプターに引 き継いだ。直後に見失い、その後、再確認出来なかった。
	6月9日	嘉陽沖	1頭	No.143	成獣	個体A	13:22-18:49 (05:27)	発見時は大浦湾口(安部崎の南約0.9km)でほとんど動かず、 休息を取っていた。13時40分に船が接近し、また、その船が近 くに留まったため、南東方向に泳ぎ、14時頃、北東に転進し、ギ ミ崎沖に移動した。その後、休息をとったり、深く潜水したりし ながら、しだいに嘉陽沖の浅瀬まで移動した。17時頃から、ウミ ガメを激しく追い回し、抱き付く行動が見られ、調査終了時まで 続いていた。
	6月10日	嘉陽沖	1頭	No.144	成獣	個体A	16:00-18:42 (02:42)	ギミ崎の東約2.3kmの位置においてゆっくりとした速度で、水 面近くを西方(ギミ崎方向)に泳いでいた。16時30分頃、休息 を取るが、再び西に移動し、嘉陽沖の浅瀬まで達した。浅瀬を横 断した後、リーフの口に向かった。リーフエッジに達するとリー フエッジに沿って東に移動するが、18時15分頃、再び転進し、 リーフの口に向かった。

注) 個体番号は平成19年度調査 (No.1~19) 及び20年度調査 (No.20~137) からの通算で示しています。

The figure and table below were provided by the Japanese government to the U.S. Department of Defense to assist the DoD to analyze the impacts of the base on the Okinawa Dugong. The figure and table and other related information became publically accessible through the Dugong Case in December 2017.

Dugong Survey Report (June 2009)

1. Dugong Aerial Survey

The survey was conducted over a total of five days, with a wide-area survey conducted on June 9th, 10th, and 17th, and a survey of key ocean areas conducted on June 19th and 20th. The results are shown in Table 1-1 and Fig. 1-1.

Table 1-1: Results of Dugong Aerial Survey (June 2009)

Date of Survey	Scope	Results				
		Area Sighted	Animals	Specimen Photos	Observation Times	Remarks on Observation
6/9	Wide Area	Kayo Waters	1	Specimen A (Photo 1)	13:25-18:40	Swam slowly from mouth of Caura Bay to area off Kayo shore. Drifted off Kayo shore as if resting. Was seen to pursue a sea turtle family.
6/10		Kayo Waters	1	Specimen A (Photo 2)	16:00-18:42	Swam slowly from sea off Kayo toward shore.
6/17		None seen	--	--	--	--
6/19	Key Areas	Kayo Waters	2	Specimen A (Photo 3)	13:51-13:57	Swam slowly from Cape Omi to off Kayo shore. Was seen to pursue a sea turtle family. The sexual organ of Specimen A was confirmed, and it was determined to be male.
				Unknown Specimen (Photo 4)	15:53	After being spotted off Kayo shore, dove deeply and was lost from sight.
6/20	Key Areas	Kayo Waters	2	Specimen A (Photo 5)	08:54-18:03	Swam slowly from Cape Omi to Akabaru Island, then return to Kayo off-shore.
				Specimen C (Photo 6)	14:40-18:40	Swam from Cape Omi to circle Aburatsubo Island, then deep into Caura Bay.

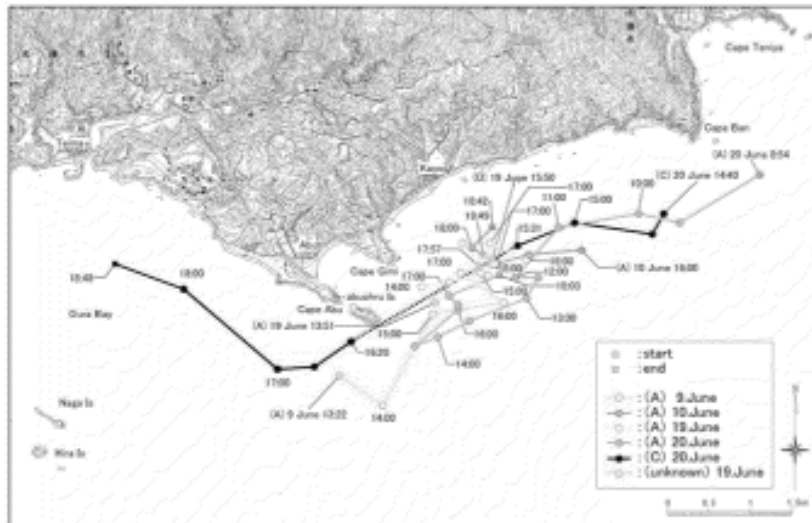


Figure 1-1: Dugong Routes (June 2009) in Ocean Area off Kayo

Re-Reading of Dugong Sightings in Oura Bay and Off Kayo

The DoD, and ultimately the Okinawa dugong, could benefit from a re-reading of the dugong sightings presented in the Okinawa Defense Bureau’s EIA and other related studies if the relationship between Oura Bay and “Off Kayo” is better understood³³ and if the boundary between Oura Bay and Kayo is clearly demarcated. Such re-reading would help evaluate the DoD’s claim of “the extremely low probability of Okinawa dugongs being in the APE.”

To do this, for the sake of consistency, adoption of the demarcation used in the Okinawa Defense Bureau’s EIA surveys for seagrass and weed beds as shown in Figure 6.15.1.51 in the Bureau’s EIA (p.6-15-126) is suggested.³⁴ (It is not clear why the Bureau did not utilize this particular demarcation in discussing dugong sightings in the EIA).

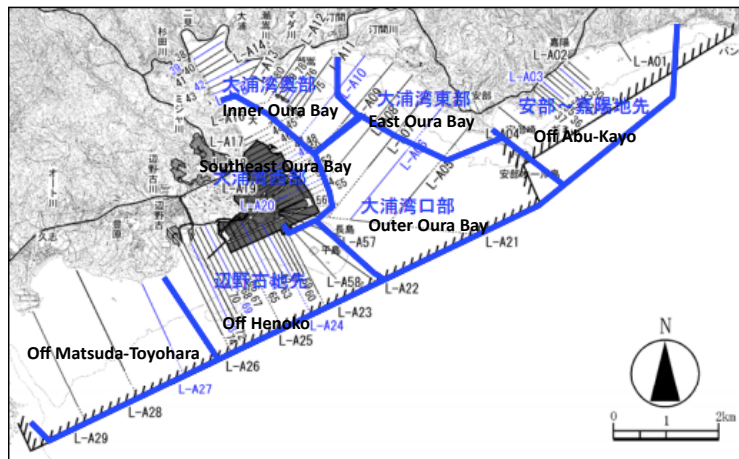


図-6.15.1.51 海域区分とライン調査測線

Figure 6.15.1.51 Marine Areas and Transect Survey Lines

³³ While Oura Bay and Kayo can be seen as a continuous coastal area stretching about 5 miles south-north, it comprises different marine environments. Oura Bay is characterized by underwater geographical and biological diversity, while Kayo is characterized by shallow water with sandy seafloor. While the terms, Oura Bay and Kayo, are often used to distinguish the two areas, there is no clear boundary between them. For discussion of the environment of Oura Bay, see Okinawa Prefectural Government (2018). *Okinawa’s Treasure, the World’s Treasure: Let’s Pass it on to the Future*.

<https://www.pref.okinawa.jp/site/chijiko/henoko/documents/summaryreport.pdf>. Accessed on June 6, 2020.

³⁴ Okinawa Defense Bureau (2012). *Futenma hikojyo daitai shisetsu kensetsu ni kakaru kankyo eikyo hyokasho no hoseigo no kankyo eikyo hyokasho* [Final Environmental Impact Statement]. <https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/hyoukasyohosei/114.pdf>. Accessed June 19, 2020.

A new re-reading of the dugong sightings presented in the Bureau’s EIA and other related studies then becomes as follows.

Of the 16 dugong sightings recorded as being observed in the area category of “off Kayo” between August 2007 to February 2008 (pre-EIA survey studies),³⁵ six sightings (37 percent) involved dugongs moving between Oura Bay and Kayo.

Serial No.	Date	EIA Area Category	Range of Movement	Identification
No. 1	08-27-2007	Off Kayo	From Kayo to Mouth of Oura Bay	A
No. 9	11-13-2007	Off Kayo	From Mouth of Oura Bay to Kayo	A
No. 11	12-11-2007	Off Kayo	From Mouth of Oura Bay to Kayo	A
No. 13	12-16-2007	Off Kayo	From Ginizaki to Mouth of Oura Bay	A
No. 17	02-05-2008	Off Kayo	From Mouth of Oura Bay to Abu Oul Island	A
No. 18	02-08-2008	Off Kayo	From Kayo to Mouth of Oura Bay to Kayo	A

Of the 54 dugong sightings recorded as being observed in the area category of “off Kayo” between March 2008 to February 2009 (the EIA),³⁶ 17 sightings (31 percent) involved dugongs moving between Oura Bay and Kayo or within Oura Bay.

³⁵ These sightings correspond to the Findings statement “More recently, surveys conducted for the GoJ DEIS [Draft Environmental Impact Statement] (Okinawa Defense Bureau 2009) resulted in 17 sightings of singles and one of a pair between August 2008 [2007] and February 2009 [2008], mostly off Kayo.” (p.8).

³⁶ These sightings correspond to the Findings statement “From March 2008 to February 2009, 57 sightings of single individuals, 27 sightings of pairs, and a single observation of a trio were recorded, again, mostly off Kayo and Kouri Islands. (p.8).

Serial No.	Date	EIA Area Category	Range of Movement	Identification
No. 20	03-17-2008	Off Kayo	From Panzaki to Mouth of Oura Bay to Kayo	A
No. 21	03-21-2008	Off Kayo	From Panzaki to Mouth of Oura Bay to Kayo	A
No. 25	03-26-2008	Off Kayo	From Off Oul jima to Kayo	A
No. 29	04-01-2008	Off Kayo	From Mouth of Oura Bay to Kayo	A
No. 45	05-24-2008	Off Kayo	From Panzaki to Kayo to [Mouth of] Oura Bay	A
No. 58	06-17-2008	Off Kayo	From Kayo to [off]Mouth of Oura Bay to Kayo	A
No. 74	08-07-2008	Off Kayo	From Mouth of Oura Bay to Oul jima to Kayo	A
No. 82	09-10-2008	Off Kayo	From the center of Oura Bay towards east of the bay	A
No. 84	09-20-2008	Off Kayo	From Panzaki to Kayo to Oura Bay	? (C?)
No. 85	09-20-2008	Off Kayo	From Mouth of Oura Bay to Kayo	C
No. 88	09-23-2008	Off Kayo	From Kayo to Mouth of Oura Bay to Kayo	A
No. 90	09-24-2008	Off Kayo	From Teniyazaki to Kayo to the Center of Oura Bay	A
No. 96	10-24-2008	Off Kayo	From Oul jima to Gimizaki Δ	C
No. 100	10-21-2008	Off Kayo	From along Oul jima to off Oul Jima Δ	A
No. 104	11-04-2008	Off Kayo	From Kayo to Oul jima to Kayo Δ	A
No. 123	01-16-2009	Off Kayo	From Abuzaki to Mouth of Oura Bay to Kayo	A
No. 130	02-05-2009	Off Kayo	From Off Gimizaki to Mouth of Oura Bay to Kayo	A

Of the 35 dugong sightings recorded as being observed in the area category of “off Kayo” between May 2009 and January 2011 (Supplementary EIA studies), nine sightings (25 percent) involved dugong moving between Oura Bay and Kayo or within Oura Bay.

Serial No.	Date	EIA Area Category	Range of Movement	Identification
No. 138	05-16-2009	Off Kayo	Mouth of Oura Bay to inner part of Oura Bay	C
No. 142	05-31-2009	Off Kayo	Oura Bay	?
No. 143	06-09-2009	Off Kayo	From off Oul jima to Kayo Δ	A
No. 148	06-20-2009	Off Kayo	From Panzaki to Kayo to the center of Oura Bay	?
No. 163	05-25-2010	Off Kayo	From Gimizaki to Off Abuzaki and Oul jima Δ	A
No. 169	09-21-2010	Off Kayo	From Oul jima to center of Oura Bay	A
No. 174	11-08-2010	Off Kayo	From Abuzaki (mouth of Oura Bay) to Kayo	A
No. 177	01-13-2011	Off Kayo	From Abuzaki (mouth of Oura Bay) to Kayo	C
No. 180	01-18-2011	Off Kayo	From mouth of Oura Bay to Abuzaki to Kayo	A

Of the 13 dugong sightings recorded as being observed in the area category of “Kayo Waters” between May 2013 and November 2013 (post-EIA studies), six (41 percent) involved dugong moving between Oura Bay and Kayo or within Oura Bay.

Serial No.	Date	EIA Area Category	Range of Movement	Identification
No. 222	05-20-2013	Off Kayo	From Teniyazaki to Oura Bay	C
No. 223	05-27-2013	Off Kayo	From Kayo to Abuzaki (mouth of Oura Bay)	A
No. 227	09-11-2013	Off Kayo	From Kayo to Oul jima Δ	A
No. 228	09-12-2013	Off Kayo	From Abuzaki (mouth of Oura Bay) to Oura Bay to Kayo	A
No. 230	11-12-2013	Off Kayo	Oura Bay	C
No. 236	11-15-2013	Off Kayo	From Kayo to Abuzaki (mouth of Oura Bay)	A

In total, of the 118 dugong sightings recorded as taking place in the area of “off Kayo” or “Kayo Waters” in the Bureau’s EIA and other related studies between August 2007 and November 2013, 38 sightings (32 percent) involved dugongs moving between Oura Bay and Kayo or within Oura Bay. These numbers should not be interpreted as “the extremely low probability of dugong being present in the APE”; but regarded as indicators of the importance of Oura Bay for the Okinawa dugong. They demand a careful examination of the significance of Oura Bay for the dugong in the context of the construction and operation of the base.

No Monitoring of Construction Noise?

As evident in the Findings and Welch 2010, the DoD empathized the necessity of implementing effective mitigation measures even though it accepted the premise of “the extremely low probability of dugongs being present in the APE.” In careful language, Welch 2010 described the intricate relationship between monitoring and conservation efforts and the possible impacts of the base on the dugong as follows:

There is reason to believe that the construction of the Futenma Replacement Facility can proceed without having an overall adverse impact on the endangered population of dugongs in Okinawa, but this will require a well-planned approach that involves cultural sensitivity, adaptive management and state-of-the-art biological monitoring and cooperation with the Japanese and Okinawan governments (p.97)

Most importantly, pre-construction, construction and post-construction phase dugong and seagrass monitoring programs should be undertaken to evaluate actual impacts the effectiveness of mitigation measures and to provide

information for use in adaptive management of the dugong population. (p.97)

While concurring with Welch 2010, the Findings placed exceptional importance on the monitoring of construction noise as a mitigation measure.

(S)hould dugongs, in fact, be present in the APE, the construction and operational activity is primarily of the type that would not have an adverse effect. The exception to this, as discussed in Section 3.2.4, is construction noise; however, the GoJ has committed to noise minimization and monitoring efforts that the USMC finds likely to be effective in avoiding or minimizing impacts on dugongs if they are present during construction. (p.12)

Indeed, the Okinawa Defense Bureau's EIA identified two sources of underwater construction noise that could affect the dugongs if they would be present in the construction site and its vicinity: sound from construction work (pile driving and rubble mound construction) and sound from construction vessels (Okinawa Defense Bureau 2012, 6-16-227).³⁷ The Bureau's EIA made assessments and the DoD accepted them. The Findings states:

“The GoJ FEIS [Final Environmental Impact Statement] (Okinawa Defense Bureau 2012) included an analysis of the noise levels and sound pressure levels likely to be produced during different construction activities, such as pile-driving. The USMC reviewed this analysis and concurs with GoJ's conclusions. Specifically, in the water areas from Abu to the west of Kayo Bay, the impact of underwater sound is not expected to cause physical damage to dugongs, should they be present while construction noise occurs. Similarly, although sound pressure levels during stage 1 of construction could impact on the dugong behavior (if dugongs are present), cumulative sound exposure is not expected to significantly affect dugong behavior in this area. In Oura Bay, underwater sound is not expected to cause physical damage to dugongs (if

³⁷ Okinawa Defense Bureau (2012). *Futenma hikojo daitai shisetsu kensetsu ni kakaru kankyo eikyo hyokasho no hoseigo no kankyo eikyo hyokasho* [Final Environmental Impact Statement]. <https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/hyoukasyohosei/139.pdf>. Accessed on June 15, 2020.

present during construction), but could cause impacts to dugong behavior during all three phases of construction.”(p.14)

Despite this shared recognition of the possible impact of construction noise on the dugong and the DoD’s understanding of the necessity of monitoring of construction noise, the Okinawa Defense Bureau has forgone the monitoring of construction noise for the dugong for the last six years since the start of construction work. The Ministry of Defense has recently explained that, according to the Bureau’s FEIS, construction noise for the dugong refers to noise which is associated with “pile driving”; since there has been no “pile driving” work so far, there has been no monitoring of construction noise.³⁸ (It is not clear, from the reading of the Findings, whether the DoD’s understanding of “construction noise” is as narrow as that of the Okinawa Defense Bureau’s). Thus, there is no data that would enable any expert to examine the relationship between construction noise and the changes in the behaviors of the three dugongs. Also, there is no public record showing that the Environmental Monitoring Committee has ever raised the issue of lack of monitoring of construction noise in their meetings.³⁹

In fact, despite NGOs’ repeated inquiries, the Ministry of Defense has not provided for the last couple years any answers to the questions of whether the Okinawa Defense Bureau has conducted monitoring of construction noise for the dugong and of why there is no publicly available data regarding construction noise. Instead, the Ministry has kept reiterating that the Bureau has been monitoring dugong calls using passive sonar monitoring devices. However, the monitoring of dugong calls cannot be considered equivalent to, or substituting for, the monitoring of construction noise.

On a regular day of construction since the start of seawall construction in April 2017, some 40 ships and boats, many engaging in land reclamation work, other guarding the construction site, and still others monitoring dugongs, are present in Henoko-Oura Bay.

³⁸ Ministry of Defense (2020). Correspondence Document (dated June 18, 2020) submitted to National Diet Councilor Yo-ichi Iha.

³⁹ See Okinawa Defense Bureau (2014~2020). The Minutes of the Meetings (1st~26th) of the Environmental Monitoring Committee.
<https://www.mod.go.jp/rdb/okinawa/07oshirase/chotatsu/kankyokansiiinkai/index.html>.
Accessed on June 6, 2020.

Drilling surveys, seawall construction, and landfilling take place simultaneously. Large ships sail along the coast of northern Okinawa Island, including the area of “off Kayo,” transporting sand and rocks from Awa and Motobu on the west coast of Okinawa Island to Henoko-Oura Bay. A five-mile-long chain of floats and buoys, demarking the “temporary restriction zone” for construction work, are anchored to more than 250 concrete blocks sunken to the bottom of the sea as deep as 130 feet with heavy metal chains. These construction activities and equipment all make noise underwater, and they should require careful monitoring not only for the dugong but also for other marine creatures sensitive to anthropogenic sound, including turtles and possibly dolphins.⁴⁰

The lack of monitoring of construction noise over the six years is extremely disturbing. It apparently goes against the DoD’s understanding that “the GoJ has committed to noise minimization and monitoring efforts that the USMC finds likely to be effective in avoiding or minimizing impacts on dugongs if they are present during construction.” (The Findings 2014:p.12). It is not difficult to assume that the absence of monitoring of construction noise could have contributed to the dire situation of the Okinawa dugong population.

It is understandable that, at the time of the issuance of the Findings in April 2014, the DoD was not in a position to know in detail what the Okinawa Defense Bureau’s monitoring efforts would constitute or to foresee that the Bureau would forgo monitoring of construction noise for the next six years. After all, the DoD accepted the Bureau’s EIA in good faith assuming that the mitigation measures proposed in the Bureau’s EIA were scientifically sound and would be implemented as they would have been in the U.S.

It is still troubling, however, that the DoD appears to have been unaware of the absence of monitoring of construction noise for the dugong. This situation calls into question the DoD’s commitment to the conservation of the Okinawa dugong (in relation to base construction). In a broader context, it calls into question the effectiveness of Section 402

⁴⁰ See Jefferson T.A., Au W., Lammers, M., and Richie, M. (2013). *Survey of the Marine Mammals of Okinawa (SuMMO) Project*. Submitted to Naval Facilities Engineering Command NAVFAC Pacific, Honolulu, Hawaii, under Contract No. N62470-10-D-3011 CTO KB13 issued to HDR Inc., San Diego, California.

of the National Historical Preservation Act (NHPA), if it only requires U.S. federal agencies to take into account the effects of its Undertakings before their commencement but not after.

Concluding Notes: For the Future of the Okinawa Dugong and the DoD's Conservation Efforts

Ten years ago, as part of the DoD's "take into account process" ordered by the U.S. Federal District Court in San Francisco under Section 402 of the NHPA, Welch 2010 reviewed the Okinawa Defense Bureau's Draft EIA (2009) and made it clear:

"Further studies will be needed both to clarify the current biological status of the Okinawan dugong population and to develop and refine an appropriate set of mitigation measures to ensure the construction and operation of the FRF will not have significant negative impact on the population. Detailed biological assessment which would include specific plan for biological monitoring of the population throughout the different phases on construction and operation is necessary next step" (p.97).

Over the last ten years, environmental NGOs, experts, and citizens in Okinawa, Japan, and beyond them have made similar pleas and demands as those in Welch 2010 to the Okinawa Defense Bureau and the Japanese government in the form of public comments in the EIA process, formal petitions, lobbying, and public rallies. Some NGOs and citizens have made similar pleas and demands to the DoD through the U.S. legal systems. And since the mid-2010s, the Okinawa Prefectural Government has joined these efforts: Okinawa Governors, the late Takeshi Onaga and current Governor Denny Tamaki have visited Washington D.C. presenting their cases to the DoD and Congress members and have sent letters to the DoD requesting a review of the DoD's Findings and a consultation with the DoD.⁴¹

⁴¹ See Onaga, Takeshi (2018). "Request for Consultation Regarding Okinawa Dugongs under the U.S. Historic Preservation Act." <https://www.pref.okinawa.jp/site/chijiko/henoko/documents/requestsd.pdf>. Accessed on June 6, 2020.

See also Tamaki, Denny (2020). "Request Letter Regarding the Protection of the Okinawa Dugong." <https://www.pref.okinawa.lg.jp/site/chijiko/henoko/documents/request.pdf>. Accessed on June 6, 2020.

These organizations, citizens, and the Prefectural Government have all been convinced that honest scientific studies will show the base as likely to have tremendous adverse effects on the Okinawan dugong, the endangered creature with cultural and historical significance to the people of Okinawa and thus that the area of Henoko-Oura Bay is not a proper place for base construction.

However, over the last decade the Okinawa Defense Bureau has shown continuing disregard for such plea, a readiness to defy scientific principles and an absence of sense of responsibility for the protection of the Okinawa dugong, Japan's Natural Monument. The Bureau has undermined and compromised the DoD's efforts to comply with U.S. laws and regulations pertaining to the conservation of the Okinawa dugong and the U.S. Court's efforts to hold the NHPA effective and relevant. The undeniable fact is that the Okinawa dugong has become "Critically Endangered." The IUCN's Red List speaks the truth.

This situation needs to be rectified. The relationship between the dire status of the dugong and construction work and the importance of Oura Bay for the dugong needs urgent review. Such review is imperative, especially in light of the detection of dugong calls in the middle of Our Bay and the Japanese government's admission that construction will take at least 12 more years. What is at stake is not only the Okinawa dugong but also the integrity of the DoD and other U.S. federal systems.