

The Canadian Field-Naturalist

SUPPLEMENTARY MATERIAL:

Epimeletic behaviour in a Southern Resident Killer Whale (*Orcinus orca*)

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APPENDIX S1. Field observations of J35, 24 July to 11 August 2018, and October 2020 update.

24 July, day 1—In the morning, members of the Southern Resident Killer Whale (SRKW; *Orcinus orca*) population were observed heading northeast from Race Rocks, British Columbia (48°18'01.4"N, 123°32'01.5"W). A research associate with the Center for Whale Research and Cascadia Research Collective reported the possibility of a new calf in J pod, belonging to female J35. Researchers from the Center for Whale Research deployed and found J35 travelling with J47 near Discovery Island, British Columbia. After observing a few surfacings, they determined that J35 was carrying a deceased neonate assumed to have been born earlier that day. J35 continued to carry her calf throughout the day as the pod continued to travel toward San Juan Island (see Figure 1 in the main publication).

25 July, day 2—J35 was seen from shore near the Lime Kiln Lighthouse on San Juan Island (48°30'56.8"N, 123°09'09.7"W) travelling north, still carrying her deceased calf. She was not alone, but was flanked by family members J46 and J40. The group was noted by the Whale Museum staff observers on the shore at Lime Kiln Lighthouse as stopping its forward momentum and turning to wait for J35 to pick up the dead calf before continuing. As the afternoon progressed, J pod entered Boundary Pass (48°43'52.5"N, 123°08'05.0"W) and began moving northeast with Soundwatch monitoring as J35 started to fall behind the rest of her family group. Her breathing was noticeably laboured in that her exhales were loud and abrupt and her inhales were drawn out. As J35 would surface with her calf on her rostrum, the calf would slide to one side and fall off. J35 would pause a moment to take a deep breath before diving to retrieve the calf. This suggested that the calf was negatively buoyant and probably difficult to carry.

26–27 July, days 3 and 4—J35 was observed still carrying her calf, but it was noted that she had begun to switch between carrying the calf on her rostrum and holding it in her mouth, making it very difficult to see the calf (see Figure 2 in the main publication). It was clear to observers that this was a burden to her,

as she was often seen falling behind her pod and her breathing was laboured. J35 would surface five or six times within a minute, then take a longer and assumed deeper dive, and surface far ahead of where one would expect. Toward the end of the afternoon as the pod approached San Juan Island, J35 was left behind again, to travel at the back of the pod. At this point, she began a rhythm of surfacing without the calf on her rostrum and pausing at the surface for a few seconds before taking a deep breath and then diving to retrieve the calf. It was noted that J35 sometimes carried the calf by its pectoral fin in her mouth. In this way, the calf fell to one side in-line with J35's body, perhaps making it easier for J35 to carry.

28 July, day 5—J35 and her family were located in Swanson channel (48°45'45.4"N, 123°20'10.7"W), then up through Active Pass (48°51'31.8"N, 123°18'57.9"W). In the Strait of Georgia, very few boats were around. J35 began pushing her calf in front of her, more so than actually carrying it on top of her rostrum. This might have been evidence that the calf was continuing to be negatively buoyant, and therefore sinking. J35's dives were slightly longer than those of her family group, and her breathing was considered louder and more laboured during this time.

29 July, day 6—J35 and her family were documented near the mouth of the Fraser River in the Strait of Georgia, British Columbia (49°05'23.8"N, 123°11'28.5"W). It was confirmed at 1045 that J35 was still carrying her calf. Later that day the group was seen in Boundary Pass with J35 still carrying her calf.

30 July, day 7—Early in the morning, reports come in of J pod up near the Sand Heads Lighthouse off the Fraser River (49°06'20.3"N, 123°18'12.9"W). As Soundwatch arrived, the whale watch vessels on scene directed us toward J35 who was alone trailing behind the pod. She was in her rhythm of taking a few short breaths, then a deep breath and long dive, continuing to push her calf along.

31 July, day 8—J pod was seen on the west side of San Juan Island (48°29'08.3"N, 123°06'20.9"W) with the whales spread out into small groups. The J16, J17,

and L12 subgroups were travelling near each other. J35 fell behind the group and was travelling by herself. She still surfaced differently than all the other whales and did not rise out of the water as much as she typically did. This was because she was now carrying the calf in her mouth most of the time, rather than on her head. The calf's body had started to lose its rigid form and decrease in size. It became clear that the body had started to decompose.

1 August, day 9—Researchers from both the Cetacean Health and Life History Program at the National Oceanographic and Atmospheric Association and SeaLife Response, Rehabilitation, and Research were the first to come across J pod and the L12s near Point Roberts (48°58'14.6"N, 123°05'02.2"W). When Soundwatch arrived on scene, the whales were widely spread out in small groups. We slowly moved our way through the groups of whales trying to identify J35. We continued our search as the whales began to group up. Once the pod had come together, the J17s had still not been sighted. In coordination with other researchers, Soundwatch decided to backtrack to see whether the J17s were trailing behind. Just as we were about to give up, we saw a group of whales porpoising in the direction of the rest of the pod. It was the J17s, with J35 right in the middle surrounded by her family. We were all impressed with how fast she was travelling and began to wonder if she still had the calf with her. We thought we saw it a few times and, after consulting with the Center for Whale Research, we were able to confirm that they had clearly seen the calf still being held in J35's mouth.

2–8 August, days 10 through 16—On 2 August, J pod and the L12s were seen heading west in the Strait of Juan de Fuca. The presence of J35 and her calf was confirmed by whale watchers, but the whales were out of range for Soundwatch, and they were heading west and probably would not be back in range for at least a few days. Usually when the whales head west in the summer, they go out to the mouth of the Strait of Juan

de Fuca to forage for salmon returning to the inland waters of Washington from the outer coast. Fisheries and Oceans Canada reported seeing J pod, with J35, a few times on the southwest coast of Vancouver Island, near Port Renfrew (48°32'04.1"N, 124°28'54.6"W), and, on 8 August, J pod was seen heading east back into inland waters toward the San Juan Islands.

9 August, day 17—The whales were seen heading northeast from Race Rocks in British Columbia (48°18'01.4"N 123°32'01.5"W) toward San Juan Island. Other researchers on scene had confirmed the presence of J35 still carrying her calf. The calf had decomposed to a significant level. The calf's body had lost all of its form and had opened on the ventral side, exposing the inner organs. The afternoon of 9 August around 1400 was the last time Soundwatch saw J35 carrying her calf in the Haro Strait (48°33'25.1"N, 123°10'38.1"W). Whale watch vessels in the area later in the day reported that J35 was travelling with her family without her calf, and she was behaving "normally". Soundwatch and the research community focussed on continuing to monitor J35's behaviour, especially to see whether she was eating, as she likely had not been feeding normally for the 17 days while she carried her calf.

11 August, day 19—J pod was back on the west side of San Juan Island (48°29'08.3"N, 123°06'20.9"W) and J35 was observed foraging with her family and other members of her pod with no evidence of her deceased calf.

Update, October 2020—At the time of writing, J35 had successfully given birth to another calf, J57, a male. The calf had successfully survived at least a month and all indications were that it was healthy. In late September, another calf, J58, had been borne by J41, but the sex of this calf is unknown at this time. With the births of these calves, there are now 24 members of J pod and 74 individuals in the SRKW population. In addition, J35's niece, J46, was identified as pregnant in mid-October.