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Southern Right Whale Sightings and Two Incidences of Interaction with Peale's Dolphins in Los Ríos Region, Southern Chile

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According to the International Union for the Conservation of Nature, the Southeastern Pacific (SEP) subpopulation of southern right whales (*Eubalaena australis*, Desmoulins, 1822; SRWs) is critically endangered with ≤ 50 mature individuals left (Cooke, 2018). Most of the ~4.5 annual sightings in Chile concentrate between 18° and 25° S, and near 33° S (Aguayo-Lobo et al., 2008; also see Thiel et al., 2007; Pavés et al., 2020). South of 40° S, the coastal waters of Isla Chiloé, Los Lagos Region (see Figure 1), seem to be important for the subpopulation, possibly including habitat for reproductive behavior (Galletti Vernazzani et al., 2014). Data from the northwardly adjacent Los Ríos Region (near 40° S; see Figure 1) are scarce (Aguayo-Lobo et al., 2008; Galletti Vernazzani et al., 2014). Anecdotal reports are therefore of scientific and conservation value. This paper comprises detailed behavioral observations meant to enhance the understanding of, and to encourage further research on, SEP SRW social and ecological functioning and needs. It also covers SRW behavior not yet reported for this subpopulation, and it represents the first documentation of interspecific interaction between SRWs and Peale's dolphins (*Lagenorhynchus australis*, Peale, 1848; PDs) in the SEP.

The sightings took place in Bahía Chaihuín (39° 56' S, 73° 35' W), Comuna de Corral, southern Los Ríos Region (see Figure 1). Bahía Chaihuín is unique compared to most of Los Ríos Region's coastline. It roughly measures 3 km^2, and it is sheltered from strong currents and winds by its northern-directed opening. The bay's northern and southern shores are steep and rocky, but along the bay's rather shallow east end is a wide beach, and sandy dunes form a barrier to the broad estuary of Río Chaihuín. The river's only narrow opening lies in the bay's northeastern corner. I lived in Chaihuín from mid-2013 to mid-2015 to study PDs. This also enabled anecdotal documentation of rarer species and events. During these opportunistic sightings, notes were taken, and photographs and/or videos were collected with a Canon PowerShot SX130 IS. When necessary, binoculars (Nikon 7×50 mm) were used. All sightings were made from land under good to excellent weather and sea conditions (BSS ≤ 3). SRWs were mainly identified through V-shaped blows, lack of a dorsal fin, form of head/mouth, and presence of callosities on the head. PDs were identified through size, shape, and coloration (e.g., Goodall et al., 1997). Distances, heights, and SRW lengths are rough estimates.

Over the 2-y-period, I witnessed a SRW in Bahía Chaihuín on three occasions: (1) 23 June 2013, (2) 26 October 2013, and (3) 22 July 2014. Sighting durations were 40, 75, and 68 min, respectively, although the SRW of sighting 2 may have stayed in the bay longer. The sightings from austral winter (sightings 1 & 3) involved interactions with PDs.

Sighting 1

On 23 June 2013 at 1503 h, I spotted from the beach a 9 to 15 m long SRW at 250 m, close to the northern shore. Also, ~20 PDs were within the bay. All but four to six PDs were surface active and headed in the direction of the SRW. An additional ~10 PDs arrived in the bay, after which ~25 PDs immediately engaged in pronounced aerial behavior—mostly vertical leaps with lateral reentries—which was perceived as noisy. During the entire sighting, all PDs remained at ≥ 100 m from the mysticete; the SRW moved steadily from north to south along the beach at 250 m. At 1515 h, ~20 PDs dispersed again along the beach, engaged in calmer activity. I last saw the SRW at 1543 h in the southwestern part of the bay. While crossing the bay, the SRW showed a regular respiration pattern: there was a sequence of three breaths within ≤ 1 min every 10 min.

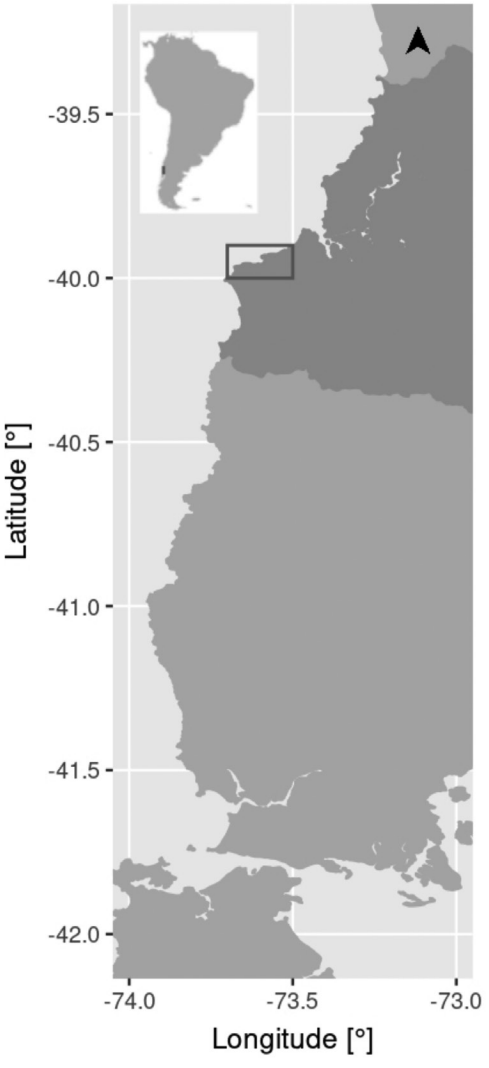

Figure 1. Section of the southern Chilean coast. Los Ríos Region (dark gray) is located north of Los Lagos Region (lighter gray in the south, including the northern portion of Isla Chiloé). The dark gray rectangle in Los Ríos Region highlights Bahía Chaihuín, with Punta Chaihuín as a distinct northwestern landmark. The map was built with *R*, using package 'chilemapas' as its basis.

Sighting 2

On 25 and 26 October 2013, several local citizens independently reported to me at least one SRW in Comuna de Corral. One SRW allegedly moved northeast into Bahía Chaihuín and remained close to the opening of Río Chaihuín. The SRW's behavior was described as "calm, sometimes rolling on the back, showing pectoral fins, thorax, and abdomen." No other cetaceans were mentioned. At 1155 h on 26 October, I started my own observations from a 14-m high location on the bay's northern shore. I saw a ~14-m-long SRW (later with reservations sexed as male) dive in intervals of ≤ 1 min in the northeastern part of the bay. The dives were performed in a horizontal body position, with occasional brief horizontal exposures of the fluke at the surface. The SRW with the fluke may have been engaged with a long, lead-colored object, but visibility precluded confirmation. Balaenids elsewhere have been documented to physically interact, or play, with objects (Würsig et al., 1989; Würsig, 2009).

At 1158 h, this SRW suddenly turned towards the bay's northwestern shore, traveling at ~10 km/h. Increasing speed (to ~15 km/h), the SRW then swam very close to the surface, above, in between, and/or through fishing nets mounted over ~250 m^2 near the northern shore, to the northwestern edge of the bay (i.e., Punta Chaihuín; Figure 1). Fishing gear imposes a potential entanglement threat (e.g., Cooke, 2018; Cooke & Zerbini, 2018). It is unclear whether the SRW crossed the nets intentionally or unintentionally, but both the SRW and the nets remained seemingly unharmed. I followed the SRW to Punta Chaihuín and continued my observations from a ~20-m-high vantage point at 1220 h. The SRW stayed mostly at 50 to 100 m from shore, slightly south of Punta Chaihuín, exhibiting a diverse spectrum of surface and aerial behaviors. Breathing was performed in ventral or vertical (entire head lifted, mouth closed) positions. After a lobtail-initiated submersion of ~5 min, the SRW started a series of breaches (up to two thirds of the body lifted above surface). Reentries were lateral, dorsal, or between the two, yielding foam and loud splashes. Breaching intervals ranged from < 5 s to 1 min, interrupted by respirations or short dives initiated by brief lobtails. The last breach was performed at > 100 m from shore at 1239 h. At 1241 h, the SRW, again between 50 and 100 m from shore, started a sequence of aerial fluke/peduncle behaviors. For ~1 min and in intervals of roughly 15 s, the SRW's posterior body was lifted several times up to 5 m above the surface (see Figure 2). The mostly ventral but also dorsal fluke reentries often produced foam and loud splashes. Note that, because of the height and back-slapping intensity of these lifts, the term "lobtail" is avoided. After this regular pattern, this fluke behavior was combined with different longitudinal body rotations right below the surface, interrupted by short sequences of respiration. As a consequence of this rolling/rotation, many fluke elevations were not vertical but more lateral, and the action was less noisy. Episodes, separated by 30 to 90 s, comprised three to five

Figure 2. Upright tail lifting (sailing) within a series of fluke/peduncle aerial behaviors by the southern right whale on 26 October 2013 (sighting 2) (*Photo credit:* Víctor Andrés Palma Aravena, used with permission)

fluke lifts separated by 6 to 12 s. Respiration was mostly audible onshore. During one sequence, also involving fluke aerial behavior, a breath was immediately followed by a very loud and deep bellowing call (~2 s); it was clearly audible, perceived by myself and a volunteer. Assuming this sound was emitted by the SRW, it may have been an up call/upsweep call (Clark, 1982; Jacobs et al., 2019). Once, two PDs traveled fast and straight southeast into the bay, at a distance of > 50 m to this SRW. No interactions between, or reactions by, the species were apparent. At 1253 h, the SRW started traveling southwest, remaining submerged for 7 min. The SRW repeated the fluke lift behavior at 200 m offshore with respiration intervals of 4 to 60 s. The SRW continued the southwest heading. I stopped observations at 1310 h.

Sighting 3

At 1652 h on 22 July 2014, from the bay's northern shore, I spotted a SRW only ~9 m long, possibly an immature/subadult (e.g., Tormosov et al., 1998). There were ~15 highly active PDs in the same (northeastern) section of the bay performing different leaps, among other behaviors. A direct interaction between both species lasted ~10 min. The odontocetes moved around the SRW, also at distances ≤ 1 PD's length, occasionally even over the whale. After two blows, the SRW's head remained at the surface for several seconds before breathing (Supplemental Video sequence 1; the supplementary video footage for this paper is available in the "Supplemental Material" section of the *Aquatic Mammals* website: https://www.aquaticmammalsjournal.org/index.php?option=com_content&view=article&id=10&Itemid=147). Next, the SRW lifted the fluke a few centimeters above the surface, let the fluke submerge, and assumed a horizontal position, followed by bubbles visible at the surface. While the SRW was underwater, the PDs swam, humped fast, and plowed (i.e., a distinct variation of a fast ventral surface swim producing a bow wave and whitewater; Niebaum, 2022) over very short distances, mostly in tight subgroups; they changed directions quickly. This activity continued for another 3 min, although with less intensity. At 1704 h, the SRW headed slightly south, and I clearly perceived a strong, deep sound, ~1 s long and different from the one in sighting 2. Assuming this sound was from the SRW, it rather resembled a "slap" (Clark, 1982). Within seconds, all PDs hurried > 1 km away to the bay's southeast. The SRW remained in proximity to the narrow opening of Río Chaihuín, right behind the surf zone, breathing every 1 to 5 min in a ventral position. Pectoral fins above the water surface indicated lateral and dorsal body positions. About 40 min into this observation, the SRW became more active (see Supplemental Video sequence 2). This behavior

continued until 1800 h. The SRW then submerged with an arched body, slightly elevated the fluke above surface once, produced bubbles, and left the bay heading northwest.

Both winter sightings, 1 and 3, involved interactions with PDs. These observations partly fit patterns reported for PDs from the Southwestern Atlantic where interactions with SRWs have been described to last up to 4 h and to consist of *Lagenorhynchus* spp. swimming around the larger cetaceans, although not near the fluke (de Haro & Iñíguez, 1997). I perceived and interpreted the behavior in sightings 1 and 3 as interspecific socialization. However, the delineation of some PD behavioral states remains blurry (Niebaum, 2022). Also, no exact conclusions can be drawn on one species' attitude towards the other—for example, whether playful behavior would have been uni- or bidirectional, or whether there was an acute competition over space and/or food resources. To me, it seemed to be the PD who decided whether, or not (sighting 2), to approach the SRW. However, the sound presumably emitted by the apparently younger SRW (sighting 3) might have been an acoustic signal directed at the dolphins. The "slap" might correspond to a "snort," hypothesized to be used by *Eubalaena* spp. to chase off *Lagenorhynchus* spp. (Würsig, 2009). It is unclear what caused the visibly excited PDs to keep their distance to the SRW in sighting 1. The larger individual in austral spring (sighting 2) was apparently either ignored by the two PDs traveling by or actively avoided.

"Sailing" or "tail-sailing"—that is, the uplifting of the peduncle and fluke for several minutes—has often been observed in SRWs and other Balaenid species, although its function remains unknown (e.g., Hamner et al., 1988; Würsig, 2009). Among other functions, a foraging function has been suggested (Hamner et al., 1988). To my knowledge, sailing has not been reported for SEP SRWs. The upright sailing observed in sighting 2 soon changed into a more varied fluke/peduncle behavior, intertwined with body rotation, but was later repeated, interrupting travel activity. Combined with the breaches and emitted call, followed by the presumed male's departure, an intraspecific communicative function of sailing, possibly related to reproductive behavior, is suggested here. Upsweep calls have been hypothesized to serve intraspecific long-distance communication (Clark, 1982), and they have been recorded more often in traveling than during resting, and (to human perception) by lone rather than grouped individuals, of all age classes and both sexes (Clark, 1983, as cited in Jacobs et al., 2019).

It is unclear if some of the observed SRW behaviors in proximity to the opening of Río Chaihuín were playful and/or related to hygiene. At least sightings 2 and 3 likely comprised episodes of skim-feeding, likely on zooplankton (e.g., Valenzuela et al., 2018). Opportunistic spring foraging has been reported for SRWs elsewhere (Hoffmeyer et al., 2010). Accounts of SEP SRWs feeding on small vertebrates have been dismissed so far (Galletti Vernazzani et al., 2014), but SRW foraging strategies may vary greatly among individuals (Valenzuela et al., 2018). Thus, it is unclear whether in Bahía Chaihuín, SRWs additionally take advantage of small anadromous fish species, locally abundant in winter and spring, as has been concluded for PDs (Niebaum, 2022; L. Osman/The Nature Conservancy, pers. comm., 2014).

The fact that there were only three SRW sightings over two years demonstrates that Bahía Chaihuín offers SRW habitat for an infrequent but recurring use during their understudied migrations. Timing of the sightings largely coincided with others from the SEP north of 47/41/40° S (Aguayo-Lobo et al., 2008; Galletti Vernazzani et al., 2014; García-Cegarra et al., 2021). They potentially confirm that the SRW subpopulation prefers coastal waters during winter and spring but do not dispel speculations about summer/fall subantarctic vs offshore migrations (Cooke, 2018; Cooke & Zerbini, 2018). Nevertheless, upsweep calls have recently been recorded at Isla Chiloé, also in summer and fall (Jacobs et al., 2019). Regarding Los Ríos Region, locals, including staff of the nature reserve Reserva Costera Valdiviana, run by The Nature Conservancy, told me about a SRW spending several days and giving birth in Bahía Chaihuín a few years prior to 2013. Though seemingly undocumented, the occurrence of such an event in the sheltered, shallow bay is not unlikely, and I strongly encourage further research as much as the maintenance of collective conservation efforts.

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