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Bull sharks in the Vashishti River, western India: insights from social media

Bull sharks *Carcharhinus leucas* in a Vashishti River gillnet (screenshots from original footage.). © P. Koli.

Bull sharks, *Carcharhinus leucas* (Valenciennes, 1839), are euryhaline elasmobranchs capable of inhabiting both marine and freshwater environments (Gausmann 2021). As apex predators, they play a crucial role in maintaining trophic dynamics, particularly in riverine and estuarine habitats that also serve as their nurseries (Dwyer et al. 2020). Despite their ecological significance, very little has been known about their biology and movements, especially in freshwater areas.

Social media platforms have emerged as a valuable tool for ecological monitoring, enabling broad data collection and real-time tracking of species distributions (Ghermandi & Sinclair 2019). Passive citizen science—where impromptu ecological observations are shared publicly outside formal campaigns—has proven valuable for documenting wildlife occurrences (Edwards et al. 2021). Examples span from crowd-sourced bird sightings (Davis et al. 2017) to social media records of Clown Wedgefish *Rhynchobatus cooki* distribution (McDavitt & Kyne 2020). This study uses passive citizen science data from Instagram, a social networking service, to provide evidence of bull shark utilization of the Vashishti River, Maharashtra, highlighting the value of social media data for ecological monitoring.

In April 2023, a 90-second Instagram video (posted by @prajyot_koli_0011) documented three bull sharks captured in a gillnet in the

Vashishti River, Maharashtra. The footage depicts a local fisher retrieving the net containing three sharks, each estimated at 1.2–1.5 m in total length. Identification as *C. leucas* was made based on multiple morphological features visible in the video: a short, rounded snout; proportionally smaller second dorsal fin; distinct crescent-shaped precaudal pit; anal fin lacking a prominent notch; and the characteristic, black-tipped fins with dark upper caudal margins (Compagno & Niem 1998). Both the video and its accompanying caption identify the location as the Vashishti River. Screenshots of key diagnostic frames are provided as supporting information.

The Vashishti River, which originates in the Western Ghats and drains into the Arabian Sea along Maharashtra's Konkan coast (Nasnodkar & Nayak 2018), has now been confirmed through this video evidence to serve as a habitat for bull sharks. However, the precise capture site within the river system remains uncertain due to the absence of distinguishable geographic markers in the footage and potential influence of tides on shark movements.

The incidental discovery of bull sharks in the Vashishti River via Instagram underscores the growing value of social media platforms in modern ecological monitoring. While such opportunistic data have inherent limitations including potential geolocation inaccuracies and identification uncertainties, this study highlights how citizen-contributed observations can reveal previously undocumented occurrences. These findings warrant further investigation into the bull sharks' seasonal movements, habitat use, and possible nursery areas within the Vashishti River system. Future studies should prioritize collaboration with local fishing communities to assess population status and identify conservation threats, particularly bycatch in gillnet fisheries, as in the video.

Acknowledgement
The screenshots analyzed in this study were derived from publicly available Instagram content posted by Shri Prajyot Niwate (@ prajyot_koli_0011). Their use falls under fair dealing provisions for non-commercial scientific research in accordance with relevant copyright law. The author gratefully acknowledges Shri Niwate's original documentation of this ecological event and affirms that the material has been used solely for scientific purposes, with no commercial intent.

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