

## 5.1 Crustacea Mass Migrations

**Spectacular animal mass migrations are by no means limited to the vertebrates of the world. It is a universal phenomenon found in all major animal groups including birds, mammals, fish, reptiles, amphibians, insects and crustaceans (Section 4.2)<sup>1</sup>. What prompts migration varies from climate triggers to food availability to requirements around breeding with some remarkable feats being reached by animals of all types.<sup>2</sup>**

Although often small in body size, the epic journeys that many crustaceans undertake to feed or complete lifecycles are no less impressive. Well known examples are the daily movement of shoals of krill across the Southern Ocean, rising hundreds of metres to surface waters in the evening to feed and descending at daybreak to ocean depths to avoid predators.<sup>3</sup> Not all migrations follow diel (day and night) patterns, breeding mass migrations follow longer term biological cycles such as the long distance movements of juveniles of deep water *Panulirus* – a type of rock or spiny lobster.<sup>4</sup> Most interesting and certainly the most strikingly visible are crustacean mass migrations in the coastal environment. Well documented are the red crabs of Christmas Island in the Indian Ocean, where the synchronised mass movement of millions of crabs commence when tide and season are right. Adults emerge from burrows on the rainforest floor and walk in tight-lined platoons to the sea to breed.<sup>5</sup> Although crab movement to the sea has been recorded on this grand scale, few records

exist of the reverse movement upstream. The earliest observation was almost a century ago in Calcutta, India where local drinking water intake pipes were physically blocked by small crustaceans on the return journey from the sea.<sup>6</sup>

At home in KZN, we have our own example of this type of reverse migration with this phenomenon having been observed frequently along our coast for many years. At particular times of year, generally harmonised with the new moon, millions of small, pea-sized scurrying creatures move from the ocean into the nearest estuary and swim upstream on the incoming tide,<sup>7</sup> looking for a home to metamorphose. These are the last swimming stage or megalopa larvae of *Varuna litterata*, otherwise known as the paddle crab. *Varuna* is widely distributed across the Indo-Pacific region, can reach 7 cm carapace width and has a tendency to colonise fresh waters as an adult to live and forage. However, despite long-range movements away from the coast, it is still compelled to return to the sea to breed.

*Varuna's* travels remain a mystery to the scientific world. Nothing is known of where eggs hatch or where larvae initially develop, only that they migrate back to estuaries to complete their development. Besides moving vast distances for its size, this animal is also a physiological marvel given the difficulties of moving directly between salt and fresh waters in a matter of days.

*Varuna litterata* megalopae undertaking their migration from the sea into coastal rivers.



Photo: Andrew Kemp

