

## MARINE AND FRESHWATER ECOLOGY: DISCUSSION

**Marine:** (Initials: KH=Keith Hiscock, RI=Robert Irving, Q=Unknown participant)

*Q: How did the Mediterranean corals reach Lundy - by currents or by dropping off the bottom of a boat?*

**KH:** We mentioned the decline in some of the marine species that is occurring in Lundy waters. There are long term cycles in the marine environment e.g. the Russell Cycle. Every 30/40 years there are periods of about five years when the abundance of larval fish and larvae of benthic invertebrates is very high. During the 1950s and 1960s the North Atlantic Oscillation was in a strong negative phase but is now becoming positive. It is the character of water masses that creates good conditions for some species to recruit well and survive, but these conditions have not been good for some time.

To answer your specific question: the Devonshire cup coral has a fairly long planktonic larval stage, up to a month, and it can settle considerable distances from the adults and consequently the species recruits readily. The Mediterranean yellow cup corals have a short larval phase and usually settle close to the adults. These corals occur in five known areas in Britain - Lundy, Lyme Bay, Plymouth, Scilly Isles and off the Lizard peninsula. These populations can either be relicts of a much larger widely-distributed population or can be brought over from Brittany by jet-stream currents and deposited by chance at Lundy and in the other areas. They need a strong jet-stream current to get over from Brittany and these currents do occur. They were discovered at the end of the eighteenth century. It is important to remember the long term changes I mentioned - every several decades there are very good conditions for species recruitment and survival. I am sure that the Lundy species will increase in the future.

*Q: In freshwaters there is often a more restricted flora and fauna with speciation occurring. This is not the case in the marine environment. Also why do you find such a great diversity of plants and animal species in the waters around Lundy?*

**RI:** There is far less discontinuity between different marine habitats as all are linked by the sea. Lundy has a variety of different habitats - exposed, sheltered, strong tidal stream areas, which allows a diversity of plants and animals to live, compared with nearby coastal waters. There is not the speciation and endemism occurring as in the isolated freshwater habitats.

**KH:** The importance of Lundy in terms of its marine life is, as Robert says, its great variety of habitats, shallow, wave-exposed, sheltered, rock, sediments; it is this variety that allows such a great diversity to develop and survive.

*Q: Has there been an evaluation of the No-Take Zone with regard to teleost and elasmobranch fish?*

KH: Fish surveys were considered in the initial planning of the monitoring programme. Fish-watching stations and the counting of fish are difficult to set up and it is easier to use sedentary animals for quantitative assessment with meaningful statistics. It would be more difficult with the bottom-living dogfish (elasmobranchs), but it is possible with some teleosts e.g. wrasse, as techniques are available. The monitoring of fish should be considered in the future.

**Freshwater:** (Initials: JG=Jennifer George, RA=Roger Allen, KG=Keith Gardner, DK=Diana Keast, JM=John Morgan, Q=Unknown participant)

*Q: Have any amphibians been recorded on Lundy?*

JG: There are no records of amphibians as far as I know. Amphibians rarely occur on isolated islands as they are not good travellers.

*RA: I was surprised to hear that there are carp in Pondsbury, as it is very shallow. Also there is a large reservoir at the end of The Quarters which used to contain fish. Are they still there?*

JG: In 1976 Pondsbury dried up and Chris Baillie and Mick Rogers transferred Crucian carp from Pondsbury to the Quarry Pool. In January 1977, 30 Crucian carp were returned to Pondsbury. In 1986 we saw several, but a much-needed survey of the fish has never been done. Pondsbury is now 1.8m deep in places, particularly after the dredging in 1995.

KG: There is a medieval document listing two tenements and a vivary. A vivary is a monastic term for fish pond which usually contains carp. There could have been carp on Lundy at that time, but I am not inferring that the present carp have medieval ancestors.

JG: There have been introductions of fish, for example Martin Coles Harman introduced golden carp to Quarry Pool. Perhaps, his daughter, Diana Keast, can help here?

DK: My father did move the fish about from pond to pond quite a bit.

*Q: What other fish occur in the Lundy freshwaters?*

JG: Tench occur in Quarry Pool as well as Crucian and Golden carp. Rocket Pole Pond mainly has a large Mirror carp population. With regard to the other question about fish in the Quarters reservoir, as far as I know these have never been studied. (N.B. In November 2006, Roger Fursdon informed us that when the Quarter Wall pond dried up in September 2006, he rescued about 100 rudd and placed them in the Rocket Pole Pond).

*Q: You mentioned that the isopod Asellus meridianus is often the only species found on islands. Is it a definite species?*

JG: It is a definite species. On the mainland it does occur with the more common *Asellus aquaticus*, but on islands it is often the only species found, as on Lundy, the Isle of Man and the Scilly Isles.

*Q: How does Asellus get to Lundy?*

JG: The female carries the eggs in a ventral brood pouch and the eggs remain viable for some time. Freshwater organisms can be picked up by birds and carried from one habitat to another and probably this species was picked up from the mainland and transported to Lundy many years ago.

*JM: You mentioned the high level of nitrate in the Rocket Pole Pond. Is this due to the large population of Mirror carp present and the fact that they are fed by visitors in the summer?*

JG: The high levels of nitrate and phosphate are due to the Mirror carp and also the ducks that regularly frequent this pond. Carp feed mainly in the summer and feeding by visitors probably helps their survival. The pond has no through drainage which allows the nutrients to build up, and this is the reason for the prolific algal blooms that frequently occur, giving the pond a 'green soupy' appearance.