Enhancing site fidelity information by identification of individual *Raja undulata*

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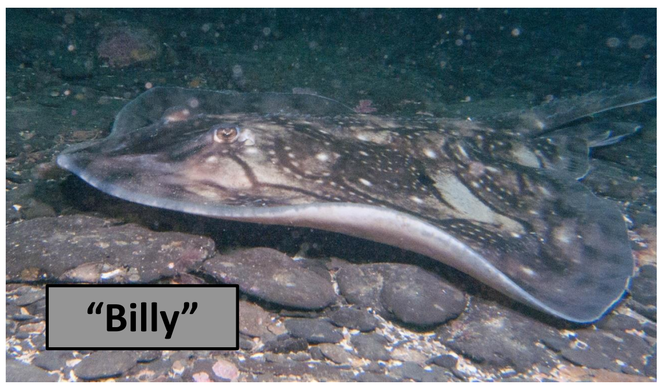
Introduction

Individual undulate rays, *Raja undulata* can be uniquely identified from photographs of their dorsal surface which exhibits a unique pattern.



Divers have monitored undulate and other rays on a particular Dorset site and shown that individuals return to the same site over prolonged periods and over successive years.

Site Results

- 163 ray encounters with divers in 3 years
  - 135 undulate rays,
  - 20 spotted rays,
  - 5 thornback rays
  - 3 species not recorded
- Undulate rays - 60% female and 39% male.
- 121 identifiable with photographs
  - 25 repeat encounters, i.e. the individual ray had been seen on the site before.
- **96 individual different undulate rays**
- **19 of the individuals (20%) seen on more than one day.**
- **8 individuals have been seen on more than one year.**
- **"Billy" - seen 5 times over three years.**

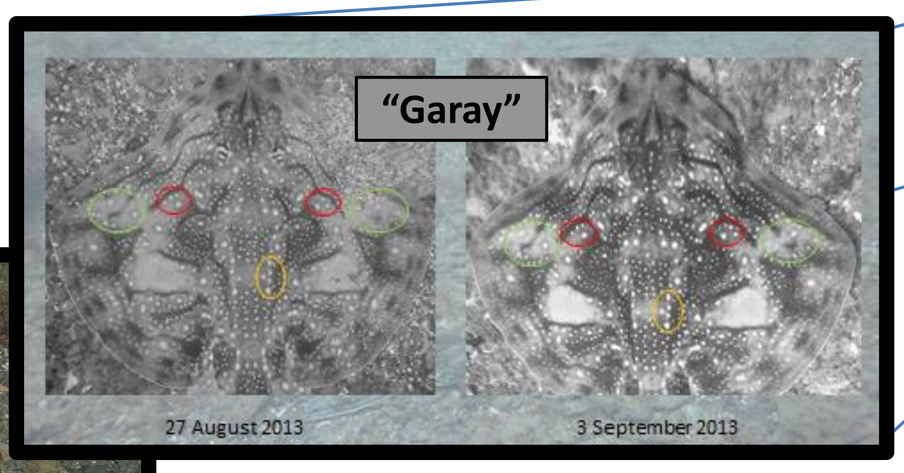
Conclusions

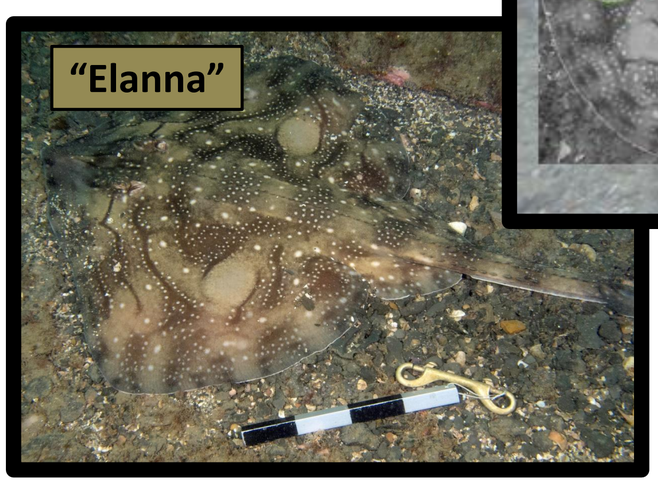
- Undulate rays, *Raja undulata* have a unique pattern on their dorsal surface that can be used to individually identify the ray.
- Using this technique rays have been recorded repeatedly returning to one particular Dorset site. Site fidelity for individual fish has been demonstrated to within approximately 30-metres over successive years.
- Similar sites are likely to exist however the importance of this or similar sites to ray populations remains unknown.

Methodology

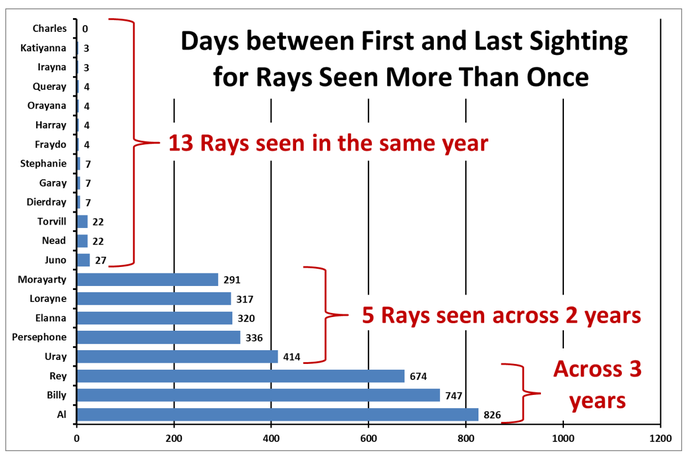
Rays are found resting on the seabed and most can, with care, be approached and photographed for identification. A good quality image is not essential, but the full width of the ray in the photograph allows a better analysis of the individual pattern. Prior to analysis the images are processed to be the same size, colour, format and orientation. Pattern matching of the individual rays is assisted by a software application, Wild-ID, freely available as a download from the website of Dartmouth College, Hanover, U.S.. Individual identification of each ray is based on its markings, which are asymmetrical on the wings, body and tail.

Each ray is individually coded and the data stored in a custom database to allow easy analysis of repeat sightings.





Divers visit the site on relatively few occasions, however, the occurrence of repeat sightings has increased as the project continued. Repeat sightings are approximately 1 in 5 and may be days or years apart. The data suggests the rays represent a relatively small population that visit the same area/site on a regular basis.



Where possible photographic scales are positioned alongside the ray to provide additional dimensional data relating to their size and maturity.

References

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Rays and skates: a revision of the European species. Robert Selby Clark. HMSO publication 1926.

Further Information

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