Protocol for Citizen Science Slipper Limpet Surveys

Aim: to collect qualitative presence and absence data of slipper limpet (Crepidula fornicata), locations, numbers found, removal and photo ID by volunteers

Biosecurity: this species are very successful reproducers, and it is vital that we do not help spread them particularly between sites of presence and absence.

Please always follow the **CHECK, CLEAN, DRY** rule. More details can be found here:

https://www.nonnativespecies.org/what-can-i-do/check-clean-dry/field-workers

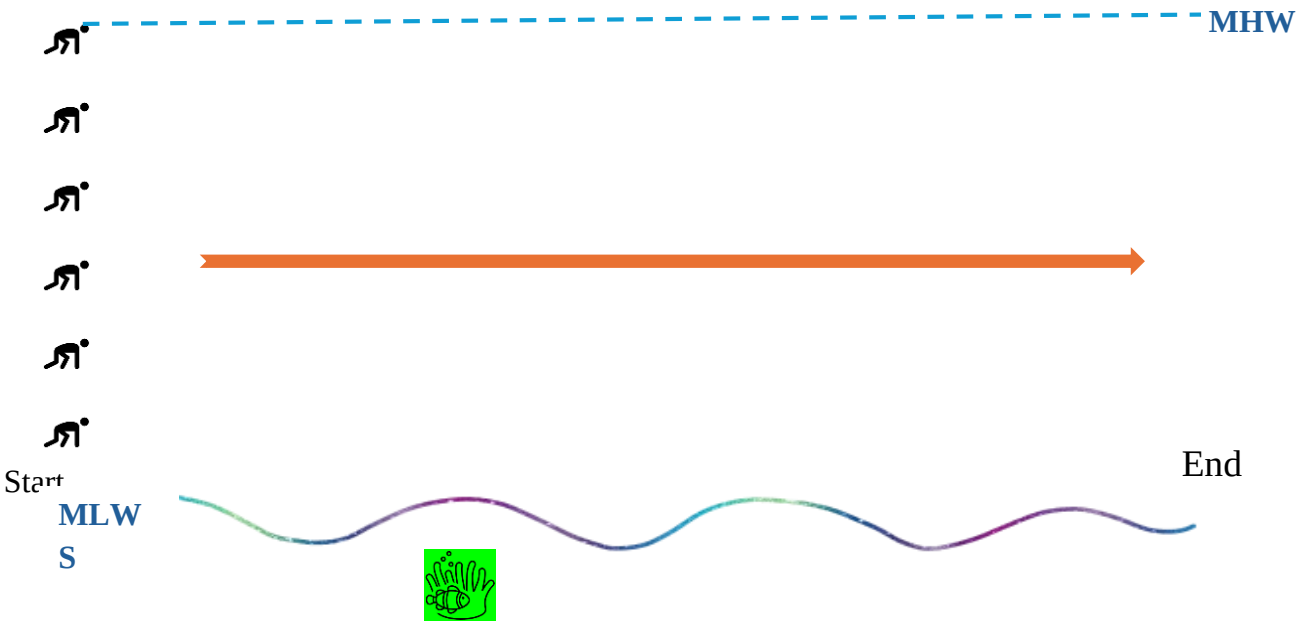
Make sure boots and equipment has been dry for at least 24hrs before survey.

Disposal: slipper limpets must be disposed of on land to prevent the release of larvae. They can be frozen, eaten or buried above the high water line.

Location and timing: It is best to carry out survey at low tide on a big tidal range if possible such as spring tide (MLWS = mean low water springs). Slipper limpets are predominantly found in the subtidal range but exposed on a low tide.

We do not endorse lone working. It is best to carry this out with a few folk so that you can better cover the area in a line search (see diagram). Ensure there is enough daylight.

Use the recording sheet provided to capture all the required information.



Mapping and recording

1. Take a note of the latitude and longitude coordinates (to 5 decimal places) at the start of your survey. You can decide on the length of the survey by limiting the time e.g.

decide on searching for 1 hour. However, you may be limited by access issues if the shore becomes inaccessible.

2. From the low tide area, spread out perpendicular to the sea and slowly walk along your search area. Record location of any clusters* as you progress along the shore, or mark if there are individuals. Areas where there are no identified slipper limpets will be concluded as **inferred absence area**. If absence is due to **inaccessibility**, record "NS" (Not Surveyed) rather than "0" to differentiate between lack of species and safety restrictions.
3. Make a note of any interesting features such as how many in a stack, if roe is present (yellow eggs - see photo 1).
4. Take photos of living slipper limpets for ID.
5. Attempt to remove slipper limpets from their stones by knocking off with small hammer or pliers (or similar tool) wearing gloves to prevent cuts. Collect in bucket.

***More than 3 slipper limpets together in one spot**

Photo 1. Slipper limpet roe: females produce between 11,000 and 55,000 eggs in stalked capsules that are brooded inside their shell for 2–4 weeks. Reproductive season usually runs between April to October.

6. Record the coordinates of the end of your shoreline survey.
7. Clean boots and equipment with fresh water and allow to dry before re-using.
8. Pass your data recording sheet to Terrie Sawyer (Terrie@morayfirth-partnership.org)
9. Have fun and Thank you!

Equipment List:

- Recording sheet and waterproof protector if possible
- Tide times
- Hand held GPS or smart phone
- Camera or smartphone
- Gloves
- Bucket or strong bag for shells
- Tool to remove shells from rocks e.g. small hammer/pliers
- Weather proof clothing and rubber boots
- Boot cleaning solution – fresh water
- First Aid kit

Identification – see document **About Slipper Limpets**