Report on Ramp Use by NZSL Pups in the 2017/18 Season in the Auckland Islands

Prepared by: Thomas Burns

May, 2018

Figure 1. A NZSL pup using a wooden ramp to exit a muddy pool in Sandy Bay, Enderby.

Introduction

The habitat of the Auckland Islands breeding colonies of New Zealand sealions contain a series of waterways including: streams, pool and peat bogs. The steep, high sides and undercut banks of these waterways can prove inescapable to the pups as they venture off the beach in late January. Many of these waterways have no viable means of escape for the pups and consequently they drown (Childerhouse et al. 2014, 2015, 2016). Sealion researchers on the island during the breeding season have helped to reduce this mortality by rescuing trapped pups manually and installing wooden ramps to help the pups self-rescue (*Figure 1*). Monitoring of the ramps by cameras has occurred since the 2013/14 season (Childerhouse et al. 2014, 2015, 2016). Enderby Island has 15 permanent and temporary ramps installed in Sandy Bay (*Figure 2*.) Four of these were new in the 2017/18 season. Dundas Island has 9 ramps of various ages installed in it's waterways (Childerhouse et al. 2016).

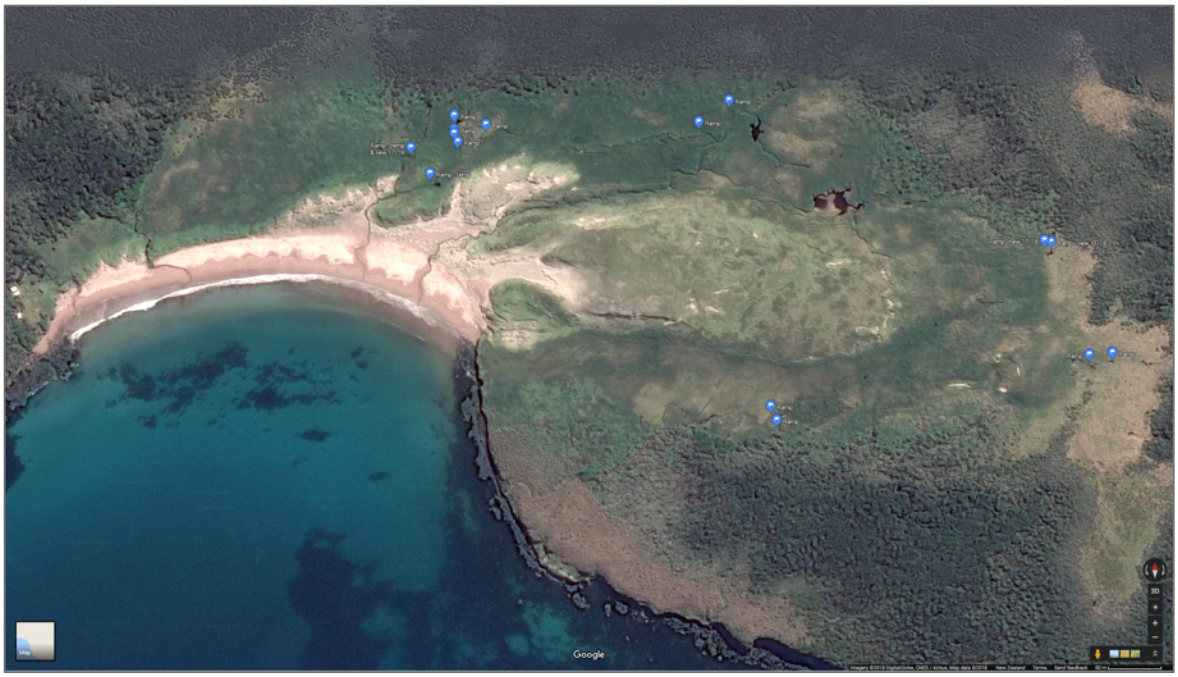

Figure 2. Blue markers show the location of ramps at Sandy Bay, Enderby.

Aim

The monitoring of ramps from 2017-18 New Zealand Sealion (NZSL) season was used solely to assess the usefulness of a given ramp and determine any impacts caused by new ramps added in the season. In the 2016-17 NZSL season no new ramps were installed and therefore no monitoring using motion activated cameras was undertaken.

Ramp Installation & Monitoring

If an area of waterway habitat on Enderby Island was considered to pose a risk to the NZSL pups then the installation of a ramp by the field team was considered. The assesment was subjective with several factors taken in to account including: the steepness and height of the banks surrounding a waterway, the proximity of pups to the waterway and whether any pups had already been rescued manually by the field team from the area previously. If a ramp was installed then a motion activated trail camera was installed facing the ramp and set to either recording still images or video. The footage could then be reviewed to see if pups had used the ramp to exit or enter the pool and if the ramp caused any unforseen disturbance or injury to the pups or other wildlife.

Results & Observations

Four new ramps were installed in wateways in the 2017/18 field season. These ramps were observed using the motion activated cameras. Only one pup was recorded falling in to a hole, apparently by accident. However all the ramps were observed to be useful and allowed pups to exit the waterway via the ramp, a summary of this may be seen below in **Table 1.**

Table 1.

The number of NZSL pups using ramps to escape waterways at Sandy Bay, Enderby 2017/18

Ramp	GPS location	Date installed	Period camera monitored for (hr)	Pups exited using ramp	Pups entered pool intentionally	Pups observed falling in pool	Notes
2018-1	50.498970° S, 166.284910° E	28/01/18	79.9	6	0	1	The camera was knocked askew during the night of 28th, this was corrected and the period omitted from monitoring time.
2018-2	50.499090° S, 166.284320° E	29/01/18	62.6	10	0	0	The IR flash was too bright rendering monitoring at night useless.
2018-3	50.499900° S, 166.292740° E	23/02/18	105.8	12	0	0	Due to an error the camera only recorded events at night
2018-4	50.499910° S, 166.292830° E	24/02/18	91.0	9	7	0	Pups intentionally entering the pool used both the ramp and the bank adjacent to the ramp.

In addition to allowing pups to exit the waterways, pups were observed purposefully entering the pool using a ramp or the nearby bank. No injury or similar negative interaction was observed as a result of the ramps. All of the ramps showed Auckland Island teal using them with no ill effects. No adverse environmental impacts were observed.

An adult female seal was observed on camera using one of the ramps to enter and then exit a steep sided stream. Pups were observed on camera using the ramps in shallower pools more as stepping stones, rather then traversing the full length as construction intended. In deeper pools pups were observed using the full length of the ramp to climb out, even at a a steep incline.

No new ramps were installed in the 2016/17 season

Conclusions

- Ramps do allow pups to exit from small and large waterways including pools, bogs and streams.
- Pups will fall in to waterways by accident.
- Ramps cause no apparent harm to seals or other wildlife.
- Ramp design could be refined and improved to allow better access by pups.
- Pups will enter some waterways willingly where ramps are installed, this may or may not be because they have determined or have learnt that these pools are able to be easily exited. This appears to be more likley in pool rather then stream habitat.
- Using motion activated cameras to monitor ramps is a useful way to observe that ramps: allow the escape of pups, cause no harm to wildlife, are used by the pups in different ways and therefore inform the ways that the ramps could be improved to help ease pups passage.
- Using motion activated cameras to monitor ramps does not allow an count or estimate of the total number of individual pups saved from bogs.

Discussion

Ramps remain useful for allowing pups to escape from waterways where they would not otherwise be able to. While only one event was picked up on the monitoring cameras which showed a pup falling in to a waterway. This is largely due to camera postion and the field of view not being able to cover the entire waterway, only the exit ramp.

If accurate ramp usage data is required from all the exisiting ramps on Enderby a larger number of cameras will need to be put out, for a longer duration.

If data is needed on the absolute numbers of pups that are saved from drowning by the use of ramps, then a new robust methodology will be required that takes in to account:

- Individual pups that use the ramp(s) more then once,
- Pups may view a '*ramped pool*' as a safe habitat and therefore utilise it as a play pool and enter/exit the pool multiple times.
- the possibility that dead pups may provide '*stepping stones*' to the live pups and therefore reduce the total number of potential dead in a given pool.

Even with the installed ramps, manual rescues of pups by the NZSL field team is still important because: the NZSL colony can move through different areas of Sandy Bay year to year, also the nature of the waterways means there are some changes year to year in the habitat (eg. Stream banks collapsing); and the fluctuation of water heights within pools following heavy rain or lack thereof, can mean some pools become more/less difficult for pups to escape. In this 2017/18 season 14 pups were manually rescued from waterways on Enderby (S.M. Michael, personal communication, May 14, 2018).

On Dundas Island this season 29 pups were manually rescued from waterways even though the field team was only present for several days. This number is likely due to the larger NZSL colony here and also it occured at the part of the season when naïve pups first move on to the sward and among the

waterways. Dundas is significantly smaller and the habitat appears to be less changeable then Enderby. If a greater number of new ramps are installed here here it should mean minimal or no effort is needed by a field team to rescue pups should be sufficient. This is important as a field team is not here for most of the season.

The cameras demonstrated that pups would enter pools willingly, possibly because there was a ramp and thus a route of exit nearby. This will skew any numbers of pups 'escaping' the waterway using the ramp. However it does not negate the need for a ramp in that pool. In addition this phenomenon was only observed in the pool habitat rather then the smaller pits in streams

Ramp Construction

Ramp construction needs to be robust because adult animals may use them. The exisitng wood and nail construction seems suitable but this should be kept in mind for future deign/construction. In shallower pits with shorter ramps, pups will often use the ramp as a single flipper hold and more like a step then a ladder or ramp. A physical step, or 'rock' substitue may provide an alternative method of exit. When exiting from deeper pits, pups will use the length of the ramp as intended to climb out of the hole. In both scenarios above a wider ramp would probably allow an easier path for the pup to exit and the exisiting ramps may be slightly too narrow. However it is worth noting that some holes are simply not wide enough to fit a wider ramp.

Envrionmental Impact

Ramps put in to pools or bogs have minimal environmental impact, they are easier to install and the habitat is less likely to change. Ramps put in to stream habitat often require more thought and discretion in their placement. This is because: there is usually less room to install them, the ramp may hinder the flow of water and because the moving water in a stream may cause the bank structure to change year to year. In several locations we have moved to a mobile/temporary ramp that is installed and removed each season. This is only applicable with an annual sealion team and because the sites in question are only problematic earlier in the season and are no longer a threat once the field team have left the island. As mentioned there is some use of the ramps by Auckland Island teal but no negative interactions have been observed.

Limitations

There were some cameras that were not performing optimally (this may have been user, hardware or software error). The cameras should be re-checked to confirm they are fully functioning. Cameras would sometimes shoot on a false-positive where the wind, grass or sealion moving the stake caused the sensor to activate even though there was no seal in the field of view. This increases the time spent on data analysis and reduce battery and card life. It was also difficult to ensure the camera was pointing exactly where needed. In order to increase stability and to provide more control over the direction the camera is facing I suggest trialing a robust ball-head mount either attached to stake or a pegged down tripod.

Recommendations

- To mitigate pup mortality:
    - Install new ramps on to Dundas island and fix or remove existing ramps where necessary. (This will require new materials to be sent down).
    - Continue to use the exiting ramps on Enderby and implement new ramps where necessary.

- Investigate in the field, the use of physically wider ramps to see if pups find it easier to move up them.

- Investigate in the field, other methods of exit from the holes (eg. single steps or boxes in the shallower pools).

- If detailed information is required on ramp use by pups then more cameras, deployed for longer are needed.

- If an estimate of total pups saved from drowning is needed then a new method for assessing this needs to be developed.

Summary

Ramps remain a valuable management tool for allowing NZSL pups to escape waterways and ramp installation and use should continue, with refinements if/where necessary. Monitoring of the ramps with motion activated cameras allows the usefulness and impact of a given ramp to be assessed, however a much more robust method is needed if absolute numbers of pups using the ramps is required.

References

Childerhouse S, Hamer D, Maloney A, Michael S, Donnelly D and Schmitt N (2014) Final report for CSP project 4522 New Zealand sea lion ground component 2013/14. Department of Conservation, Wellington, New Zealand.

Childerhouse S, Michael S, Adams L, Burns T, Cockburn S, Hamer D, Maloney A, Pugsley C (2015) Final Report: New Zealand sea lion research at the Auckland Islands 2014/15. Blue Planet Marine 2015, Document Reference Number: BPM-15-Final Report for NZ sea lion research at the Auckland Islands 2014-15 v2.2

Childerhouse S, Muller C, Burns T, French R, Kay E (2016) Final Report: New Zealand sea lion ground component 2015/16. Blue Planet Marine 2016, Document Reference Number: 2015/16 BPM-16-Final Report for CSP Project NZ sea lion ground component 2015-16 v1.3 2/06/2016