

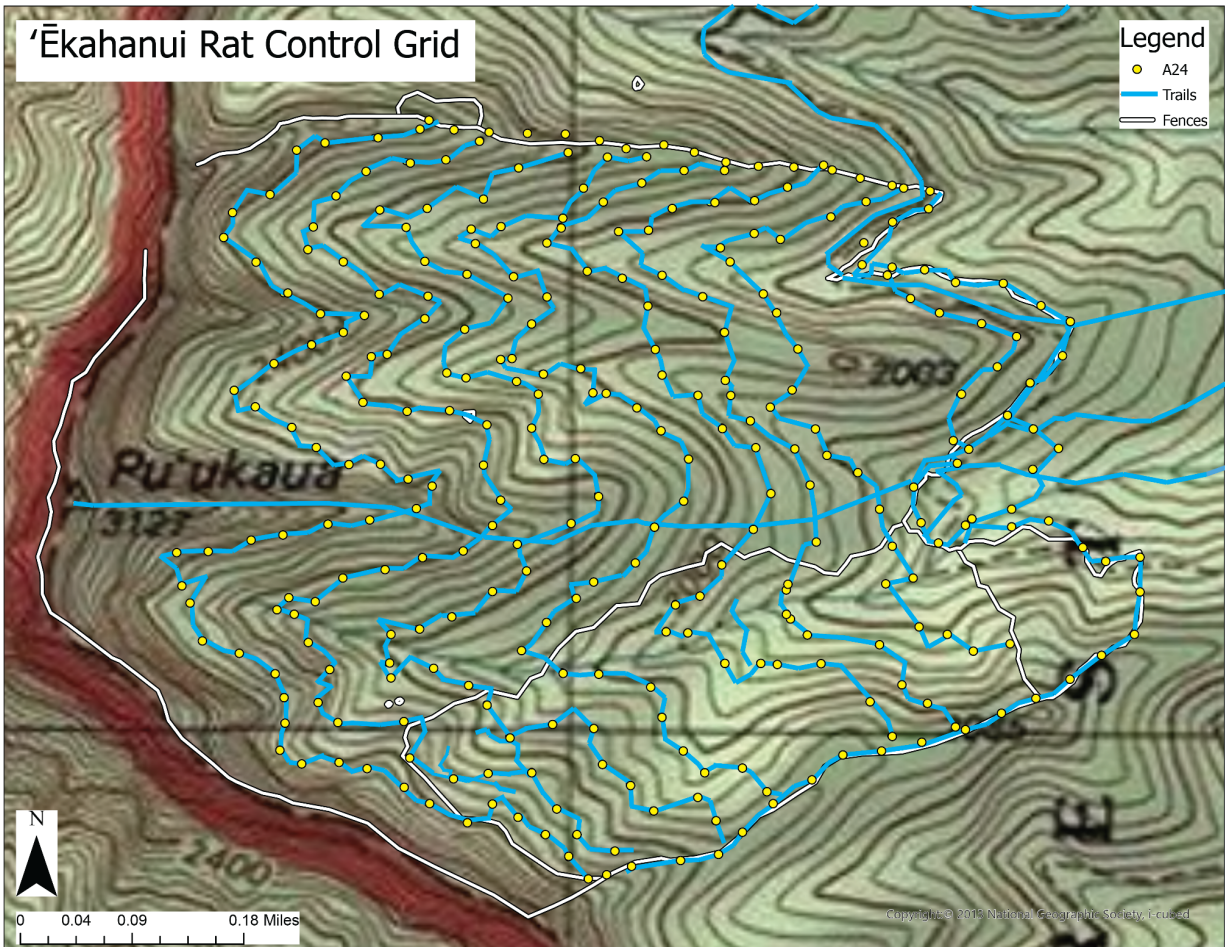
Appendix 4: Grid design

Ecosystem-level grids are most effective at reducing rat numbers across landscapes to ensure protection for rare and common species, compared to smaller trapping efforts. ANRPO has been designing and constructing grids for over ten years. Here are some general guidelines.

1. **Sizing:** The larger the better!
 - a. The greater the area protected, the smaller the edge effect and the larger the area protected within the grid
 - b. Limits to grid size include:
 - i. Budget for traps
 - ii. Manpower for deployment and servicing
 - iii. Terrain
 - iv. Access
2. **Trap spacing:** The New Zealand standard is 100x100 meters. However, in ANRPO's experience, 100x50m is needed. ANRPO strongly suggests that programs begin at a higher trap density, monitor for effectiveness, and then, if possible, decrease trap density while ensuring that monitoring goals are met.

For example, ANRPO's goal is to achieve 10% tracking, as measured by tracking tunnels. Our 100x50m grids mostly met this goal, but 100x100 does not. Thus, we have maintained a standard of 100x50m.

3. **Trail system:** All grids need good trails! ANRPO runs trails 100m apart and places devices at 50m intervals, facilitating 100x50m trap spacing. The way programs design these trails is often dictated by the terrain. ANRPO has done trails on contours, as well as running up and down ridges and gulches. There are pros and cons to both.
 - a. Contour Pros:
 - i. Trails are easier to walk as they are flat across areas.
 - ii. Trails cross all terrain type evenly; gulches, ridges, and slopes
 - b. Up-Down Pros
 - i. Trails are much less prone to downslope erosion than contour trails
 - ii. More tiring way to move across terrain
4. **Grid examples:** Below is a figure of the 'Ēkahanui Grid in Honouliuli Forest Reserve on O'ahu.



This shows a grid system across the steep gulches of 'Ēkahanui. The trails run on contours, spaced 100m apart in elevation, and A24s are deployed with 50m spacing along the trails. For the most part, the trails follow the contour and thus are less exhausting to traverse (compared to climbing up/down trails). However, there is significant upkeep needed, as erosion constantly affects the trails, causing soil and rock to come down. An even larger impact is the constant accumulation of trees, dead and alive, on the trails. In particular, Christmas Berry needs to be constantly cleared.