

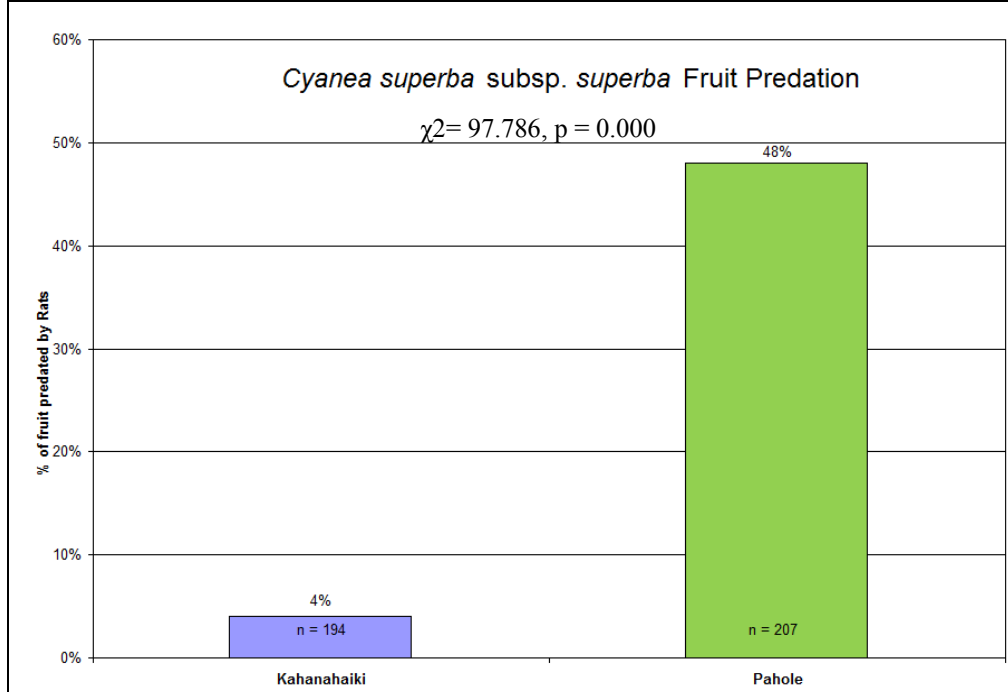
7.6.2.7 *Cyanea superba* subsp. *superba* Monitoring (Kahanahaiki MU & Pahole NAR)

The rat control grid was effective in reducing the amount of predation on *Cyanea superba* subsp. *superba* fruits at Kahanahaiki during the fruiting season (late-November 2009 through early-January 2010). There was a significant difference in fruit predation between sites with eight predated fruits out of 194 (4%) monitored at Kahanahaiki, as compared to 99 predated fruits out of 207 (48%) monitored at Pahole (see graph below). These data were presented as a poster at the Island Invasives: Eradication and Management Conference (Auckland NZ, February 2010) (see excerpt from poster). The poster may be viewed in full at the following URL: http://manoa.hawaii.edu/hpicesu/DPW/In_NZC/default.htm



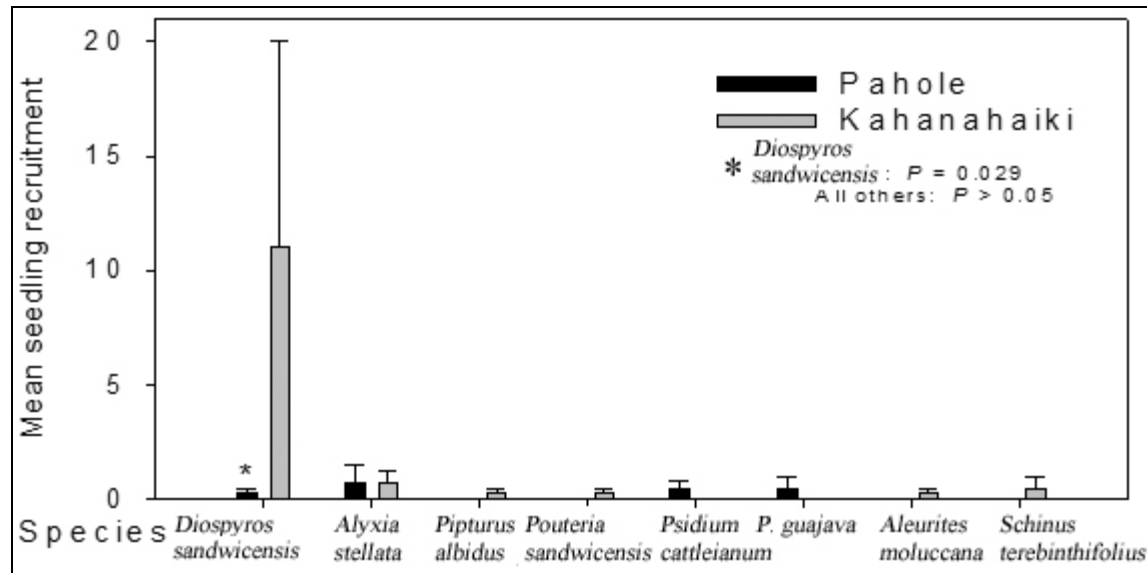
Rat climbing trunk of *Cyanea superba* subsp. *superba* (Left photo). *Cyanea superba* subsp. *superba* fruit consumed by rats (Right photo).

Rat *Cyanea superba* subsp. *superba* fruit predation (Kahanahaiki vs. Pahole)



7.6.2.8 Seedling Monitoring (Kahanahaiki MU & Pahole NAR)

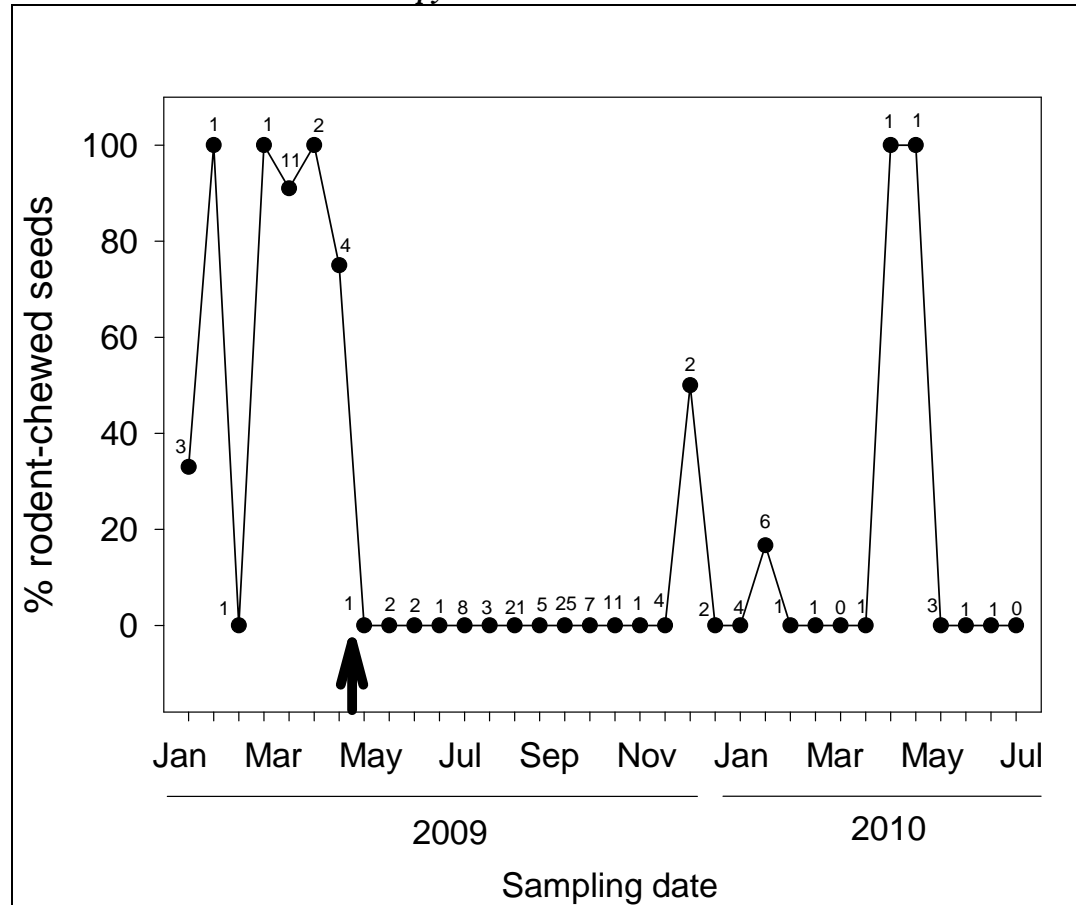
The figure below shows the mean \pm SE of seedling recruitment during a 6 month period (August 2009-February 2010) at the Kahanahaiki and Pahole where rodents were not manipulated. Seedlings for four native and four introduced plant species were monitored (see figure below). Only seedling plots (32 per site) with *Diospyros sandwicensis* (lama) overstory within 15 meters of the plots were included for calculations at both sites. There was only a significant difference in seedling recruitment for *Diospyros* at Kahanahaiki vs. Pahole (Mann-Whitney U test; See figure below).



7.6.2.9 Seed Monitoring (Kahanahaiki MU only)

The figure below shows the percentage of rodent-chewed lama seeds recovered from seed rain buckets during each two week sampling period at Kahanahaiki (January 2009-July 2010). The numbers above data points indicate the total number of lama seeds collected from buckets. Trapping started in May 2009 with seven months of no chewed lama seeds until December 2009. During the peak in lama seed production there was no seed predation detected. Lama seed predation has remained low during the running of the trapping grid.

Seed rain bucket results for *Diospyros sandwicensis* from Kahanahaiki



7.6.2.10 *Achatinella mustelina* Monitoring (Kahanahaiki MU only)

A total of 212 *Achatinella mustelina* were counted during the August 2009 census of the Maile Flats area of the Kahanahaiki MU (for more information see MIP 2009 Snail section; http://manoa.hawaii.edu/hpicesu/DPW/2009_OIP/005.pdf). This count was an increase from the 157 snails counted in the summer of 2004. A census of this area will be conducted every three years. If necessary this interval will be reduced to annually. Two ground shell plots were monitored quarterly (April 2009-April 2010) in the Maile Flats area of the trapping grid with no detections of rat predated shells, however two live *Euglandina rosea* were found.

7.6.3 Summary

- ❖ The number of rat captures continues towards a downward trend from the initiation of the trapping grid.
- ❖ Tracking tunnel activity was high in the interior locations of the trapping grid when distances from the perimeter to the interior were less than 100m during the fall and winter months.
- ❖ The tracking tunnels appear to be potentially tracking the natural cycle of rat activity outside of the grid because to the short distance across the management unit.

- ❖ Data collected on slug and *Euglandina rosea* numbers suggests that rat reduction does not cause increases in these highly invasive species.
- ❖ There was a detectable increase of native caterpillars and spiders at Kahanahaiki vs. Pahole.
- ❖ The rat control grid was effective in reducing the amount of predation on *Cyanea superba* subsp. *superba* fruits at Kahanahaiki (Year 1).
- ❖ There was a significant difference in lama seedling recruitment between Kahanahaiki and Pahole.
- ❖ Rat predation on lama seeds was greatly reduced while running the trapping grid.
- ❖ Continued data collection of annual tree snail counts, seedling plots, arthropods and *Cyanea superba* subsp. *superba* fruit predation will give us a better understanding of what rat activity thresholds must be met to maintain and increase rare and common native species.
- ❖ Bait consumption by invasive slugs poses a hurdle that still needs to be overcome. Alternative baits are currently being pursued (wax baits and scented lures).
- ❖ All monitoring components will be continued through August 2011.
- ❖ Trapping grid effort: grid set up ~230 people hours; trapping checks (49 visits) ~915 people hours from May 2009 to August 2010; Tracking Tunnel efforts at Kahanahaiki (once a month) has taken ~245 people hours and Pahole (once a quarter) ~35 people hours.

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