

TO: Representative Clift Tsuji, Chair  
House Agriculture Committee

FROM: Penny Levin, Executive Director  
E kupaku ka 'aina – The Hawai'i Land Restoration Institute

DATE: Friday, February 8, 2008  
( Submitted through email at [AGRtestimony@Capitol.hawaii.gov](mailto:AGRtestimony@Capitol.hawaii.gov))

LATE  
TESTIMONY

Aloha Honorable Chair and Committee members;

I am testifying in support of HB3425 which requests funding for farmer-based apple snail control research.

The apple snail, *Pomacea canaliculata*, has been a major pest to taro farmers for 23 years. In recent years, it has consume 18-25% of annual harvests and makes significant impact on huli (taro tops) survival at planting. The snail has increased the labor required to bring a crop to harvest by an exhausting 50%.

This voracious pest is on the list of the *100 Worst Global Invasive Species*. It is a major threat in more than 18 countries worldwide. The snail has infested taro patches, wetlands, streams, estuaries, ponds, springs, ditches and reservoirs on every island except Moloka'i and Kaho'olawe. Today, there are few taro growing areas that are snail free.

**Approximately 11,000 acres of wetlands and water bodies are at risk** of or already infested with the snail; only 5% of those lands are active taro farming lands – the rest are under private, public, state and federal jurisdiction.

**The snail is a known disease vector for rat lung worm and leptospirosis, making control of this pest a health concern** as well. The presence of large populations of snails has been observed to draw rates and mongoose to taro patches to feed on them, a further threat of disease and to endangered birds.

*And yet, taro farmers appear to be the sole advocates for bringing this pest under control. Neither DLNR nor USFWS have initiated control efforts.*

**Finding a cost-effective and environmentally safe apple snail control is one of the highest priority issues for growers.**

Four years ago, E kupaku ka 'aina began doing the ground work to make a case for more sincere involvement by state agencies and increased resources towards control efforts. We collaborated on an economic impact study, a statewide survey to find how far the snail had spread, researched everything we could find about the snail, interviewed farmers, researchers and agencies, and in 2006 produced a Statewide Strategic Control Plan for Apple Snails in Hawai'i. The plan outlines best management practices and recommendations on needed policy changes, management efforts, funding, partnerships and

research priorities, including the farmer-based research in HB3425 (the report can be found on line at <http://www.hear.org/articles/pdf/applesnailcontrolplanlevin2006.pdf>).

What we also found was that in 23 years, less than \$400,000 has been spent on snail control efforts. Just enough to ensure failure.

Past funding for apple snail controls has gone almost exclusively to HARC and UH and has left taro farmers with no realistic or affordable solutions; and in one project, may have made encouraged further spread of the snail.

In 2006, we returned to state and federal agencies, working closely with the Coordinating Group on Alien Pest Species, and asked what could be done to help make the plan bear fruit? **To date, no concrete action towards this plan has taken place among state agencies, leaving taro farmers no choice but to go directly to the legislature.**

Taro farmers has spent 23 years observing the behavior of the apple snail. Their own search for solutions have found promising alternatives based on realistic conditions. On Kaua'i, an organic cover crop rotation practice has been highly successful for one farming family. This is a practice that requires no lab testing as there are no chemical inputs, an important aspect for organic taro farmers. On Maui, taro farmers have partnered with Pacific Biodiesel in examination of an organic soil conditioner that appears to have positive effects on snail mortality.

As E kupaku ka 'aina watched the difficulty of invasive species programs fighting for funding, we made a commitment to find alternatives and partnerships that would support future control efforts. Pacific Biodiesel has willingly offered the opportunity for taro farmers to create a self-sufficient apple snail control fund – a first for invasive species programs in the state of Hawai'i. While this fund may not fulfill its promise right away, it provides a new model for control efforts that includes partnerships with agencies, business and innovation. Most importantly, farmers become key players at the table rather than “cooperators”.

The Grant-In-Aid proposal that goes with this bill provides much more detail regarding the tasks to be accomplished, accountability, quality control and allocation of resources for this request.

To answer specific questions that may come up for the legislature:

1. Is the *request personally benefitting any business or taro farmer*? No.  
If the organic soil conditioner proves to be environmentally safe and effective after careful testing, Pacific Biodiesel will gain the ability to close the loop on recycling cooking oil. It will eliminate any byproduct from the production of biofuel from entering the landfill.

Taro farmers will be compensated for crop commitments and the extensive amount of time they give to growing taro in the monitoring plots. In the past, UH and HARC researchers have done numerous studies with taro farmers where planting material, tilling and preparing the patch, weeding, managing water and harvesting is provided by the farmer during trials. No

compensation for that effort has ever been made, despite the fact that the crop may have been rendered unsaleable by the research trials.

While the tests will occur in the lab and monitoring done on Maui, the primary goal of this work is to assist the farmers of Kaua'i who have greater constraints in choosing control practices than other farmers due to their location within the Refuge.

E kupaku ka 'aina is a registered nonprofit that will manage and administer the project. They have also made a significant commitment of in-kind resources (time and expertise) to the project. Approximately 50% of the total project budget is matched by in-kind resources.

2. *Is the project promoting the use of a product without proper testing?* NO  
Currently, a single site has used the soil conditioner, strictly for the purposes of an organic fertilizer. The product is not available for sale on the market. On the recommendation of specialists within the state, field monitoring will be conducted there to evaluate two key concerns: soil and water portability and soil retention of any ingredients in the compound. The GOA makes it clear that careful lab testing will take place to determine environmental safety before any consideration of field tests at new sites.
3. *Are there existing controls for the snail?* Yes, but most are inefficient, labor and time intensive or inaccessible due to costs, availability of resources or agency limitations.

The primary controls used today include hand picking, ducks and dry down periods which force the snail underground. Hand picking is exhausting and never ending. Dry-downs increase weed encroachment into fields tremendously and can impact on the quality of the corms. Ducks, in combination with the first two practices significantly reduces overall labor and increase snail control. However; ducks are not readily available to most farmers. In places such as Hanalei, taro farmers can not use ducks due to the presence of native koloa (Hawaiian ducks). Their only option is hand picking. While that may be appropriated in a quarter acre patch; it becomes a full time job, in addition to farming the taro, for larger growers. This research has the potential to address this difficult situation and assist wetland mangers in reducing snail populations outside taro-growing areas.

4. *Will the work stand up to EPA standards and the scientific peer review necessary to determine environmental safety?* Yes.

A Review Committee comprised of experts in the field of human health, environmental health, pesticide science, stream and wildlife biology, and taro crop health and lo'i management. It also includes a snail expert. This group will be responsible to provide guidance on the development of monitoring protocols and review lab and field data for quality and accuracy. This group will also make recommendations based on the findings regarding future use of the compound.

CH2M Hill, a partner selected to conduct the lab testing has a high standard of quality control and assurance, documentation and testing. Lab results are evaluated by scientists at a number of

levels. Any laboratory used is reviewed for issues that may compromise or skew the results. The company has access to both Hawai'i –based and mainland facilities and can handle the complexity of the tests required.

The tests to be done under this project include:

- LD50 tests on all components of the compound (half live of active ingredients)
- Freshwater and soil degradation – bench tests (how long does it take for the compound to break down)
- EPA approved substitute fauna impacts (to determine risks to native species)
- Soil and water portability (how fast does the compound move through soil and water)
- Baseline soil and taro plant sampling and monitoring throughout (to determine soil and plant retention over time)
- Snail mortality and field response

Without these tests, we will not be able to meet taro farmers' own requirements for evaluating the safety and validity of the compound.

5. *How will E kupaku ka 'aina show accountability?* As an IRS registered 501 (c)(3) our end of year summaries, project reports and account reports are available for public review. The organization will work closely with all partners to ensure tasks are accomplished as promised.
6. *How will the work be documented and the information shared?* Video will be used to document each practice covered under the project. A training video will be made of the organic cover crop rotations model to share with farmers. Workshops will be conducted on four islands to share information and learn from the Kaua'i example. Public television and taro farmer meetings will increase outreach.

The results of the laboratory tests and field monitoring will be available through scientific papers to encourage peer review.

A project report will be provided to the legislature 20 days prior to the opening of the 2009 legislative session.

Mahalo for this opportunity to testify. I urge you to support bill HB3425.

Penny Levin, Executive Director

E kupaku ka 'aina – The Hawai'i Land Restoration Institute.

## Snail Facts

- A snail matures in 2-3 months and proceeds to lay from 4,000-8,000 eggs per year for up to an estimated 5-6 years. The eggs hatch in under a month and are so tiny they almost can't be seen. It breaths both in water and on land and can hibernate for months in dry mud.
- A taro patch (10-12 months of work) with high infestations can be consumed in a matter of days. They are non-discriminatory in their consumption of vegetation but prefer taro.
- The snail poses as serious human health risk. It is a vector for rat lung worm and leptospirosis. On Kauai, it is present in at least one and possibly two resevoirs. The presence of snails draws rats and mongoose who feed on them, a further threat of disease and to endangered waterbirds.
- The snails primary mode of dispersal between ahupua'a has been human transport; within an ahupua'a downhill travel and some upstream movement is self-propelled.
- Once the snail gets into fallow taro areas or adjacent wetlands, they are currently almost impossible to remove. These types of sites are a constant source of reinfestation to active taro patches and wetlands.
- The traditional Hawaiian taro varieties, many of which are so rare they could be considered endangered species, are at risk as well. Growing them in infested areas means extra work to control snails and extra risk of losing rare cultivars.

## Snail Control Research Facts

An estimated 22 snail control methods have been tested in Hawai'i or overseas, including chemical and organic practices, baiting and trapping, barriers, fallow periods, temperature changes, electroshock treatment, cover crops, tillage, trenching and mounding of fields, hand-picking, biocontrol, ducks, enforcement, outreach education and pest-for-profit programs.

*What has been evaluated in the last decade by agencies and farmers?*

HARC Papaya extract, neem, mugwort and yucca compounds, and ferric iron. Poor or inconsistent efficacy rates, expensive application costs (neem). Unknown impacts to crop quality.

DOA Copper sulfate. Moderate efficacy; environmental concerns for taro growers. Impacted crop quality.

UH Pest-for-profit program. Only worked when funding was available and may have caused further spread of the snail. Unrealistic economic, consumer demand and control capability projections.

Taro farmers Ducks, dry-downs, fallow periods, cover crops, tillage, barriers. Ducks are highly effective and significantly reduce labor when combined with other practices but problematic for DLNR and USFWS. Long term fallow (2-3yrs) can eliminate snails but alternate lands to continue farming are often unavailable. Cover crop rotations are highly effective.

Representative Cliff Tsuji, chair  
House Agriculture Committee

GLADYS KANOA  
FAMILY WITH 8 TARO FARMERS, KEANAE, MAUI  
FRIDAY, FEBRUARY 8, 2008

I AM TESTIFYING IN FAVOR OF HB 3425. WE NEED HELP DEVELOPING NEW METHODS OF COMBATTING THE MENACE APPLE SNAIL. OUR FAMILY HAS BEEN INVOLVED IN MOST OF THE EFFORTS OVER THE PAST 20 YEARS TO MITIGATE THE PROBLEM. OUR ONLY SUCCESS HAS BEEN THE USE OF DUCKS, AND HAS BEEN THE ONLY REASON WE CONTINUE TO FARM TARO. I BELIEVE THE SNAIL INFESTATION IS THE MAJOR REASON MANY FARMERS HAVE QUIT.

BECAUSE OUR MAJOR TARO FARMING AREA FOR THE STATE IS IN HANALEI, WHERE THE USE OF DUCKS IS NOT ALLOWED SO AS TO PROTECT OUR NATIVE DUCK KOLOA, WE MUST FIND A RELIABLE METHOD OF SNAIL CONTROL. THE STATEWIDE APPLE SNAIL CONTROL PLAN, COMPLETED IN 2006, OUTLINES BEST PRACTICES, RESEARCH NEEDED, AND ACTIONS NEEDED BY AGENCIES, FARMERS, LANDOWNERS. PLEASE SUPPORT BILL HB 3425.

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