KIA`I MOKU

guarding the island

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SPRING

A PUBLICATION OF
THE KAUAI INVASIVE SPECIES COMMITTEE

Invasive Species and AgriCULTURE

By Penny Levin

Mostly, we hear about invasive species as threats to the rare and endangered flora and fauna of the islands. Occasionally, an alien insect or fungus becomes an economic threat to agricultural crops in Hawai`i. But, there is one invasive species in Hawai`i, *Pomacea canaliculata* (the apple snail) that has placed a whole way of life at risk.

The Culture in Agriculture

Every staple food crop we know began as a sacred food. When Polynesians arrived by canoe in the Hawaiian Islands around 300-700 AD, they brought with them a handful of plants essential to survival in unknown lands. Taro, or kalo, in Hawaiian, was one of these plants. Kalo is sacred in Hawaiian culture. Hawaiians trace their genealogy back to Haloa, the first born child of Wakea and Ho`ohokuikalani, daughter of Papa and Wakea. The child was still-born. Where it was buried, the kalo grew. This first child became the mano wai, the source of life, for the second child, also named Haloa, who was the progenitor of the Hawaiian people. Prior to the 19th century, wet and dry taro cultivation covered thousands of hectares across the islands and fed perhaps as many as a million people. Today, kalo is a minor market agricultural crop, but it remains the state's most important crop culturally. Many farmers continue to grow taro for cultural and spiritual reasons as much as for food or income.

The three largest taro growing valleys - Hanalei, Kaua`i; Waipi`o, Hawai`i, and Keana`e, Maui – whose lo`i have been in continual cultivation for hundreds of years, have been most severely impacted by the apple snail. Hanalei, in particular, provides the majority of taro for poi in the state (a $2.7 million industry). *Pomacea canaliculata* threatens to sever this cord of connection as it consumes the poi crop (a 10-12 month investment of time and labor) and places cultural practice, traditional taro varieties and livelihoods at risk.

story continued on page 3

Ken Hayes

Hanalei Valley, Kaua`i
Hawaii's largest poi producer

The Meaning Behind the NEWsletter

Names have always been of immense importance in Hawaiian culture. When we decided to create this newsletter, we consulted Sam Gon, Senior Scientist & Cultural Advisor for The Nature Conservancy, to guide us in the naming process. His first question was, "What is your vision for this publication?"

The answer begins with KISC's mission. As a committee committed to preventing the spread of invasive species, we hope that our work will act as a shield around Kaua`i's precious resources. We do not stand alone in this, and our newsletter can serve as a gathering place to share all of the amazing efforts dedicated towards protecting our native species from invasion. From the on-the-ground management in Kokee and the north shore helicopter surveys to the Port Allen Carijoa eradication and the Coqui cooperative project in Lawai, this newsletter will cover the span of invasive species issues. Indeed, invasive species know no boundaries.

In kind response to this vision, Sam suggested several names, all of which included *kia`i*, the Hawaiian word for guardian. Because our collective work ranges from mauka to makai, *kia`i moku,*(meaning island) seemed to best reflect the scope of efforts.

A year later, KISC is still feeling blessed...

Sabra Kauka & Keren Gundersen at KISC's new office blessing.

INSIDE THIS ISSUE

May this newsletter be a continued inspiration for all of us to stand as guardians of the island.

A'OHE HANA NUI KA ALU'IA
No task is too great, when done together.

OISC: Your Off-Island ISC Ohana

By Rachel Neville

If you are familiar with KISC, then you probably already know about the O`ahu Invasive Species Committee (OISC). We are sister organizations—both dedicated to protecting our islands from invasive pests. We cooperate with one another and with other state agencies who share our concerns.

Like KISC, OISC's top concern is miconia *(Miconia calvescens)*. Currently there are no mature stands of miconia trees on O`ahu, but our field crew still finds keiki miconia in the places where mature trees once fruited. During the middle of January, our field crew visited the main infestation site and pulled up 87 seedlings!

Our other target species differ slightly from KISC's. We also host an annual strategy meeting with our OISC advisory committee, made up of conservation, agriculture and health specialists. With so many invasive plants already on O`ahu, the most intensely trafficked island in the state, it is difficult to choose the "top ten most wanted". This means that it is imperative to use our resources efficiently in order to achieve the most positive impact. OISC's advisory committee helps us choose our target species based on their potential for invasiveness and feasibility of eradication.

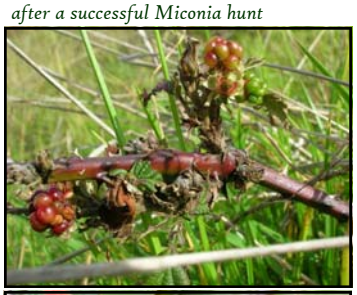
Aside from miconia, our target species are Himalayan blackberry *(Rubus discolor)*, bush beardgrass *(Schizachyrium condensatum)*, fountain grass *(Pennisetum setaceum)*, fire tree *(Morella faya)*, pampas grass *(Cortaderia jubata and C. selloana)*, smoke bush *(Buddleia madagascariensis)*, fireweed *(Senecio madagascariensis)* and glory bush *(Tibouchina urvilleana)*. The only vertebrate target is the coqui frog *(Eleutherodactylus coqui)*.

OISC's primary goal is to eradicate these species, or in some cases, to keep them confined to a specific location. For example, although the fire-hazardous plant fountain grass is prevalent in Diamond Head and Lanikai, it does not occur in the dryer, fire prone leeward part of the island. OISC's goal is to keep it out of the leeward part of the island, where it could cause severe damage.

The invasive species committees (we call each other the ISCs) on each island depend on the public to help us look for our target species and to call us immediately if they see a new arrival that shouldn't be here. Some of these new invaders can come from other islands, the mainland or even other countries. For example, Kaua`i residents should keep an eye out for mongoose, which are abundant on O`ahu, but are not highly established on Kaua`i. Similarly, OISC asks people who spend time in the forest to keep an eye out for banana poka, a plant that has already invaded Koke'e State Park but not yet found on O`ahu. Brown tree snakes might come from Guam and the red imported fire ant might come from the U.S. mainland. Invasive species is a big problem and all the ISCs need the public's help to keep them off our islands.

We on O`ahu are happy to know that Kaua`i has such an enthusiastic and effective team of weed warriors. Each island in our archipelago is unique and special and keeping them that way is a big job. Mahalo to KISC for guarding The Garden Island!

OISC's Joshua Fischer & Ryan Smith after a successful Miconia hunt



Forest & Kim Starr

Top to Bottom: Himalayan blackberry, glory bush, & smoke bush. 3 different species on OISC's "Top Ten Most Wanted"

KISC crew members Dave Neville & Amos Arashiro, showing us how ho`o mana nui is done

Ho'o mana nui

By Keren Gundersen

Ho`o mana nui. "Take it easy. Work with it." This Hawaiian expression, which is constantly being told to me by one of my co-workers, is one that has become my mantra. I have found it extremely helpful as I schedule projects, work with partners, agonize about sudden rain storms, or generally feel as if no one is sharing my sense of urgency. Working with what we have is essential in accomplishing anything; and we are currently blessed with so much. Never did I imagine that in a short three years KISC personnel would expand 600% and the budget would expand 300%! But, with exponential growth, comes the growing pains. I am happy to report, though, that overall, KISC is a growing, striving, enthused, and close family unit. I couldn't be prouder of every member of our crew and support staff.

Ho`o mana nui. Look around. Take a deep breath. See the beauty. And work with it.

Invasive Species and AgriCULTURE continued from page 1.

"THEY'LL EAT ALL THE TARO IN THE PATCH BEFORE IT CAN MATURE"

Gladys Kanoa, 4th Generation taro farmer, Keanae, Maui

About the apple snail

The apple snail is listed in the Global Invasive Species Database (http://www.issg.org/database/welcome/) among "One Hundred of the World's Worst Invasive Alien Species". It was introduced in the late 1980's, probably from the Philippines, as a local source of food and as a potential economic crop (exotic 'escargot' to gourmet restaurants both locally and overseas). Within a period of 20 years, *Pomacea canaliculata* has spread to wet taro-growing lands, ponds, ditches, and wetlands on five of the seven main Hawaiian Islands (O`ahu, Maui, Hawai`i, Kaua`i and Lana`i). Populations are highest in Hanalei. On Moloka`i, another species of apple snail (*Pila conica*) is present but damage from this species is minor compared to *Pomacea canaliculata*. Apple snail spread can be attributed primarily to purposeful or accidental human action, although once in a watershed, it will make its way downhill towards the ocean by natural water flows. Kaua`i is one island where deliberate dumping of snails in streams and taro areas has been documented. An adult apple snail produces thousands of bright pink eggs each year. They can breathe on land or under water, and can survive in the mud after a pond is drained for months, making them extremely difficult to eradicate.

Farmers indicate that crop losses of 18-25 % are typical, despite a range of control measures, including hand picking of eggs and snails, water level management, herding ducks, cleaning and inspecting taro huli (propagules) before planting, and using screens on irrigation canals and pipes. Ducks, in combination with other techniques have proven effective at reducing snail populations to levels where taro can still grow to maturity with limited damage. Without ducks, hand-picking becomes the primary mechanism for control; a time consuming, labor intensive practice that threatens to put farmers out of business.

There has been no scientific evaluation of the snail's impact to native biota (i.e. `o`opu) or stream-estuarian ecology in Hawai`i, but competition for space and food may be occurring. Snail densities in Hanalei have reached in the millions per acre. Farmers have reported the removal of hundreds of pounds of snails per month from their patches. Apple snails are even known to harbor diseases such as rat-lung worm (which can be transferred to humans) in Southeast Asia. Although no incident has been reported in Hawai`i to date, the potential risk is there. There are some communities in Hawai`i who may enjoy eating apple snails. Perhaps, it reminds them of similar foods in their home country. But, this is Hawai`i, a very unique and special place. If we value the gift of living here, we also need to protect this place, and the culture, that shelters us.

Ken Hayes

Top: Plenty of pink eggs
Middle: Close-up shot of the pest
Bottom: Attacking the taro

What can YOU do to HELP?

- A statewide survey was conducted in 2004 to determine where the snail has spread. Help to keep it from spreading further. If you have been in a taro patch that has apple snails, clean your feet, boots and tools carefully (newly hatched snails are very small), along with the wheels of your vehicle if it has been near the patches.
- A single farmer, on his own, can't control the snail; its takes a whole community to reduce snail populations below dangerous levels.
- Don't take huli from taro patches with apple snails to plant in areas not yet infested.
- It is illegal to transport live snails from one island to another or to dump apple snails in any open freshwater source. If you see someone dumping apple snails in uninfested areas (especially streams) report it to the new statewide Pest Hotline 643-PEST (643-7378).
- Choose not to eat apple snails or accept them as a product in the market or restaurants.
- Ask your legislators to support funding for apple snail control and invasive species prevention.

Prevention Station: West Nile Virus Watch

By Maile Sakamoto

Spring on the mainland brings warmer weather, and the mosquitoes that have lain dormant over the cold season. So why should Hawai`i care? Certain mosquitoes are capable of transmitting West Nile Virus (WNV), a potentially serious illness that affects mainly humans, birds and horses. Since arriving in New York in 1999, WNV has spread rapidly across the nation, and has now been found in all of the continental United States. The primary way WNV is spread is when a mosquito bites an infected bird, then, the infected mosquito bites and transmits the virus to humans, or other birds and animals.

Since 1999, nearly 20,000 human cases (and over 750 deaths) have been reported to the Center for Disease Control. Because of our 2000-mile protective ocean border, Hawai` has remained free of the virus so far, but we need to stay vigilant to ensure that it doesn't hitch an overseas ride here. Hawai`i needs to be especially concerned because our tropical climate hosts a year-round mosquito season. With our lifestyle and economy being so dependent on a safe outdoor environment, the impacts of WNV on Hawai`i could be devastating.

Worldwide, mosquito-transmitted diseases kill more people than any other single factor. Malaria alone kills over a million people every year. Mosquitoes also carry yellow fever, dengue fever, and several types of encephalitis (brain inflammation). The Department of Health (DOH) and other government agencies are working to keep WNV and other mosquito diseases out of Hawai`i with a constant surveillance effort around airports and harbors, and a plan for rapid response if the disease is detected. The public can help to reduce mosquito breeding areas around the home by eliminating areas of standing water. Dead birds may also be an indicator of WNV, so the public can play an important part by reporting dead birds to the Department of Health.

For more information about West Nile Virus, check out the DOH website at: www.hawaii.gov/health

If you find a dead bird on Kaua`i, please drop it off at Vector Control, Department of Health or Call # 241-3306

Bob Nishek and Alison Koepfgen volunteer often to pull Kahili ginger from the Alakai ginger outlier sites such as Drinking Glass and Waialae Cabin, hoping to keep it from spreading all the way to Waialeale.

2005 YCC volunteers Carrie, Amber and Linnea pause to admire the native lily Painiu, while removing kahili ginger and strawberry guava from native forest in Koke`e.

What's Up in Kokee?

By Katie Cassel & Bud Soria

Hui o Laka's Koke'e Resource Conservation Program (KRCP) is a collaborative project providing protective management of native forest ecosystems on the Koke'e plateau in northwest Kaua'i. It was founded in 1998 by the nonprofit Hui o Laka in cooperation with the Hawai'i Department of Land & Natural Resources State Parks Division. KRCP staff recruits and coordinates volunteers to greatly increase the amount of work that can be done.

Now in its ninth year, KRCP has four full-time staff working and supervising volunteers to remove non-native invasive species that threaten the magnificent native ecosystems that are unique in the world. With about 10,000 hours per year of volunteer time, in the last eight years KRCP has weeded over 4,000 acres (including repeat acres) and treated over 6,000,000 weeds. Target alien plants include strawberry guava, kahili ginger, privet, and blackberry.

Volunteering with KRCP is a great way to help preserve the biodiversity of this unique region. Volunteers are provided:

- Education about Hawai'i's special ecology
- A chance to experience rare native plant communities unique on Earth, and meet people from all over Hawai'i and the world who love these upland forests
- Rustic group housing at the historic CCC camp available by reservation.

This ecologically rich area harbors not only culturally important plants such as maile and mokihana, but also 50% of Kaua`i's rare plants, including 26 Threatened & Endangered species and an additional 31 rare plant taxa. Volunteer help is needed to save selected areas of our fragile mountain environment.

KRCP is funded by Hawai`i Community Foundation, Cooke Foundation, Hawai`i Tourism Authority, U.S. Forest Service, U.S. Fish & Wildlife Service, National Fish & Wildlife Foundation, and other private donors.

The Alakai ginger defensible line project is a partnership among the Kauai Watershed Alliance, the Nature Conservancy, KISC and KRCP.

To volunteer please call Koke'e Museum at 808-335-9975 or email us at krcp@aloha.net

Remembering the Makai side of things...a look underwater

DAR Forms New Rapid Response Team

By Sara Peleteri

The threat of invasive species to Hawai`i's terrestrial ecosystems has long been recognized because the changes and effects are often quite evident. Threats to our marine environment, however, have escaped such attention in the past, as problems beneath the surface can be more elusive. Last year, the need for greater concentration on this issue was realized, which propelled the Hawai`i Invasive Species Council (HISC) to fund the formation of the Aquatic Invasive Species (AIS) Response Team.

The mission of the AIS Team is to provide a more coordinated and rapid response to newly discovered populations of potentially invasive aquatic species, as well as supplying extra manpower to manage more firmly established populations. Managed under the auspices of Hawaii Department of Land & Natural Resources/Division of Aquatic Resources (DAR), the team consists of a supervisor, three technicians and an Americorps intern on O`ahu, as well as a monitoring specialist and technician on the Big Island.

Invasive algae have been a big priority for the team in 2005, and will continue to be for 2006. In partnership with the University of Hawai`i and The Nature Conservancy, the AIS Team helps operate a large vacuum pump on Kaneohe Bay. Dubbed "The Supersucker," the vacuum is capable of removing up to 750 lbs. of the invasive algae *Gracilaria salicornia* per hour. *G. salicornia* endangers patch reefs in Kaneohe Bay by forming large mats that smother coral and drive away native fish and invertebrates. Researchers, working in conjunction with the AIS Team, are studying whether the Supersucker can remove enough of these large mats of algae, so that native algae grazers such as urchins and certain types of reef fish can keep the invasive algae growth in check. Included in this cooperative project are local taro farmers, who help to recycle the removed algae by drying it and using it on their taro fields as fertilizer.

In 2006, plans are to operate the vacuum more often and to test it out on other types of invasive algae, such as *Kappaphycus sp.* The AIS Team also helps out with volunteer community-based algae cleanups on the south shore of O`ahu, organized by the Coordinating Group on Alien Pest Species (CGAPS).

The two team members, who are based in Hilo, will be focusing their efforts on surveying the distribution of invasive algae around the Big Island, as well as developing a state-wide monitoring plan that can help find new populations of non-native aquatic organisms before they can become established.

One of the biggest projects undertaken so far by the team has been an attempt to eradicate the invasive soft coral *Carijoa riisei* ("snowflake coral") from the island of Kaua`i. Research indicates that this soft coral may pose a threat to Hawai`i's native black coral beds and while it is prevalent on most of the other major Hawaiian Islands, the population on Kaua` is confined to the pilings of a commercial pier at the harbor of Port Allen. This project is a massive undertaking, involving many divers from UH, NOAA, DAR as well as the AIS Team and help from the Kauai Invasive Species Council. If DAR and the AIS Team can geographically eradicate the species from Kaua`, it may help to keep it out of the ecologically valuable and vulnerable Northwestern Hawaiian Islands.

The AIS Team is in the process of eradicating an intentionally-introducted corallimorph, *Actinodoscus nummiformis*. Corallimorphs are popular in the aquarium trade throughout the country; however, these organisms are illegal to posses in the State of Hawai`i. This organism was illegally introduced in State waters sometime before 1997 and has since become established at the site of introduction. Over the course of several months, the AIS Team has suppressed the vast majority of this population and is now in the process of monitoring the area periodically to ensure that the population has in fact been eradicated.

As a newly formed team, the members are all very excited about their mission to protect Hawaiian ecosystems. Americorps intern Katlyn McCoy who moved here from North Carolina to accept this internship says, **"I am really excited about being in such a beautiful, diverse environment and having the opportunity to really make a difference with my job."**

Counter clockwise from upper left: *Carijoa riseii*, AIS team member Shawn Fugimoto (left) at an alien algae cleanup, volunteers bringing thousands of pounds of invasive species (such as *Gracilaria salicornia)*, and AIS diver using "The Supersucker"

KISC Initiates an Early Detection Program

By Kristin Hall

REPORT INVADERS
643-PEST

KISC's weed warriors are looking to prevent future battles through a new Early Detection Program. As a pilot project, we plan to see the program through many phases. The initial phase of the project is already underway, resulting in a KISC Prevention Field Guide. Information was gathered for the guide's content by referencing existing lists from the other ISCs, who have also been developing similar programs, as well as the HEAR and PIER websites. The KISC crew will use the field guide to aid them in spotting invasive species, which are new to Kaua`i. KISC is planning on conducting monthly surveys for target species, in order to strengthen our prevention and rapid response strategies. These surveys will concentrate on areas of entry, such as ports, nurseries, and botanical gardens. If anyone has a plant of suspected interest or a suggested survey area, please email kristinhall@hawaiiantel.net.

Check it out!
www.hear.org
www.pier.org

With a grant from the Hawai`i Invasive Species Council (HISC), Maui has implemented public workshops to train the community on species detection and prevention (project website: http://pbin.nbii.gov/reportapest/maui/). KISC's Early Detection Program will continue to expand, offering such workshops in the future. With all eyes on the lookout, those new pests better watch out!

"Invasives aren't like other forms of pollution, they don't stop spreading when you stop releasing them. They grow."

National Geographic Magazine

Vouching for the Forest: *Making collections makes a difference*

WHAT IS A VOUCHER? A collected and preserved dried plant specimen, which documents the presence of an identified species at a particular place and time.

Top Ten Reasons to Collect Vouchers

1. We have a local herbarium! (Kaua`i's National Tropical Botanical Gardens has thousands and thousands of specimens from the Hawaiian Islands, the Pacific, and around the world)
2. Learn more about plant identification
3. Vouchers are an important reference for scientific studies
4. Contribute to the 3 billion specimens preserved worldwide
5. Vouchers give us an inventory of our local plant resources
6. Vouchers can help us to positively identify a new invasive species on Kaua`i
7. Vouchers keep track of native species locations
8. Vouchers are a great representation of biodiversity
9. Natural history collections are the best tangible record we have of life on Planet Earth-past and present
10. Collecting vouchers makes you a valuable part of conservation efforts

5 Steps to collect a voucher

1. Select healthy, fertile plants (if small, collect whole-if large, collect branches with flower, fruit, stem & leaves)
2. **Place specimen between folded newsprint**
3. Fill out the voucher collection form in your field notes, giving careful description
4. **Take photos!**
5. Submit to NTBG herbarium (tflynn@ntbg.org)

With references to "Good Botanical Practices: Collecting & Vouchering Botanical Specimens," David Lorence, NTBG

KISC crew supervisor, Kristin Hall, checking out NTBG's herbarium

Tim Flynn, KISC chairperson & curator of NTBG's herbarium, teaching staff from KISC, HDOA, & DOFAW on how to properly collect vouchers

KAUA`I VOUCHER FORM

Collector Name/s _____ Date_____
_____
_____

Location (General area & specific place name)
_____

UTM coordinates (GPS) X_____ Y_____

Site Description (Vegetation type & dominant species)
_____
_____

Plant Description_____
Flower_____Fruit_____ Form_____

Additional Information (note color, shape, & fragrances that may change)

KISC's Spring MVP-Most Valuable Partner
Hawaii Department of Agriculture

KISC's Joseph Aguon-Kona & HDOA's Eric Garcia at one of the long thorn kiawe work sites; one of KISC's toughest targets

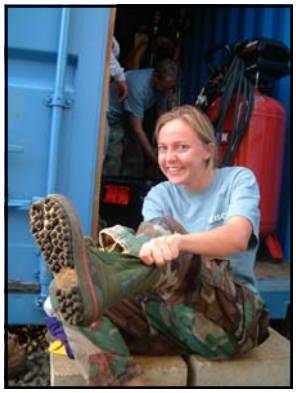
This issue's Most Valuable Partner (MVP) recognition goes out to the Hawaii Department of Agriculture's Craig Kaneshige and Eric Garcia. Not only has HDOA been instrumental in KISC's start-up and continual rapid response efforts, but have become weekly participants in controlling shared targets. Recently, KISC assisted HDOA with surveying for Little Fire Ant in Kalihiwai, laying out vials with spam and collecting spatial data. Craig and Eric also have been working along side the crew on other targets such as Long Thorn Kiawe, Fountain Grass, Miconia and Coqui Frogs. Their added experience and positive working attitude are deeply appreciated. Mahalo nui for all the hard work they do.

KISC's Dave Neville giving HDOA's Craig Kaneshige a helping hand after Craig & Eric contributed to another cooperative project.

E Komo Mai to KISC's Newest Additions

YOUTH conservation CORPS

AMERICORPS NATIONAL SERVICE



LEHUA PREVETZ-LAFAYETTE

Born: Kealia, Big Island

Least Favorite Invasive: Miconia

Why conservation? I love Hawaii, and I don't want to see it taken over

Hobbies: surfing, surfing & surfing. If surf no good, hiking.

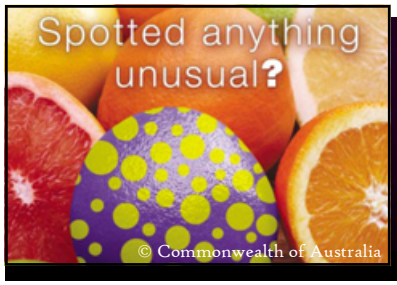
JONATHAN TACATA

Born: Waimea, Kauai

Least Favorite Invasive: Long Thorn Kiawe

Why conservation? I want to work outdoors and help take care of the islands

Hobbies: hiking, cruising, & water sports



NEW TOLL-FREE PEST HOTLINE!!!

If you see a Pest, don't Rest, call **643-PEST (7378)**

KAUA'I Conservation Conference

FIRST ANNUAL KAUAI CONSERVATION CONFERENCE

FRIDAY MAY, 12 2006 8AM-4PM ALOHA BEACH RESORT

For information: Kauai_conservation@hawaiiantel.net

KAUA'I Conservation Conference

KISC KAUAI INVASIVE SPECIES COMMITTEE

The Kauai Invasive Species Committee (KISC) *is a voluntary partnership of government, private and non-profit organizations, and concerned individuals working to prevent, control, or eliminate the most threatening invasive plant and animal species in order to preserve Kauai's native biodiversity and minimize adverse ecological, economic and social impacts.*

www.kauaiisc.org

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