



# ZERO WASTE REVOLUTION

**2015-2016 School Year**

## **MONTHLY REPORT • AUGUST**

*Rather than wait until the end of the year to summarize the continuing saga of Lanikai School's Zero Waste Revolution, we decided that **monthly reports** will document our process in more detail and be more useful to those who wish to evaluate the value of our project and learn from our experience.*

### **Building on last year's base**

Last year, the basic waste management infrastructure was set in place. We established a cafeteria Separation Station, campus-wide collection via Sort-It-Out Sam, and productive vermicomposting operations with the worm colonies of Big Blue and the Mulberry Gang. We collected and processed tons of paper, cardboard, and green waste. By adding five hot compost piles and two bokashi units, we were able to recover a total of 5,921 pounds of food waste – by February we could claim 100% landfill diversion. We learned about pyrolytic decomposition and produced a sample batch of biochar. Six pioneering 5th grade **Zero Heroes** tested out all our waste processing student activities and academic lessons.



### **Moving forward**

This year, we want to expand and improve in each of these areas. In addition for 2015-2016, there are two major steps forward we plan to achieve:

The first is to appropriately integrate everyone within our sphere of influence – staff, students, parents and the larger community – into the Zero Waste philosophy and daily practices through further development of waste-based curriculum and outreach.

The second is to complete the circle: this year we will be using our very own recovered resources to grow our gardens, enrich our landscaping, rehabilitate our depleted schoolyard, conduct original scientific comparison trials, and establish a revenue stream from sales of surplus products.

Our goals are equally educationally focused, environmentally progressive, and economically sound.

### **In preparation of July 29th opening...**

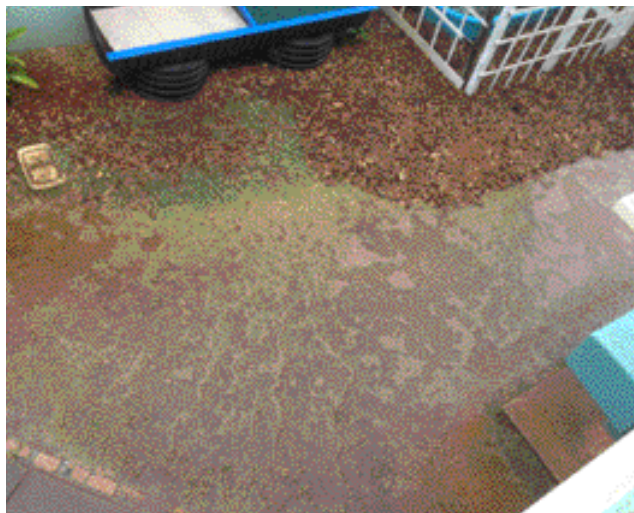
Over the 7-week summer break, compost piles were attended to and worms were fed and watered. The five Mulberry Gang bins were harvested a bit early in June in order to synchronize with Big Blue's cycle. That harvest yielded 240 pounds of high-quality vermicast.

### **Sample area sheet mulched**

Prior to the opening of school, we sheet mulched the most deteriorated portion of the front schoolyard, the first step in rebuilding the soil in preparation for new turf. Sheet mulching repurposed the bountiful amount of cardboard waste generated by the campus all year, which was piled clear up to the ceiling of the Resource Recovery Room – moving it took several truckloads! Within a few months, it will all break down into soil.



Only a small area of the schoolyard was covered at this time because of several concerns expressed by administration and parents about mulch: that it would draw centipedes, flies, rats, termites, and ants; that it would stink, and that children would catch splinters in their feet walking across it in slippahs.



### **Flooding following rain seals the deal!**

Our sample section performed beautifully—none of the imagined fears manifested during the first month of school. When we experienced torrential rains due to nearby tropical storms in late August, the mulched area absorbed the excess moisture perfectly while the rest of the schoolyard turned into a flooded, muddy, eroding, ugly mess. Mr. Noh gave us permission to mulch the rest of the property ASAP.

## 6th graders staff Separation Stations

Our lunchtime Separation Stations were ready to go the very first day of school. This year both Kindergarten and 1st grade split from the crowd to eat on two lanais near their classrooms in the LC (Learning Center). They operate their own Separation Stations, sorting food waste and milk, and stacking trays, bowls, and cups. After lunch, that day's Zero Hero team exchanges the full buckets for empties and picks up the trays.

After much experimenting last year, we settled on assigning as lunch waste monitors two 6th grade volunteers to fulfill a Zero Hero Service requirement. The term is one week – five days. On the 6th day, the old team trains the new team, as well as assists in hot composting part of that week's accumulated waste.

Instead of playing at recess and enjoying their own lunch among their classmates, the Zero Hero team sets up tables, positions buckets and rubbish can properly, cleans out and relocates the cafeteria Sort-it-Out Sam, monitors the sorting activity, collects buckets from the LC, breaks down the station, compacts, ties up, and delivers the trash to the dumpster, replaces the liners, weighs and logs food and milk data, and washes buckets.

Either Mr. Sawyer or Ms. Mindy supervises daily, since Separation Station dovetails with the exacting functions of food service and custodial, and has no room for inevitable kid-level mistakes. We were surprised at the basic life skills these kids lack on Day One – simple things such as opening and closing the legs of a fold-up table, wringing out a wet rag to wipe down a surface, or figuring out how to conserve the amount of hot water and soap it takes to scrub out a bucket and still get it clean. By Day Five, with a bit of experience, they are experts.

At the end of their stint, Mr. Sawyer evaluates the team verbally in front of the class, points out strengths and weaknesses, and invites discussion and comment. Although they each get a coupon for a Keiki Meal at Teddy's Bigger Burgers as a bonus, almost every student expresses great satisfaction in learning to do this important, complex task and being a part of the whole operation.

Every member of our two 6th grade classes will serve during the first and second trimester. In the third trimester, 5th graders will take over to finish out the school year.



*A full bucket can weigh up to 30 pounds.*





## Single-use disposable lunch trays banished!

### One Love Cafe steps up

One of our long-term goals was to acquire a dishwasher so that we could discontinue single-use food service items. A parent who did the research was very discouraged by the daunting obstacles, regulations, and expensive upgrades that it would require.

Meanwhile, **Shannon Walker**, our beloved One Love Cafe caterer and Lanikai parent, took the initiative to get the ball rolling. This past summer she opened her own commercial kitchen so it was possible for her to pack out the plastic trays and wash them in accordance with state sanitation regulations.

She started bringing in some plastic lunchroom trays she owned. There were not enough for everyone, but we used them up daily before we switched to the cardboard trays. She figured what she saved on purchasing cardboard trays (14¢ each) would compensate her to wash them.

By mid-August, Shannon had purchased enough additional washable trays to service everyone in the lunch program. ***Lanikai became the first public school in Hawaii that does NOT fill dumpsters with single-use trays!***

While this arrangement is likely not duplicable at other schools and is only a temporary solution, it is a BRILLIANT solution, and hats off to Shannon! It is amazing not to have big stacks of trays in the rubbish. Last year at this time, every lunch generated five 32-gallon rubbish cans filled to overflowing. We do not even fill one rubbish can halfway now.

### Let's help finance this idea further

To help move this wonderful idea another step forward quickly, it has been suggested to the LSO that they find funding to pay for – or split the cost



*Shannon Walker of One Love Cafe made a business decision to move Lanikai forward on the Zero Waste journey by replacing disposables with reusable plastic trays.*



*Bamboo utensil kits from Plastic-Free Hawaii were a prize for creating a mural from bottle caps – one was issued to every student and staff member. They were soon misplaced and forgotten. It would be better for One Love to provide metal or washable plastic utensils.*

of – other reusable food service items including bowls, boats, cups, and utensils. What Shannon will save on endless purchasing of disposables goes into her pocket for the extra labor she provides. And we have less rubbish to contribute to the dumpster, forever.

The change we have to adjust to is collecting these items – bussing trays and other food service item back to the cafeteria from the LC, Teachers’ Lounge, and wherever else people wander away to eat lunch. We are so used to disposing of everything in a nearby rubbish can. It will take some re-conditioning, but the elimination of single-use food service items is a huge milestone and ***WE CAN DO IT!***

## **2nd graders care for Big Blue**

Students in both 2nd grade classes were recruited right away for their Zero Hero Service, which includes assisting with the harvest of the Big Blue worm bin and daily watering of the worms.

### **First Big Blue harvest**

The bin was bursting at the seams and due for a harvest as soon as the school year got underway. On August 3rd, the brand new 2nd graders courageously dug in. Even though it was their first time ever, they enthusiastically picked out all the stray worms from 220 pounds of vermicast within a couple of hours



Our total vermicast harvest – Lanikai’s first – yielded 460 pounds. Two hundred pounds was sold for \$3/pound to the AINA program and will be distributed to 14 other schools to enrich their garden soil. The rest will be used for Lanikai’s gardens and schoolyard restoration project, brewed as a tea to infuse biochar, and applied as a foliar spray and soil drench. The next harvest will be in February. We will likely have enough surplus vermicast to share with others.

*Vermicast harvest yields 460 pounds.  
Lunch waste makes a lot of valuable  
vermicast at Lanikai School!*



### **Worm Waterers**

Two 2nd graders are assigned from the two classrooms to be Worm Waterers for one week. Each room has their own hose key and nozzle. They have to attach the nozzle, turn on the water, water the worms properly, squirt off the outside of the bin, turn off the water, detach the nozzle, neatly coil the hose and return the equipment. Second graders are perfect for this job and they take it very seriously.



### **Creature Features**

Since they are fearless and curious, second graders are treated to a series of 45-minute lessons covering the various invertebrates of the decomposer ecosystem. The August Creature Feature focused on worms, of course, and both classes had a session handling and observing the three kinds worms at Lanikai: *Eisenia* and *Perionyx*, the composting worms who live in our bin, eating and pooping all day, and *Amyntas*, the big muscular garden worm who works hard to aerate the soil. Students looked at special anatomical features such as segments, clitellum and prostomium, noting how they compare and contrast, and how a worm’s body type reflects its specialized task.





## 4th graders harvest hot compost

Although our five compost piles from last year's food waste collection are not officially due for harvesting until November, we wanted some of our own compost to build the LC garden beds at our Garden Party (work day) on August 15. We decided to harvest Pink, the original hot compost pile.

Fourth graders were chosen to perform this physically challenging Zero Hero Service, and we tested two sample teams – one from each class – to see how it would go. They all completed the introductory AINA course in composting in 3rd grade, so they had a basic idea how decomposition works and were familiar with the millipedes, isopods, blatterians, and other critters they would encounter. We anticipated no screaming and freaking out over bugs.

The procedure is for two shovelers to drop the finished material on a 1/4" screen, where four screeners rub it over the surface until all the compost particles pass through and land into 10-gallon Sterilite boxes. Any big pieces left on the surface are swept off the side. When four boxes are filled, you replace them with four empty ones and keep going.

The 4th graders were fantastic with enough focus, strength, and stamina to pull it off. They traded shoveling and screening positions every few minutes, and jammed for 20 minutes before they ran out of steam. This was plenty of time to fill eight boxes. One team did half the pile one day; the other team finished off the next day. We got a total of 17 boxes (approx 1-1/2 cubic yards) of beautiful compost in less than one hour! In pairs, they carried and placed the heavy full boxes under the nearby trailer for storage.

This initial batch from Pink was used partially for the LC gardens; the remainder will be added to the 4th grade garden plot as amendment for the September planting.

Fourth graders will continue harvest our compost piles all year long one-by-one as they mature. We'll have plenty rich, finished compost from Yellow, Turquoise, Purple and Green for the January re-planting, and plenty for other uses around the campus.



## Sort-It-Out Sam hits his stride

### Sam Sessions in every classroom pay off

The very first week of school, Ms. Mindy spent 20-30 minutes in every single classroom discussing in depth the intricacies of using Sort-It-Out Sam properly. It was worth the time and trouble as correct Sam usage improved far above last year. End of the day collection of recyclables via assigned Sort-It-Out Samurai also fell into place smoothly, with most teachers assigning this task as a class job for one week. Ms. Espie goes around with a sign to remind everyone a few minutes before end-of-school which also helps compliance. Our average daily take with Sam is ten pounds of food, eighteen cans/bottles, and an inch stack of paper. This adds up – the 1,800 pounds of snack waste we retrieve via Sams during a year is enough to make three hot compost piles!



### Add Cafeteria Sam, relocate Playground Sam

One more Sam unit was added on duty outside the cafeteria, whose job is to handle morning assembly and after school recyclables. The Sam formerly on the 1st grade lanai was relocated to behind the LC near the playground, where he picks up recess snacks. Our total Sam count is now twelve – this is probably the limit. Sams replaced eleven 32-gallon rubbish cans.

### Upgrades, signage

All seven of the ground floor Sams got wheels, and some modifications were added to the lids to discourage dumping regular rubbish. The Sort-It-Out Sam Collection Station acquired a nice sandwich sign with a white board area to communicate special important messages.

### In five weeks of school, only one liner change!

In the first month of school, July 29 through August 31, there were 22 days with kids on campus. Because all of Sam's belly waste was inert – plastic or foil – there was no need to change the liners for the entire month. Only one was replaced over the duration, making a total of only 13 corn-polymer biodegradable liners used during this period. Total weight of 22 days of belly waste was 19 pounds, pictured here.

In the same 22 days of last year, prior to the Zero Waste Revolution with no Sams on duty, 264 non-degradable plastic liners were disposed of, enough to fill several dumpsters.





### **Sam is high maintenance, but truly earns his keep**

The Sort-It-Out Sam program represents considerable financial investment, time, energy, and diligence, but the ability to collect a significant amount of food waste, paper for worm bedding, and HI-5s for recycling from every corner of the campus every day is essential. The reduction in plastic that Sam achieves is monumental. The change in behavior that comes from daily, thoughtful participation in recycling – the kuleana of every member of the school community – is what creates the Zero Waste values and campus culture we strive to build.

## **Finishing up old projects; gearing up for new ones**

### **Mini-Bin harvest, office bin upgrade**

The original 5th grade Zero Hero group from last year made up Mini-Bins to take home and care for, and these worm colonies were due for harvesting early in August. The entire 6th grade class pitched in for the harvest. Although none



*School Director Mr. Ed Noh and Business Manager Callie Lewis adopt abandoned worms.*

of the little colonies thrived, all survived and produced several handfuls of decent vermi-



cast. As predicted, kids at this age make it clear that they are totally bored by worms. Only one student kept her colony at the insistence her mother, who loved the idea of vermicomposting at home. All other worm colonies were contributed back to the school and added to the office bin, a new purple Worm HangOut. The office staff is enthusiastically caring for this indoor colony, feeding them their own snacks and food waste brought from home.

### **Kindergarteners meet the wormies**

Both classes of brand new Lanikai Learners got a classroom lesson on worms and a hands-on tour of Big Blue. The little kids run their own Separation Station on the lanai where they eat lunch, so now they understand why we separate our food – to feed our wiggly worms and make vermicast for our garden. In September they will start creating worm bin bedding as their Zero Hero Service.



### Science beds installed

As part of the Biochar Project, students will be comparing different soil mixes to see if there is an increase in productivity when plants are grown in biochar-amended soil. There was some discussion about building separate science beds apart from the AINA gardens for these experiments. The solution was to install three 5-foot diameter HDPE pipe remnants – rescued from the landfill – into the hillside by the compost piles. These are basically giant, durable planters that can be easily accessed, set up with beds that can be split in a number of ways – plus they look very cool! A couple of



dads who came out to help at the Garden Party dug them into the hillside and leveled them. The cost (\$300, plus \$75 to rent a jackhammer with spade attachment) was covered by school funds.

### Garden prep

Much weeding and puttering around the AINA beds happened in August. In accordance with sustainable/organic gardening practices, six of the eight beds were planted with a variety of nitrogen-fixing cover crops over the summer. These plants were chopped down and covered with a layer of cardboard egg flats to allow the “green manure” to break down. In one bed, over 200 pounds of bokashi pre-compost was buried and the surface covered with mulch.



*August additions: Compost piles  
Vermilion and Blue plus three  
circular Science Beds.*

In the final bed, several boxes of compost from last year’s pile Pink will be worked into the soil. Handfuls of our own vermicast will be mixed in during the planting operation. Which beds will do the best? They will probably all be spectacular! We can hardly wait for the gardening to begin...

## High level of financial support assures success

### **The Wind Beneath Our Wings...**

Lanikai's Zero Waste Revolution is made possible by the generous gift of Steve and Marilyn Katzman, funds that support full-time professional project management by Mindy Jaffe of Waikiki Worm Company. *Mahalo!!!*

### **Recycling Koaniani Fund monies**

Lanikai requested to "recycle" a portion of the Koaniani Fund grant from Oahu Resource Conservation and Development Council. This money was originally awarded by Hawaii Community Foundation to Pearl City High School to purchase Max, the trusty utility cart. Max was retired after Pearl City's operation shut down and has been housed by the staff at Oahu Urban Garden Center since December. In August, Max was sold to our good friends at Ho'omau Ke Ola in Waianae to use on their farm. One thousand dollars was returned to ORC&D and awarded to Lanikai to purchase a System10 Compost tea brewer, a backpack sprayer, and a good supply of tea catalyst.



### **Lanikai is awarded a \$1,000 national grant!**

Assuming it would be a long shot because hundreds of schools apply from all over the country, Lanikai applied for a \$1,000 grant called *2015 Look at Agriculture... Organically!* from the California Foundation for Agriculture in the Classroom. The project was entitled "Biochar" and detailed how we would produce biochar and test it. We were one of the 24 projects selected! The money came in late August and we will use it to build a biochar cooker. This has given us confidence that we can compete on a national level for attention and support.

### **Other grants submitted**

We submitted a grant for \$15,000 from Hawaii Community Foundation to make a video of our Zero Waste operation, sheperded for us by Josh Stanbro, Environment and Sustainability Program Director of HCF. Our fingers are crossed.

We applied for the \$5,000 Cooke Foundation Beautification Award. The Lanikai 2014 beautification project was our art installation that doubles as a living, breathing, ever-changing, compost pile array, which we believe is a fine example of Earth Art. We will know in December if the Cooke Foundation Committee agrees.



## **Bottom line for August 2015**

This report covers the interval between July 29 and August 31, 2015. There were 22 days of school during this period. Food waste diversion was 100%, including lunches, snacks, and food waste generated at special events.

- Total food waste composted was **1,935** pounds via vermicomposting, hot composting, and bokashi fermentation.
- 100% of all HI-5 cans and bottles were collected and redeemed.
- Approximately 80% of all paper and cardboard was collected and processed.
- Approximately 90% of all green waste was collected and processed.

In this short amount of time, we also made extraordinary progress with our goals of expanding all our programs, integrating operations activities into curriculum, preparing to close the circle, and reaching out to the school ohana and greater community.

## **Coming up in September**

- Our AINA garden plots will be planted!!! AINA In Schools program begins at Lanikai starting September 14th.
- Our biochar cooker will be delivered and we will start to produce biochar
- We will begin to use our new compost tea brewer and sprayer to produce and apply compost tea.
- Bokashi operation will get underway with a new site; 5th graders will produce bokashi inoculate as their Zero Hero Service
- First grade and Kindergarten will begin creating worm bin bedding as their Zero Hero Service
- Six graders will prep Science Beds for biochar comparison field trials.
- We will send a group of 6th grade students to Aikahi Elementary and LeJardin Academy to conduct food waste audits as part of the Trash Trek initiative, per their request for assistance.
- We will host tours of our operation for several schools who have inquired including Kailua Intermediate School, Aikahi Elementary, Le Jardin Academy and Hawaii Baptist Academy High School