



Counting Your Community's Household Trash

Details for using the Household Test Method for a waste characterization/assessment

I. Setting Up

Distributing bags to households: Distribute garbage bags to households that you think will be willing to participate. Try as much as possible to get a range of household "types". What might work is to get the TC staff to participate. But also try to include households that do not have paid employment jobs. They might have a different wastestream - such as less consumer items, more total wastes if they spend more time at home, or less total wastes if they spend a lot of time doing subsistence. Think about household sizes. If most of your households are large extended families, then try to get several of these to participate.



Back to School Another way to incorporate community education with your assessment is to go to the school. Make a presentation at an assembly or a classroom that talks about how important getting accurate waste numbers is, and explain the method. You'll be able to get student volunteers right there to sign their families up, and you might get some volunteers to help you count the trash.

NOTE: If you rely on this method, **you'll get a good representation of households** in your community. But do you have many households of elders or adults that live alone, or without kids? They are likely to have a different wastestream. So if there are several, try to get at least one of these households to take part. Also, if you get teachers to volunteer - make sure that you note whether their wastestream is likely to be representative of the community. In many of our Villages, the teachers live a different lifestyle. Because they are a small part of the population, you would not want more than one teacher household to participate (unless they live a similar lifestyle to most everyone else).

Your Objective: The objective is to have the households use special garbage bags for all of the trash they produce for one full week. You will pick up the bags at the end of the week, or you can arrange for the bags to be dropped off.

You will need to get enough households to participate, or the assessment might not be accurate. You can use the table below to estimate the number of households needed:

If your community has:	You need this many households to participate:
20 or less households	Try for half, but at least 5 households
Between 20 and 50 households	Try for at 10 –15, but at least 7 households
Between 50 and 100 households	Try for 15 – 20, but at least 10 households
Between 100 and 150 households	Try for 20 – 30, but at least 15 households
Between 150 and 200 households	Try for 25 – 40, but at least 18 households





Plan for Drop-Outs: From our experience, you can expect about half of the households to forget to use the bags, decide it is too much trouble, or not understand what the instructions. If you get more households completing the study than you need, you can always throw away the extra garbage.

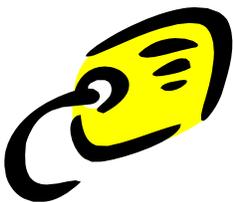


Delivery: It is best if you drop off your bags to the households all on the same day. That way you can ask them all to start that night. People are more likely to remember if they start right away. They can continue using the bags through the final morning. Do you have a lot of households to deliver the bags to, and go over the instructions with? You can "deliver and talk" over two days. It is important to spend enough time with each household to visit, **have them realize how helpful to the community they are being**, and how to use the bags. Keep track of which households are in the first-day set and which are in the second-day set.

How Many People Were Really in the Household? Be sure to find out how many people stayed at that household during the study week. You need to **know how many people the trash bags represent**. You don't need to get too exact. If a 5 person household had a guest for about half of the time, you would count that as 5 and one-half (5.5 people). If a 5 person household had a guest for only one dinner, just count it as 5 people. As long as you get the number as close as you can, the study numbers will be fine.



Weekday/Weekend: If community life is pretty much the same on the weekends as the weekdays, then you can stop after 5 days. If your community mostly observes the weekend (i.e. lots of 9 to 5 office- or school- type workers), it is best to have the study go for 7 days. People who have paid employment tend to have very different waste habits on their days off. Either way, it is critical to **make sure the households know when to start their study and when to end it**. Some households will tire of this study after a few days. If they end early, that is okay. **They (and you) just need to record how long they participated.**



Labeling the Bags: Give each of the households 2-3 garbage bags. **People can be concerned about sharing their trash.** So you can **number** the bags, instead of label them with their names. On a separate sheet, write down the bag number, which household you gave it to, and how many people in the household for the study week. Keep the sheet in a safe place where others don't have access.

One bag should be used for **Food Waste** that normally goes to trash can only, one bag for **Other Trash** going to the trash can, one bag for trash can **Bathroom/medical wastes** that go to the trash can produced during those 5 days. The "Other Trash" bags should be the big





30-gallon size type. The "Food Waste" bags should be the 12 - 15 gallon size. The bathroom/medical wastes can be a small size (to discourage diapers!). **If people are planning on at-home subsistence preparation** that week, give them separate 30-gal bags labeled "**Subsistence prep**" for their wastes if they normally bring it to the dump. IF they feed it to their dogs or bring it back out to the land, they should do that.

The reason why you separate food waste is that it will be easier to measure when it is in its own bag, and it's a lot less messy! Examples of food waste are: Food scraps from subsistence of store-bought meals, Fish waste, or solid fats or bones from individual meals. Subsistence preparation wastes are for people who are preparing subsistence fish, game, berries, plants for the year (not for an individual meal). So there would be a lot of bones, fish scraps, etc.

You will need to label the bags. Masking tape works fine. Write "Food Waste " on half the bags and "Other Trash" on the other half of the bags. Take some bags labeled "Subsistence prep wastes" if any study households do in-town preparation and it is that time of the season.

Remember - you are trying to figure out how much trash goes to your dump and needs a management plan. So only have people put into these bags what they would normally put into the trash or bring out to the dump. If you are interested in how much food is composted or fed to dogs or other uses, that is something different.

For larger households (over 4), give them two "Other Trash" bags.

For example, for Household #1, you'll give them a bag labeled "Food Waste #1" and a bag or bags labeled "Other Wastes #1". For Household #2, you'll give them bags labeled "Food Waste #2" and "Other Wastes #2".

Bathroom/Medical/Illness Wastes: These are things like loose Kleenex, toilet paper, band-aids, etc. **Toilet paper** should be *only* included if it is normally thrown out in the wastebasket. These wastes are separated because they pose a small threat if you come into contact with them of spreading illness.

Tell people to be sure to secure their "bathroom" wastes tightly

Diapers: For households with infants and toddlers, tell them they to **please throw these wastes out in another garbage bag**. Tell them to try to "keep score" of how many diapers they threw out, and then write it down. Otherwise, we all know about how many diapers babies need, and about how many babies are in our Villages. There is a more accurate way of estimating diaper wastes. BE sure to remind people of this, or you will end up with diapers in almost all of your trash bags. You might want to supply folks with trash bags just for diapers so they don't mistakenly throw the diapers somewhere else.





Natural Reuse/Recycling: You want to find out what is going to your dump or being burned in barrels in town. All wastes (except diapers, large or very heavy wastes, and dangerous items) should go in the bags. The exception is for wastes that already are being "recycled" or "reused" in useful ways. These wastes should be used as normal. For example:

- ❖ Subsistence wastes that are **not** discarded at the dump,
- ❖ **Food scraps used for feeding dogs** or other pets,
- ❖ Food scraps for composting.

However, for conventional **recyclables** - like aluminum cans, cardboard, etc., **make sure those wastes are counted**. If people already recycle cans, ask them to place them in the bags and let them know you will recycle them when the waste assessment is finished. If they want to keep them, just count them when you pick the bags up, or have them write down their can count. You want to know the full potential for recycling in your community.

Large Wastes: If an object people are throwing away is too big or heavy to fit in the bags, tell them to write it down on the "Instructions Form" and throw the object away as usual. These wastes are generally a different type of waste category called "special wastes", anyway. They include items such as lumber, vehicle batteries (hopefully brought to a backhaul program), appliances, computers, furniture, etc. The "Instructions Form" can be given to the households when you drop off the bags. Note, if you have a battery backhaul or computer backhaul you add to the Instructions form.



Yard Wastes: Most Villages don't have yards, but more are getting lawn mowers and weed-whackers to keep down the mosquitoes. If any of the study households have brush or lawn clippings that they would normally bring to the dump, give them a separate 30-gal bag for that, or tell them to write down on the Instructions form that they brought the "yard wastes" to the dump, and have them estimate how many bags worth they brought.

Dangerous Items: It is unlikely that people will throw medical needles into the bags, but needles or sharp shards should not be placed into the bags. These should be discarded separately. Dog carcasses are also dangerous because of disease transmission and should not be placed into the bags. Cracked household batteries can be dangerous as well. If the waste is not embarrassing to the family, such as a broken jar or household battery, have the family wrap it in paper and plastic bag, and label what it is. That way it can be safely counted and weighed (e.g. as a glass bottle or a battery). Regular light bulbs should be wrapped in paper, labeled, and placed in the "Other Trash" bag.



You are not likely to get any **fluorescent light bulbs** in the five days of this study, but please note to the families that **they can be dangerous** if they break due to the mercury vapor that





can escape. If your community does not yet have a fluorescent light bulb recycle program, please tell the family to be very careful, wrap it for cushioning, label it clearly and then discard it separately at the dump where it will not get broken or burned. As a better alternative, you can collect the fluorescent bulbs and bring them to the office or school storage closet. That way, you will have started your fluorescent recycling program (see <http://www.zendergroup.org/ewaste.htm> for instructions).

Bag Pickup: At the end of the 5 (or 7) days, collect all of the bags. Or you can ensure that participants bring their bags to an assigned location (like the dump, an empty lot, or a big, warm room). If you delivered the bags over two days, then you would pick up the second set of household bags the day after you pick up the first set. From our experience, it is best to wait and count all the bags in one day. But you are the judge. With a lot of help it can go pretty quickly. If you are by yourself, it will be one very long day.



II. Counting Trash!

Find a Tarp: If you have a tarp, spread it out on the ground. If not, buy or find one. It will help in organizing your bags, keeping the ground/floor clean, and cleaning up later.

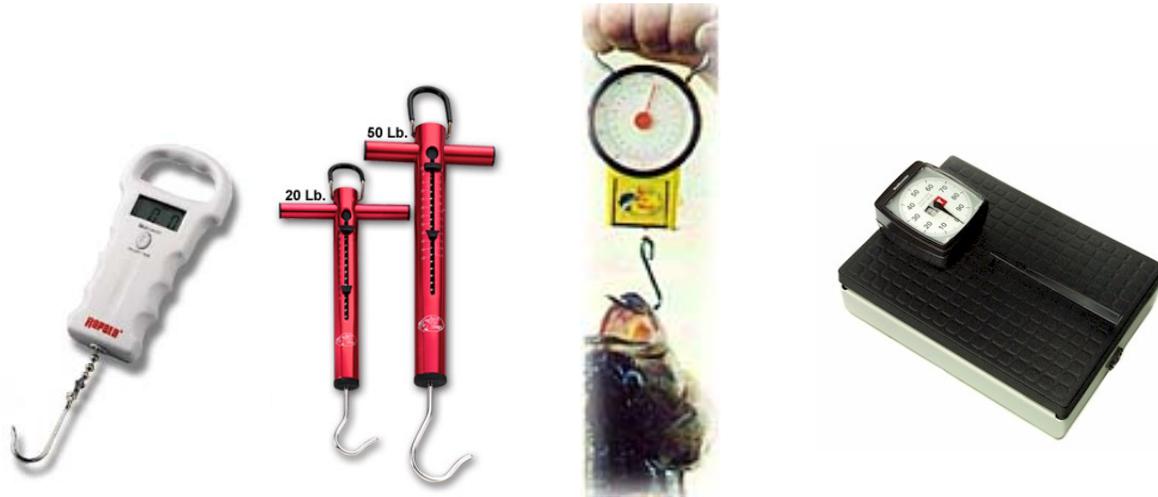
Find a Bag Holder: When weighing the different types of trash, it is easiest to place what you are weighing into a trash bag *with ties or drawstrings*, or a sturdy duffel/shopping bag *with handles*, to hang the bags on the hook on the scale. Find something suitable and bring it with you.

Find a Scale: If possible, ask around to see if you can borrow one. A fish weighing scale will work. You don't need anything fancy. Here are some pictures of example scales to use. These are just examples. Any scale you can find will probably be fine. Scales that you can place the bags on work really well! If you are lucky enough to have a clinic-type weight scale that you can use, that can work best. But trust us, it is very difficult to convince the clinic that weighing dirty trash on their scale is a good idea.....



Using a scale to weigh trash components





Examples of scales

Bring a Yardstick and Tape Measure: You'll find lots of uses. If you can't weigh it, you can measure it and calculate the weight later!

Get Geared Up: When you work with garbage, you should wear heavy boots, gloves, a mask, and goggles or eye/sun glasses. If you perform your work at the dumpsite, please be sure to wear all of this protection. **Also, please be sure you are up-to-date on your tetanus shot.** It is very easy to puncture your foot on a rusty nail that will go right through a normal shoe. We have seen it happen. Something can also fly into your eyes when walking in a dump. Work-gloves with rubber glove liners work best. Bring a couple of pairs of the rubber gloves. You can get a basic mask from the clinic. Wear clothes that you don't mind getting dirty or torn.

Rather than the dumpsite, we recommend "pleading" with the school or community/tribal building/public works to use their non-carpeted room. It is warmer in the winter, less buggy in the summer, drier, safer, and a bit easier to organize. After it is over, you will need to take the counted garbage to the dump, and you'll have to clean up your mess, but it is usually worth it.

Once you start the study, it is actually pretty interesting. Don't tell anyone, or soon you'll have the whole community helping you out....



Waste characterization carried out in Aleutians, AK

Method Summary: If you look on the "Waste Characterization" data sheet, you will see "Name of Household" on the first line. Fill this in, so each household has their own column. Then fill in number of people in each household and the total number of days people used the trash bags. Note the number of bags per household and the bag size (gallons). Take the first household's "Food Wastes" bag. Weigh and record it. Then weigh and record the total weight of the "Other Waste" bag(s). These numbers will give you the **total weight of all trash for the household**. If the household wrote down additional items on their sheet that they discarded, such as "large items", diapers, or "dangerous wastes", you will need to add the weight of these items, and mark the appropriate waste type in the sheet. Using the spreadsheet, you will then calculate the **total lbs per person per day of trash** for each household. Do this by dividing the total waste weight by the number of people and number of days. You can then take these numbers for each household and add them up. Then divide by the total number of households to get the **average number of lbs per person per day** of household trash in your community.



Waste characterization carried out in Bristol Bay Region, AK

Now it's time to record the **individual trash types** so you can see how much of each type is generated in your community. These numbers can be particularly helpful for determining recycling potential in your community. Go back to the "**Food Waste**" bag. Peer inside to see if there is anything unusual and to make sure that only food wastes or contaminated light-weight wrap/packaging is present. If there are a lot of contaminated food wrap/containers in the food bag, just count how many. There is a place on the spreadsheet to mark "contaminated plastic". You don't need to separate out the plastic wrap/bags/Styrofoam from the food, because they don't weigh very much compared with the food. Note that the contaminated wrap/plastic can be counted, then assigned an estimated weight. The weight of the food is the weight of the bag with the food in it. Note anything of interest in the "Food" Comments section (e.g. all fish scraps). Place the bag aside. You're done with it.

Next, take the "**Other Wastes**" bag(s) for the same household. Dump out the trash for easy viewing. With gloves, separate all the different types of trash into different piles. Put all the aluminum cans together, all the cardboard together, all the plastic together, etc. Then either weigh or count each of the waste categories. Record your numbers and comments.



Then clear the tarp, or push the wastes to one side so they don't get mixed in with the next bag. Repeat for each household.

For example, let's take the first category on the Waste Characterization form: **Paper**. Try to separate out all the types of paper (office paper, newspaper, cardboard, mixed paper etc.). Then weigh or count each of these different types. Contaminated paper is generally paper/cardboard that can't be recycled because it is either soaking wet or too contaminated with food, oil, etc. Note anything unusual about your paper wastes in the comments space. Weighing is the preferred assessment method for paper. If it is heavy because it is wet or full of food, the weight should be entered with food wastes.

To Weigh or to Count? The data tables were meant to be flexible. When you are "in the field" you will find it easier to count many waste types instead of the weight. Put the total number of items in the "count" column rather than the "weight" column. Then later, back at your desk, you can use the "count conversion" table to fill in the weights of each item into the table. For unusual objects, you may not be able to look up the weight, so you should weigh them if possible. If not possible, note the material type and measure it. Food wastes are definitely easier to weigh.



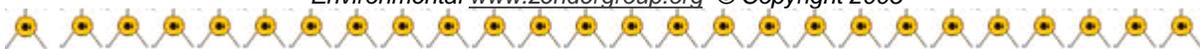
Details, Details! The categories in the data table are very detailed. You may find you don't want to get that detailed. So you can also "lump" all of the sub-types together. For example, just sort **all** of the paper wastes and weigh them together. Then you write the total weight of paper into the comment column where it says "Paper Total" If you use this approach, you can just check "✓" the subcategory if that type is present in the waste sample for that household. That way you can still have some details.



3. Wrapping it up and Some Things to Think about

Ugh, issues: You are sure to come up with some count/weight issues in your assessment. The main thing is to be consistent. And always write down what you did to address the issue. Even the best waste assessment methods will have at least a 10 percent error. So you really just need to be comfortable getting within about 20 percent of the actual volume/weight. In the end, you'll over-estimate some things and under-estimate others, but you will still get a much clearer picture of your community's wastestream than if you relied on a national average assessment.

Fractions can be useful after all: One of the techniques we have found handy is to allow for fraction counts. For example in the vehicle category, if it is a big dump, count 1 for a whole vehicle, 0.2 for big parts, 0.1 for small parts. (It helps to keep an actual tally - i.e. a mark for each one and then keep track of the fractions until they add up to one, and then mark another one).



Fraction counts can be good too for estimating the waste volume by estimating the number of garbage bags. We don't know whether people in your community use garbage bags much or not. But if most of the garbage is dumped in tied bags - you can get a great waste volume count by just counting bags. Then you would tally just $\frac{1}{2}$ for bags that are $\frac{3}{4}$ or less full. If most of the garbage is in bags, but some not, you can just count "equivalent bags".



Plastic - "the light waste": Plastic bags are much easier to count than weigh (without a micro-scale!). It is their number anyway, not their weight or volume (negligible) that is the waste management problem. Plastic containers also will not weigh much. You should count these, and then use the conversion table to determine the weight.

Big Wastes: For some larger items - like wood scrap or furniture - you can count it and then measure it with a yardstick - i.e. how much wood is there. So for a dresser that you can't use a weight scale with, you'd write down "dresser" in the furniture field. And then you would write down a lumber equivalent, like six 3 ft (2" by 6"s). An even easier method would be to bring a couple items that you know the weight of, say a 5 lb, 15 lb weight, and 30 lb item. Then you pick up the known weight(s), feel how heavy they are, and then pick up the dresser, and estimate its weight.



For other big wastes that aren't on the weight conversion table, you can call companies you know that sell those items to ask their approximate weights. For example, for a fridge, you can look up companies in your yellow pages under "refrigeration sales" to call. Note what you can about the fridge (for example, its approximate size, how old it is etc.) so you can give a description to the company you call. You can tell them you are working on a waste assessment for your community and you're just trying to get a ballpark weight for the item.

Important Wastes?: Some communities have certain waste types that might be important for them to know about. For example, if you are concerned that your kids are consuming too much pop or candy, you can separate out all the pop bottles, cans, and candy wrappers. You can count all of these up and take a picture. It can help with nutrition education later on. Again- you need to be careful about privacy issues. So make sure that people don't know which households the wastes are from.



Diapers Again: Don't forget to add the total estimated (full-throwaway) diaper weight for your community to your total estimated community weight. If you have a fast growing community, diapers can make up a significant portion of the waste weight.

In terms of disease transmission risks, diapers are about as bad as having honeybuckets in an open dump, so it is a good education tool for the community to realize the number of diapers that people might be contacting when they visit or salvage at the dump. Folks with babies can be more careful about how they wrap up their diapers.

How do I estimate the kinds of household trash that don't get thrown out very often - with just some paper and a pen? For estimating a variety of special wastes, including diapers, fluorescent bulbs, used oil, vehicles, batteries and much more, see <http://www.zendergroup.org/wastecount.htm>