# Final Report and Recommendations of the Regional Compost Working Group

Approved January 18, 2022

# Executive Summary

The Regional Compost Working Group (RCWG) has been a joint effort of the Town of Durham, Town of Lee, Oyster River Cooperative School District and University of New Hampshire. These four entities are connected by a history and focus on sustainability leadership, as well as by geography (i.e. UNH is located in Durham and many UNH students and staff/faculty live in Lee, ORCSD's students and many of its employees come from both towns as well). Each has various independent composting programs to reduce the amount of food waste being landfilled and incinerated. In late 2020 the four entities formed the RCWG to explore the potential for beneficial collaboration regarding these food waste diversion efforts, and to explore the feasibility of a regional compost facility that could accept food waste from each organization.

The RCWG undertook research to guide the planning of a potential compost program in the area. It compiled pre-existing data about each of the member entities' waste streams, existing food waste and composting programs, and–to the extent available–costs. It distributed a Community Sustainability Survey to businesses in Durham and Lee, and canvassed local food businesses. It also researched best practices in a handful of other New England communities, conducting interviews with municipal staff and with representatives from varied food waste diversion service providers. This, the RCWG's final report of conclusions and recommendations, is predicated on the research findings encapsulated in Waste Practices Research for the Town of Durham, Town of Lee, University of New Hampshire, and Oyster River School District. (Gross, 2021), which is referenced throughout.

After meeting for about a year, the RCWG concluded that a regional facility is not currently the best way to proceed. Reducing the amount of food wasted in the first place, and composting that waste at the point of generation, are ideal solutions in that they eliminate the need for outside organizational help. Accordingly, the RCWG recommends that its four member entities should prioritize continued education and support for reducing waste and for composting it on-site (i.e., at home or on campus).

In addition, the RCWG has concluded that collection programs that utilize commercial food waste pickup services, such as Mr. Fox, Agri-Cycle Energy and Garbage to Garden, are viable local options. These are easier to implement than an on-site composting operation; they may also prove economical, saving money compared to landfill or

incineration, at relatively small scales.

Each member organization has different concerns that make one unified solution difficult. The Town of Lee has no curbside trash pickup, while the Town of Durham offers both curbside pickup and transfer station dropoff.  It's common for Lee residents to regularly visit the Lee Transfer station. While Durham residents do use the Durham Transfer station, the majority of residents rely on curbside pickup. UNH receives recovered methane gas generated by organic waste at Waste Management's Turnkey landfill in Rochester for fuel, so the case for composting as a way to reduce the campus carbon footprint is not strong as it would be if the waste were going to a landfill without this methane capture; this is likewise true for the Town of Durham.  UNH also already composts the majority of institutionally-produced food waste (from all three dining halls) at a university-run facility, and presently sees more benefit in focusing on waste reduction than on expanded diversion programs. ORCSD, on the other hand, definitely wants to expand their diversion program beyond its cafeterias. Durham has many restaurants that each produce food waste, some that are already heavily engaged and others that are not. Lee has many farms that are potential feedstock sources, composting sites and compost users.

The four organizations can join forces in education efforts, in campaigns to reduce the amount of food waste discarded, in generating cost-benefit comparisons, and in approaching commercial food waste collectors. These are the next steps the committee is recommending to reduce the amount of food waste we pay to be landfilled or incinerated.

## 1A: Composition of the Regional Compost Working Group

The Regional Compost Working Group was formed in February 2021, comprising two members each from the Durham Integrated Waste Management Advisory Committee (IWMAC), Lee Sustainability Committee (LSC), Oyster River Cooperative School District (ORCSD) and University of New Hampshire Sustainability Institute. (Efforts to add Madbury representatives were unsuccessful.)

The members of the RCWG were:

- Jenn Andrews (Sustainability Project Director, UNH Sustainability Institute)
- Evy Ashburner (ORHS student from the Sustainability Club)
- Chuck Cox (Lee Sustainability Committee)
- Mary Caulfield (Durham Integrated Waste Management Advisory Committee)
- Chloe Gross (UNH student, UNH Sustainability Institute)
- Maggie Morrison (ORCSD Sustainability Coordinator)
- Nell Neal (Durham Integrated Waste Management Advisory Committee)
- Dean Rubine (Lee Sustainability Committee)

UNH, ORCSD, Lee and Durham representatives each operated within a hierarchy in their respective organizations. Lee and Durham members would act in accordance with the guidance of the LSC and IWMAC committees, seeking feedback from their respective elected town governments and administration as directed by those committees. The ORCSD Sustainability Coordinator reported to the ORCSD school board. The UNH Sustainability Project Director consulted with Sustainability Institute leadership and

members of UNH's Sustainability Task Force as needed; worked to embed a student researcher into the Working Group through UNH's Research, Experience and Apprentice Program (REAP); and ensured the survey and interview research protocols were reviewed and approved by the UNH IRB. The various hierarchies complicated and slowed the decision making of the RCWG, but by properly acting within them, the RCWG enjoyed enduring support of the four organizations.

## 1B: The Mission and Findings of the RCWG

The working group's formation was spurred by an initial idea that all four member entities might benefit economically and/or logistically from a shared regional compost facility. That facility–whether a new operation, or an expansion of an existing site such as the one at UNH's Kingman Farm–would collect food waste from across the region, employ staff or volunteers to process it, and create compost to be used by the entities. The original mission of the RCWG, then, was to make recommendations to the two towns, university and school district as to whether and how to proceed in that endeavor.

To this end, the working group sought to understand the following topics:

- Why we should compost or otherwise divert food waste
- Regulatory issues pertaining to municipal composting operations
- Existing food waste solutions in our organizations and in other communities

Information collection began informally, with the RCWG talking to an NH-DES official and assessing current and past efforts by the four organizations in the area of food waste and other waste streams to guide the planning of a potential compost program in the area. Then, under the direction of faculty advisor Jenn Andrews and the RCWG, UNH student Chloe Gross undertook formal research in summer 2021 to gather more information. Ms. Gross distributed a Community Sustainability Survey to businesses in Durham and Lee, canvassed local food businesses, and interviewed relevant personnel from existing food waste programs in other communities. Her research and report also aggregated preexisting data gathered by the RCWG about each member organization's waste handling programs, logistics and costs. (Gross, 2021).

What emerged from all of that research and resulting discussion were five key findings:

1. Composting is a valuable pursuit, but there are higher-value actions to be considered as part of a "food waste hierarchy;"

2. Composting regulations in NH may not be as significant a barrier as assumed;
3. There are multiple existing service providers that have been used cost-effectively by the member entities and other communities;
4. Businesses have a key role that needs to be considered and addressed separately;
5. The need for education to increase public participation in order to overcome a current lack of demand and awareness for existing programs to make expanded composting solutions feasible.

These findings, elaborated upon briefly in Section Two (and at length in Gross(2021)), caused the working group to expand its scope of exploration. The RCWG members enumerated, researched and evaluated a broad range of possible paths forward, outlined in Section Three. Finally the working group developed recommendations for future action, outlined in Section Four.

## 2A: Composting Benefits: As Part of the "Food Waste Hierarchy" and Community Climate Action Plans

The decomposition of organic food waste in a landfill releases methane, a potent greenhouse gas thirty times more effective than carbon dioxide at trapping heat in the atmosphere. Landfills are a significant source of human-related methane emissions; this is why the Global Covenant of Mayors includes food waste reduction as an important element of community climate action (Global Covenant of Mayors, n.d.), and many communities are including composting efforts in their climate action plans.

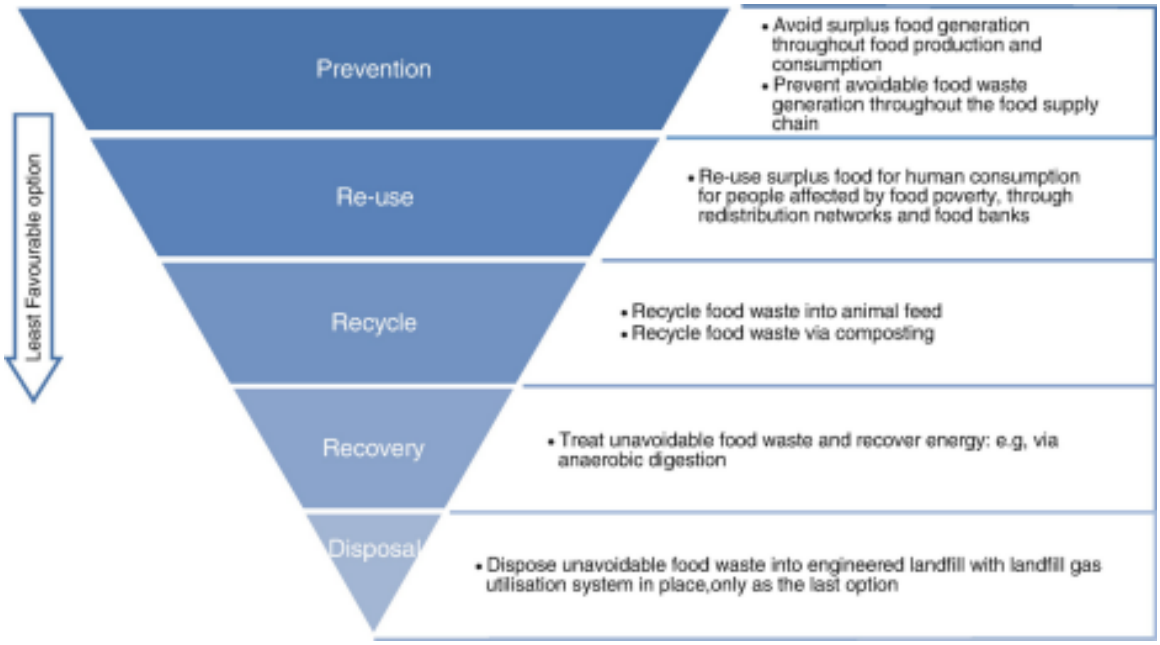
The landfilled food waste of the two towns and UNH ends up at Waste Management's Turnkey solid waste facility in Rochester, NH, where the methane is captured and piped back to UNH via their Ecoline system (University of New Hampshire, 2020). Similarly, ORCSD's waste is incinerated in a plant that creates low-emissions electricity for the New England grid. This is good news: it means that the problem of food waste-created methane has largely been addressed in the area.

There are, however, multiple reasons for Durham, Lee, UNH, and ORCSD to continue to engage with the issue of food waste. Agriculture is another significant driver of global climate change. Food items have an embedded carbon and nitrogen footprint even before they are consumed or disposed of. Minimizing food waste significantly reduces that "upstream" footprint. It is also an important way to help address food insecurity,

which research demonstrates is an ongoing local issue.

Moreover, turning back to the question of “downstream” benefits, composting replenishes topsoil, returning vital nutrients that would otherwise languish in landfills. It also reduces the need for synthetic fertilizer and pesticides.These benefits are especially relevant in farming towns like Lee and agriculture schools like UNH. The increasing scarcity and cost of landfill space is reason enough to reduce the amount of landfill trash. Lee’s small food waste composting program already saves a bit of money compared to tossing the food waste in the landfill trash, and landfill costs will likely rise in the future.

The following chart (Papargyropoulou et al., 2014) has been helpful in guiding the priorities of the RCWG. It confirms that composting food waste is preferable to disposing it in a landfill, even when landfill gas is captured for fuel. It also highlights the importance of prioritizing prevention and re-use as important precursors to composting.




## 2B: New Hampshire Composting Regulations and Logistics

For the last two decades or so, the general belief was that New Hampshire Department of Environmental Services (NH-DES) regulations made it difficult to permit a compost facility that processed meat and dairy. UNH’s composting operation at Kingman Farm in Madbury, used to sell and give away compost before being stopped by NH-DES

because of meat and dairy in the feedstock. In 2015, SB 251 sponsored by Senator Fuller-Clark was enacted into law. In summary, “this bill permits composting facilities to use meat and dairy products in their composting operations”.

SB 251 directed NH-DES to make changes to the regulations as required to implement this. But six years elapsed without any such changes ever proposed. In August 2021 another law was passed, HB 413, redirecting NH-DES to produce new regulations. Recently, on November 12, 2021, NH-DES proposed new rules that do indeed allow meat and dairy to be composted; the public comment period has recently ended (New Hampshire Department of Environmental Services, 2020).

The truth is a bit more nuanced than the general belief. For the past two decades it’s been the case that a Standard Permit (costing $2000-$5000 to file, generally for large facilities actively monitored by the state) allowed meat and dairy processing, while a Permit By Notification (free to file, for smaller facilities with no active state monitoring) required an additional waiver to process meat and dairy. In the past few years NH-DES communicated that they understood they were late with the changes and thus were generally disposed toward granting such waivers. So obtaining a Permit By Notification for a facility that processed meat and dairy wasn’t as much of an impediment to composting in NH as has generally been believed.

The bigger picture is that commercial composting is a complex endeavor requiring particular market conditions, investment and knowledge. While other parts of New England have laws that require food waste from high-volume producers (e.g. restaurants and grocery stores) to be kept out of landfills, New Hampshire does not, reducing the feedstock available to a local composter.

## 2C: Food Waste Diversion Service Providers for the Seacoast

The RCWG’s work to understand and document the existing efforts of its member entities and to explore solutions that have worked well in other communities highlighted that there are multiple existing commercial service providers with whom partnership might be productively explored before the RCWG would recommend taking on the project of an expanded or new regional compost facility. Mr. Fox, a commercial composting business is or has previously been a partner to all four members in their waste diversion efforts, is one. Agri-Cycle, a Maine-based biodigestion business, is

another that already services some Durham local organizations (including UNH). And Garbage to Garden is a third option, a commercial composting operation, which also has a track record of successful partnerships with communities in northern New England. Examples of how these companies are providing services to various communities is outlined in Ms. Gross's report (Gross, 2021) and a brief exploration of how they might be further leveraged by RCWG member entities is outlined in section 3B of this report.

## 2D: The Role of Businesses

The research and report by Ms. Gross gave special focus to businesses in the two towns, mainly restaurants and grocery stores, confirmed to be significant producers of food waste. While businesses account for a substantial fraction of the food waste generated within each town, there are obstacles to including them in future diversion initiatives. Respondents reported that they pay for private haulers to collect their trash and food waste. Since NH does not have a state law mandating the reduction of food waste by businesses, there is lack of motivation on behalf of businesses to do the additional work of diverting food waste. Those that do, it is based on either reducing their hauling costs or to engender customer goodwill. From a municipal perspective, it is economically undesirable for towns to process food waste of businesses currently utilizing private disposal. Therefore, while any comprehensive food waste diversion scheme should include businesses, at this time the RCWG has declined to make specific recommendations for businesses, beyond considering them in future planning and including them in any group discounts negotiated with vendors.

## 2E: The Need to Increase Awareness and Demand for Food Waste Solutions

There are very low levels of community and business awareness of the problem of and solutions to food waste. This includes the importance of minimizing it, and the value of diverting it through composting and biodigestion. This was a key takeaway from the RCWG's work to survey and canvass local businesses during the summer of 2021, as well to understand the current participation rates at costs of its member entities' existing food waste programs (see next section of report).

That lack of awareness means that the cost of existing programs (e.g., Durham's

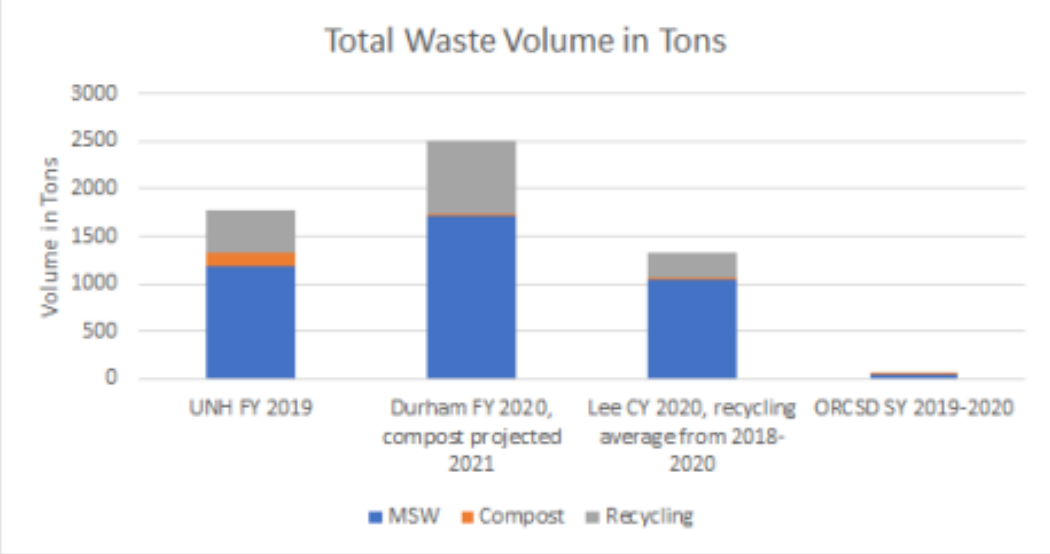
community compost pilot) is higher than it need be, and the potential cost savings of others are not being fully realized (Gross, 2021). This means that the environmental and social benefits of existing efforts are not being fully realized either. To heighten the value of existing programs and to lay the groundwork for any potential expansion of efforts, it is clear to the RCWG that the most important thing all four member entities can focus on is increased education and awareness raising about the problems and impacts associated with food waste, and the value of food waste minimization and diversion (i.e. composting) efforts.

## 3A: Existing Food Waste Programs

All four RCWG member organizations had made efforts to reduce and divert food waste. Understanding the scope, similarities, successes and constraints of those programs was an important part of the RCWG's work.

UNH has a composting facility at Kingman Farm that has been operating since the 1990s, where food waste from UNH dining halls is currently composted. UNH further collects food waste from its WildCat Stadium and a couple of dining retail locations on campus, which is picked up by Agri-Cycle Energy which processes it into biogas fuel.

For almost a decade, each school within the Oyster River Cooperative School District has been composting within its school cafeterias, using Mr. Fox. Efforts have expanded to include classroom composting within the elementary schools. A dedicated group of high school students are working to expand composting at the high school. In 2020, UNH Sustainability Fellow Kendall Gray completed a Greenhouse Gas Inventory Report on the school district (Gray et al., 2020). The district has since produced its Sustainability Management Plan (Oyster River Cooperative School District, 2021).



The above stacked bar chart shows how the current volumes of MSW (municipal solid waste destined for landfill or incineration), Compost, and Recycling waste from each organization compare to each other. Some data points are missing, such as ORCSD's recycling figures. From Gross(2021).

Lee has no trash curbside pickup; most residents bring their trash to the transfer station, though some private corporations offer curbside service. The award winning Lee Transfer Station has a many-streamed recycling model (Messeder & Lee Sustainability Committee, 2021); careful management by the staff and attentive residents minimize contamination, enabling Lee to get the best rates for its recycled material. Residents can bring their compost to the transfer station, where it is picked up by Mr Fox and composted at their facility in Eliot, Maine, Lee has also made some effort to get folks to compost at home, with a program around a decade ago through which the Lee transfer station sold inexpensive outdoor compost bins, with the idea that home composting is the best way to divert food waste from the landfill.

As a complement to the LSC's "One Bin at a Time" series of articles (Messeder & Lee Sustainability Committee, 2021) about disposal and recycling in Lee, the Lee Sustainability Committee has also implemented educational campaigns encouraging home composting. There is little data available to evaluate the success of these efforts.

In contrast to Lee, Durham has a curbside model. Typically Durham's residential food waste is collected curbside as trash or brought to the Transfer Station by residents where it is thrown in the trash to be delivered to Waste Management's Turnkey Landfill. A small amount is collected for composting by Mr. Fox.

Beyond direct food waste diversion, the various organizations had led efforts to educate the public on the importance of using less so as to not generate unnecessary waste.

## 3B: Possible Food Waste Solutions

Here we enumerate the various plans for diverting food waste out of the landfill stream considered by the RCWG. The list is based on Ms. Gross's research, where she contacted a number of existing communities and vendors practicing composting or other food waste diversion (Gross, 2021); please see that report for details.

The list below lays out programs in order of increasing scale. While they are listed separately below, they're not mutually exclusive by any means.

We believe that by pursuing some combination of these plans the member entities could achieve cost savings as well as environmental impact. As an example, the Town of Lee sends about a 1000 tons of waste to Turnkey landfill annually, paying around $80 per ton, including hauling. If 40% is food waste that's 400 tons or $32K in annual disposal costs for Lee. The Durham Compost Challenge measured 63% so 40% is conservative (Strafford County Regional Planning Commission, 2021). Lee's municipal compost program currently diverts an estimated 5% of the food waste that would otherwise be landfilled, and while we know that in practice no engagement campaign or diversion program will achieve 100% reductions, that leaves a significant amount of savings and environmental impact to be gained by the types of efforts outlined below.

## Plan 1) Education and Support of Food Waste Reduction and Home Composting

The ideal solution would be for everyone to eliminate avoidable food waste and then to compost the unavoidable waste (e.g. inedible items such as egg shells, coffee grounds, etc) on site. This avoids transporting food waste, with its associated financial and environmental costs. Durham and Lee, as well as UNH and ORCSD, could do additional/expanded education campaigns, perhaps backed up by some subsidized outdoor compost bins.

A basic cost-benefit analysis of such an approach, for example for Lee, would be as follows: estimate a bin costs $40 and the average household uses it to divert 50 pounds of food waste per month.The bins would pay for themselves (by reducing landfill costs) once half a ton is diverted, so 20 months. Assuming an (optimistic) 10% participation rate resulting from a successful education campaign, that's 160 Lee households, $6400 for bins, saving the town $4000 per year going forward, assuming they're all used. The nice thing about this approach is it's a one-time cost and the benefits continue indefinitely. The downside is that there would be a limit to how many residents or campus users are able to compost on site.

## Plan 2) Commercial Curbside Pickup

This is another alternative that creates ease of access for residential and commercial curbside composting. Mr. Fox quoted residential biweekly pickup service at $16/month per site while Garbage to Garden picks up weekly for $15/month. Agri-Cycle does not provide residential curbside pickup (Regional Compost Working Group, November 15 2021 minutes). In this situation, residents or organizations would contract directly with the vendor, keeping the town out of the loop, except perhaps to negotiate a group discount. A benefit of this configuration is that it may increase participation. Food waste that never makes it to the transfer station saves the town money, so there may be some possibility for subsidies here as well. In the Lee example, $32K amortized over 1600 households suggests a $20 per household annual subsidy is about the break-even point for the town.

## Plan 3) Compost Bins Around Town

The idea would be to have neighborhood bins, perhaps with a nearby neighbor assigned to each bin who's responsible for maintenance and rewarded with finished compost. Each bin would be in a publicly accessible spot where neighbors could bring their food waste. Again an education campaign would be required to get participation up. The goal would be to increase participation above that of plan one alone, allowing an option for neighbors unable or unwilling to compost on their own land. The composting would be done in the bins; the town would be largely out of the loop.

There are examples of communities having some success with this approach. Disadvantages include more likely contamination of the communal bin, and the possibility of pests, including bears.

## Plan 4) Food Waste Collection Bins Around Town

This plan places secure food waste collection bins in central locations in town in addition to the bins at the transfer station. The additional bins increase the possibility that more residents would participate, separating their food waste from their landfill trash and depositing it in the convenient bins. Participants of Durham's Compost Challenge have requested such bins.

In this plan, a town would contract with a food-waste collection vendor, much as they do now. In one instantiation the additional bins would be purchased by the town. The town would collect the food waste from the bins and bring it to the transfer station where the vendor would pick it up as before. This may be preferable in Lee, where current management by the public works director ensures that the bins are filled to the brim before they are picked up by Mr. Fox, keeping disposal costs competitive with landfill rates. Alternatively, a vendor such as Mr. Fox, Agri-Cycle or Garbage to Gardens could be responsible for pickup, periodically collecting directly from the bins around town.

## Plan 5) Continued Collection at the Transfer Station

This plan continues what is being done now in both towns, but we would include a component of education to increase participation. Mr. Fox would still process the collected waste. The goal would be to divert enough food waste to the point where it economically makes sense to compost locally. Attempting this plan as a starting point seems to have significant potential benefits and little potential downside.

One way to increase the amount collected is for a single facility to accept food waste from Lee, Durham and the schools. The issue of transportation of the waste looms large. Initially, we'd increase Mr. Fox's business but eventually we'd end our relationship with Mr. Fox, in essence becoming a competitor. Like Mr. Fox, we'd have to charge for the waste we take to offset our costs. Success hinges on being able to offset costs while charging a competitive rate.

## Plan 6) Table to Farm

This is an idea where the organizations collect food waste that is forwarded to local farmers for composting. This has the advantage that many local farmers are already composting, and the ordeal of a municipality permitting and operating a compost facility is avoided. This idea is mostly applicable in Lee, with its many farms, some of which have already indicated their willingness to provide feedstock for composting, accept feedstock for composting, and/or accept finished compost. Many farmers we spoke to had the concern that contamination of feedstock would render the resulting compost toxic to crops, e.g. by composting grass clippings with persistent herbicides (Dillon, 2013). That concern can be alleviated by bioassays -- verifying the finished compost supports plant growth.

### Plan 7) ORCA - The Oyster River Composting Association

This was the “big idea” at the start of the RCWG process, a joint effort by the four member entities to create a composting site that accepts inputs from all. The issue of transporting food waste remains the sticking point. While the two schools could probably arrange to deliver food waste to the site, Durham’s curbside model presents a significant challenge. We include the possibility of Lee or Durham setting up a municipal compost operation in this plan as well.

UNH’s Kingman Farm seems like an appropriate site, but they are a research facility and can’t risk bringing in significantly contaminated feedstock to compost that will be spread on Kingman Farm fields. Also, space for expansion could prove a significant constraint. So in addition to the other challenges, we’d have to find a site and a way to staff it. The proposed changes to the NH composting regulations will determine which sites are allowable (New Hampshire Department of Environmental Services, 2020).

## 4: Recommendations of the RCWG

While the committee is not recommending a joint food waste diversion program at this time, we are recommending ways to combine our efforts going forward, and to be prepared when opportunities for regional cooperation present themselves.

What the RCWG discovered is that it wasn't just the regulations that make municipal scale composting challenging. Operating a composting facility is a complex endeavor, requiring collection and decontamination of multiple feedstocks, careful management of the compost process, and testing and retailing finished compost. There are competitive alternatives, mostly commercial companies that will pick up food waste, that are much easier to implement.

The RCWG identified that community education will be an essential component of expanding community composting programs. Data from the Community Sustainability Survey (Gross, 2021) indicated that although there is ample enthusiasm for composting and other environmental initiatives, there is hesitancy in adopting green changes for fear of social and economic impacts on businesses, lack of knowledge about water conservation, energy conservation, or composting, and the ease of transition. The RCWG highly recommends sustainability education campaigns prior to and during the

expansion of composting efforts for all four entities. General sustainability education should continue to be included in each organization's community outreach (such as the "Did You Know" section of the Durham Weekly Updates e-newsletter), but a targeted campaign for compost education would greatly benefit each community's program.

This type of education work could be an opportunity for collaboration. All four groups could share education materials and information while each taking specific segments that would benefit their audience. Sustainability Interns and Marketing students from UNH could work with the towns to create informative and engaging campaigns with the towns. These students could also collaborate with ORCSD students for outreach and Sustainability Club activities.

Overall, the recommendations of the RCWG are that all four organizations should continue their current composting programs while looking into ways to streamline and expand them. Additionally, collaborative compost education campaigns should be initiated to increase public knowledge about composting and generate enthusiasm for community composting participation. The committee recommends the following actions to each of its member organizations.

## Joint Regional Food Waste Reduction Recommendations:

1. Education - food waste awareness, behavior modifications, composting alternatives, focus on McSweeney's 5D's: Discover, Define, Design, Develop, Deploy (McSweeney, 2019, page 9).
2. Town/UNH/ORCSD Liaisons - continue communication among interest groups.
3. Collaborate on providing workshops and a campaign for Food Waste Reduction.

## UNH Recommendations

Improvements in waste minimization and diversion are essential to UNH's sustainability efforts, which are part of both the University's values and its strategic priorities. To that end, this research suggests the following as important next steps for UNH in advancing its "zero-waste" (ZW) efforts.

1. Educational/outreach campaign about reducing consumption and encouraging reuse (waste management hierarchy concepts)
2. Strategic waste audits to assess amounts of compostable material in trash and

contamination in recycling to aid targeted campaigns
3. Work with Sustainability Task Force to put together a roadmap for Zero Waste Planning and Implementation
4. Hire a ZW coordinator
5. Meet with COLSA to determine staffing at Kingman, interest in collaboration/ expansion of UNH compost efforts
6. Work with outreach and communications interns to develop a strategically-paced composting/recycling/ZW campaign that is distributed on all platforms synchronously with coordinating events
7. Continue to support Durham and Lee, and ORCSD if applicable, in work with Sustainability Fellow/s which may incorporate ZW and/or outreach

## Durham Recommendations

Durham is part of the Global Covenant of Mayors for Climate and Energy. This is a coalition of city leaders addressing climate change by pledging to cut greenhouse emissions and prepare for the future impacts of climate change. Up until this point Durham's participation in the coalition has focused primarily on energy use. The RCWG strongly recommends that Durham broaden its focus to include municipal solid waste (MSW) - specifically the composting of food waste.

Why compost? Because ....

Food waste in landfills is a heavy contributor to environmentally harmful methane gas emissions. We are fortunate that at present methane from the Turnkey Landfill, where our MSW is sent, is captured and piped to UNH as a heat source. While methane is certainly an important part of the food waste climate picture, it is not the only concern. Food waste is also the heaviest part of municipal waste. Rubicon, a leading provider of cloud-based waste and recycling solutions for businesses, governments and organizations worldwide, tells us that on average 24.1 percent of all MSW is food waste. We know that at our transfer station 5.62% of the 493.03 tons of MSW collected in 2021 was collected as compost. Factor in the 1146.83 tons of MSW collected curbside, of which none is composted, and it is easy to see that diverting food waste to compost would result in a potentially sizable savings to the Department of Public Works line item in Durham's annual budget. Another compelling reason to remove food waste from the waste stream is the ever shrinking landfill availability for receiving our waste. Some

states are having to close landfills. Others have refused to accept food in their MSW. Turnkey accepts MSW from Massachusetts because of their shrinking space. Currently there are two bills coming up in house committees addressing landfill concerns. HB 1420 prohibits the issuance of new landfill permits until the state's solid waste plan is updated. HB 1049 establishing a committee to study landfill siting criteria and methods for reducing pressure on landfill capacity.

Why compost? Because....

Composted food waste is a valuable nutrient rich resource. Topsoil of farms and home gardens is being lost and is in trouble. There are not many ways of replenishing it. The top 12 inches of earth is the site of valuable organic activity and benefits - filtering air and water, managing pollution and flooding, sequestering carbon and regulating the climate. Composting turns food waste into valuable nutrient rich soil. Composting has environmental and economic benefits that are far superior to having organic material in landfills.

Below find a range of recommendations in no particular order from the RCWG for moving forward with a composting initiative in Durham, NH.

1. The Durham Department of Public Works (DPW) and Administration establish an MSW Food Scrap Reduction goal and provide a means for achieving that goal to be reflected in the 2023 budget.
2. Explore options for a residential curbside town-wide compost pick-up service.
3. DPW locates pick-up sites in addition to the transfer station, within downtown and/or residential sites, for community compost collection.
4. Engage Durham Businesses, Great Bay Rotary and landlords in the town-wide compost discussion.
5. Continue informational Did You Knows (DYK) in the Friday Updates.
6. Town Drive for indoor kitchen compost pails and at cost outdoor compost bins.
7. Periodically present quantitative food waste and MSW data at town meetings.
8. DPW opens communication with Lee, NH regarding the possibility of a regional composting location and sharing of related expenses. Durham and Lee bring their respective Agriculture Commissions into the discussion.
9. Durham launches an education program designed to change food disposal behaviors and bring residents on board involving relevant departments, committees and commissions.

10. Incorporate a composting initiative into a wider 'Community Sustainability Plan'. Such a plan would describe the community's vision for a sustainable future and would propose goals, objectives, targets and strategies to achieve that vision possibly under the umbrella of the Global Covenant of Mayors for Climate and Energy.

## Lee Recommendations

The most beneficial result to the town is if food waste never reaches the transfer station at all. We should redouble our efforts encouraging home composting and wasting less food in the first place. Furthermore, Lee has many farms, which often are producers of organic waste, have onsite composting operations, and use compost in their farming. We should explore Table to Farm, an idea to divert organic waste to local farms and away from the landfill and perhaps even the transfer station.

Here are our recommendations for Lee.

1. Continued education and support for the reduction of food waste in general.
2. Continued education and support to increase the number of households composting at home.
3. Continued education and support to increase the number of households separating food waste for collection at the transfer station rather than ending up in the landfill.
4. Explore alternatives to Mr. Fox, namely Agricycle Energy and Garbage To Garden, especially in collaboration with the other organizations in the RCWG.
5. Explore Table To Farm, where we find Lee Farms that want our municipal food waste rather than paying Mr. Fox to have it hauled to Maine.
6. Firm up the details of a municipal compost operation in Lee. How much area do we have at the transfer station? Is it enough according to the rules, or do we need another site? How much would it cost to operate? Currently this is estimated at ¼ to ½ of a full time employee for staffing, plus some capital equipment and ongoing costs for operations. The proposed regulations, once finalized, have significant decontamination, monitoring and testing components, all of which impose costs on such an operation.
7. Collect data to determine:
    - The number of Lee households and businesses utilizing private trash

disposal.
    - The number of Lee households that compost at home.
    - The number of Lee households bring food waste for composting to the transfer station.
    - The amount of food waste being collected.
    - The amount of food waste that ends up as landfill trash.
    - The amount of yard waste collected, as well as a determination if it would be suitable as compost feedstock.
8. Periodically present quantitative food waste data in town meetings and the E-Crier.

### ORCSD Recommendations

1. Educational campaign across grade levels
2. Explore educational videos produced by high school students. Video to be shown during snack time at elementary schools, and advisory time at middle school and high school
3. Work collaboratively with high school and middle school faculty to employ a school wide food waste audit, to include school kitchens.
4. Audits to inform next steps for each school. Engage students to develop solutions and strategies

## 5: Conclusion

The RCWG explored ways the Oyster River region can reduce the food waste that ends up in landfills or incinerated. The recommendations mainly focus on continuing education to reduce food waste in the solid waste stream and increase food scrap composting at home/on-site or through the available programs. The RCWG recommends continuing utilization of the competitive commercial food waste pickup alternatives available.  Another focus of the recommendations is data collection. Finally, we urge the four organizations, Durham, Lee, ORCSD and UNH, to continue to collaborate on the issue.

# 6: References


Dillon, J. (2013, May 30). Year-long Investigation Finds Chemical Herbicide In Compost. *Vermont Public Radio*. https://www.vpr.org/vpr-news/2013-05-30/year-long-investigation-finds-chemical-herbicide-in-compost

Global Covenant of Mayors. (n.d.). Retrieved December 4, 2021, from https://www.globalcovenantofmayors.org/

Gray, K., Lichtenwalner, S., & Oyster River Cooperative School District. (2020, December). *GREENHOUSE GAS INVENTORY REPORT (FY 14 – 20)*. https://p12cdn4static.sharpschool.com/UserFiles/Servers/Server_538005/File/School%20Board/Board%20Appointed%20Committees/Sustainability/ORCSD%20Greenhouse%20Gas%20Inventory%20Report.pdf

Gross, C. (2021). *Waste Practices Research for the Town of Durham, Town of Lee, University of New Hampshire, and Oyster River School District*. https://drive.google.com/file/d/1yrcEGTPFAjz-4U6AusCJc2tLT74aEeI-/view?usp=sharing

*Kingman Farm | College of Life Sciences and Agriculture*. (2021). UNH College of Life Sciences and Agriculture. Retrieved December 4, 2021, from https://colsa.unh.edu/kingmanFarm

Lee Sustainability Committee. (2020, December). *LSC Minutes, December 8, 2020*. https://www.leenh.org/sites/g/files/vyhlif776/f/minutes/lsc_approved_minutes_12082020.pdf

McSweeney, J. (2019). *Community-Scale Composting Systems: A Comprehensive Practical Guide for Closing the Food System Loop and Solving Our Waste Crisis*. Chelsea Green Publishing.

Messeder, J., & Lee Sustainability Committee. (2021, November). *One Bin At A Time*. https://www.leenh.org/sites/g/files/vyhlif776/f/uploads/one_bin_at_a_time_revised_nov_2021.pdf

Morrison, S. (2016, June 11). Lee Honored for Recycling Efforts. *ForumHome.org*. https://forumhome.org/lee-honored-for-recycling-efforts-p25594-149.htm

New Hampshire Department of Environmental Services. (2020, November 12). *RULEMAKING NOTICE: Amendments to Composting Facility Requirements*. https://www.des.nh.gov/news-and-media/rulemaking-notice-amendments-composting-facility-requirements

Oyster River Cooperative School District. (2021, August). *Sustainability Management Plan* [In this sustainability management plan, ORCSD is committed to drastically cutting down on its carbon emissions, educating its students and school community about how to make sustainable choices, and paving the way for a

more sustainable future.]. https://p12cdn4static.sharpschool.com/UserFiles/Servers/Server_538005/File/School%20Board/Board%20Appointed%20Committees/Sustainability/ORCSD%20DRAFT%20Sustainability%20Management%20Plan%20(1)%20(1).pdf

Papargyropoulou, E., Lozano, R., Steinberger, J. K., Wright, N., & bin Ujang, Z. (2014, August). The food waste hierarchy as a framework for the management of food surplus and food waste. *Journal of Cleaner Production*, *76*, 106-115. https://www.sciencedirect.com/science/article/abs/pii/S0959652614003680?via%3Dihub

Regional Compost Working Group. (2021). *RCWG and LSC Meeting Minutes*. Retrieved December 5, 2021, from https://www.leenh.org/node/39/minutes/2021

Strafford County Regional Planning Commission. (2021, January 27). *Understanding Regional Waste Disposal and Recycling Systems*. ArcGIS StoryMaps. Retrieved December 4, 2021, from https://storymaps.arcgis.com/stories/a45a1d66aae34ecabda8309f7c374cc0

Town of Durham, New Hampshire, USA. (2021, January 13). *Durham NH signs onto the Global Covenant of Mayors for Climate & Energy.* https://www.ci.durham.nh.us/sites/default/files/fileattachments/sustainable_durham/page/66751/durham_commitment_to_global_covenant_of_mayors.pdf

University of New Hampshire. (2020, June). *ECOLine*. https://www.unh.edu/sustainability/ecoline