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The Marine Impact of UBC's Single-Use Plastics

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THE MARINE IMPACT OF UBC'S SINGLE-USE PLASTICS

A Collaboration Between UBC's Ocean Leaders and Sustainability
and Engineering in Campus and Community Planning as part of the
SEEDS Sustainability Program

Prepared by Carolina Sánchez

Executive Summary

Project Background

The potential impact of the University of British Columbia's (UBC) single-use plastics on marine life has been identified as an area of concern that requires further characterization and quantification (Beaty and Davis, 2018). To develop a better understanding of the extent of this issue, this project aimed to investigate sector-specific single-use plastic consumption, and therefore support the development of effective policy and public engagement strategies to reduce the university's contribution to harmful marine plastic pollution. As part of the SEEDS Sustainability Program, this work is a collaboration between UBC's Ocean Leaders and Sustainability and Engineering in Campus and Community Planning.

Approach

A survey of the scientific literature was conducted to understand how single-use plastic items can enter marine environments and to explore the risks they pose on marine life. The risk of impact for a given item was determined to be composed of the risk of an animal encountering the item, and the subsequent risks of entanglement, ingestion and contamination that the item poses. Additionally, a review of regulatory strategies intended to reduce the consumption of single-use plastics was performed. This review emphasized the need to assess baseline conditions, specifically to identify the most problematic plastic items based on their impacts on wildlife and the environment, and to assess the causes and extent of plastic use.

To explore this issue at UBC, an investigation was carried out to identify the types and amounts of single-use plastics consumed by three major campus sectors that are important plastic users: food businesses, the UBC Bookstore, and research labs. To investigate single-use plastic consumption, we obtained annual procurement details or estimates of top single-use plastic items from a subset of users within the three sectors and then extrapolated these data to the rest of campus. To better understand the risk that UBC's most common single-use plastic items may present to marine life, each plastic item was analysed using a risk assessment model. Here, we accounted for an item's recyclability in Vancouver and its risk of harming marine life (based on physical and chemical properties) should it end up in the ocean.

Findings

From our analyses it was determined that certain plastic items are of greater concern for marine life and should be prioritized in reduction strategies. For example, polyvinyl chloride (PVC, #3) gloves and low-density polyethylene (LDPE, #4) plastic bags are the items that represent the highest risk to marine life and they are either not recycled or shipped internationally for recycling, which increases the probability of them ending up in the marine environment. Gloves are upon the most consumed items in the food sector, and plastic bags are consumed in both the food sector and the Bookstore. Additionally, plastic cutlery made from polypropylene (PP, #5) was the most consumed single-use item at UBC; and given it is not recycled and poses a relatively high risk on marine life it represents a significant problem. Similarly, coffee cups are the second most consumed item, their LDPE lining also isn't recycled and constitutes a moderate risk to marine organisms.

Our analysis also highlights that, in general, items such as cold cups, to-go food containers, sauce cups and lids are the most problematic when they are made of polystyrene (PS, #6) plastic. This is because the items are not recycled in Vancouver and pose a high contamination risk in the ocean. These items should be avoided when possible and alternative products should be chosen instead. Containers made from polyethylene terephthalate (PETE, #1) or PP are better options as they are less toxic and are more likely to be recycled. However, given that food waste contamination is an important issue in the container recycling stream, the ideal solution would be to substitute as many of these items with materials that are fully compostable at UBC. These include plain, uncoated paper products such as paper bags, and paper plates; uncoated wood utensils and fibre-based (paper, wood or bamboo) products that are certified

compostable to BPI or CCME/BNQ or other recognized compostable standards. Items marked as “compostable plastic” and “biodegradable plastic” such as plastic cups, cutlery, food containers and bags are not compatible with UBC’s composting system and regional composting systems (UBC Sustainability, 2016) and should not be considered as good alternatives.

Lab plastic use was also found to be problematic as the most-used items are largely not accepted for recycling and can be quite harmful for marine life if they end up in the ocean. Gloves pose the highest risk and similarly to the food sector, they are among the most highly consumed items in research labs. Pipette tips, made from PP, pose a severe ingestion risk, and constitute the highest amount of plastic waste from labs. Tubes, serological pipettes and petri dishes are also consumed in high numbers and are quite harmful to marine life, especially when made from PS due to the higher contamination risk this material poses. Certain pilot recycling programs, such as for Styrofoam and soft plastics, have been initiated but it still remains a problem that a lot of lab disposable items are not marked with their plastic type.

Recommendations

Based on our conclusions, we recommend that UBC food outlets and the bookstore take the following actions:

- Eliminate the distribution of LDPE plastic bags on campus. Increase the stock of reusable bags to provide as an alternative. If necessary, provide a single-use bag option that is compostable at UBC.
- Reduce the use of gloves when no safety concerns exist, and investigate a campus-wide recycling program
- Eliminate the use of plastic disposable cutlery and straws by providing reusable or fully compostable options (as per UBC composting facility requirements outlined above). This has already been initiated by UBC Food Services and other food outlets should follow suit.
- Reduce the consumption of coffee cups and lids by providing options for reusable cups. Default to offering a ceramic in-store cup and partner with the MugShare program to provide sustainable take-out option.
- Eliminate the use of PS plastic (currently used in coffee cup lids, cold cup lids, container lids, and sauce cups). Substitute them with compostable items (as per UBC composting facility requirements outlined above) or clear PETE or PP alternatives.
- Only choose plastics marked with the corresponding recycling code, and avoid biodegradable or compostable plastics as they are not compatible with UBC's composting system.

For research labs at UBC, given these sector-specific considerations, we recommend the following actions:

- Reduce the consumption of plastic disposables wherever possible (e.g. reuse after washing and sterilizing, or switch to materials such as glass).
- Ensure that items purchased are marked with the corresponding recycling code, and when choosing between materials, choose polypropylene (PP) over polystyrene (PS).
- Implement a program for labs that do sterile work to partner with non-sterile lab to re-use their plastic items.
- Reuse gloves when procedures allow it and no safety concerns exist
- Investigate and implement more pilot recycling programs for more of these lab disposables