A Solution Not in the Bag

Why Recycling Cannot Solve the Plastic Bag Problem in Washington

Written by:
Robb Krehbiel, Environment Washington Research & Policy Center

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Executive Summary

Plastic bags litter our roadways, lakes and creeks, contaminate Puget Sound, and harm Washington's wildlife. Animals can ingest these bags, choke on them, or be exposed to toxic chemicals carried on the plastic.

Voluntary efforts, including recycling programs, have proved insufficient to prevent plastic pollution. In fact, plastic bags actually cause problems for Washington’s recycling industry. When plastic bags are part of mixed recyclables, they get caught in machinery, shutting down recycling operations. Responding to an Environment Washington Research & Policy Center survey, 70 percent of Washington recycling companies want plastic bags out of the waste stream.

There is a simple solution: Cities in Washington, and the state as a whole, can ban single-use plastic bags.

Less than 5 percent of plastic bags are recycled.
  • Every year, Washingtonians use more than 2 billion plastic bags.
  • According to the EPA, only 4.3 percent of all plastic bags in the US were recycled in 2010, down almost 2 percent from the previous year.
  • Plastic production has outpaced recycling for the past 50 years.

Plastic bags interfere with the operation of Washington recycling facilities.
  • Curbside recycling in some of Washington's cities allows the inclusion of plastic bags in mixed recyclables but this actually causes problems in the recycling facilities.
  • Over half of Washington's recycling facilities do not even accept plastic bags. For those facilities, 83% reported that their recycling stream was contaminated with plastic bags and it was causing problems.
  • When plastic bags pollute mixed recyclables, they get tangled in recyclers’ machinery, causing plants to shut down.
  • Some recycling plants in Washington estimate spending 20 to 30 percent of their labor costs removing plastic bags from their machinery – on the order of $1,000 per day.
  • More than 70 percent of Washington recyclers want disposable plastic bags out of the waste system.

Voluntary recycling programs have proven insufficient to solve plastic bag pollution.
  • California attempted to reduce bag litter by requiring grocery companies to place recycling bins in front of their stores. However, the state has seen no noticeable change in litter or waste from plastic bags.
  • California’s program has only managed to increase plastic bag recycling by 2 percent in 3 years.
  • Voluntary approaches like this, are often supported by the plastic industry and tend to preempt local governments and prevent them from taking action to reduce litter and waste.

Plastic bags that do end up collected for recycling are mostly exported to China, where they cause environmental and health problems.
  • China accepts more than half of all reclaimed plastic bags for recycling, and that number is rising.
  • Plastic bag recycling plants in China expose workers to toxic fumes, create a haze that hangs over villages, and pollute groundwater sources.
Consumers bring their own bags in many parts of the world. Washington can follow this example and ban bags.

- Nothing we use for a few minutes should end up contaminating our oceans for hundreds of years.
- Because recycling efforts have proven inadequate, Washington’s civic leaders should ban single-use plastic bags.
Introduction

Plastic trash contaminates Puget Sound and litters its shoreline, lakes and creeks. This litter, including plastic bags, poses a serious threat to wildlife in the Sound. Many marine species may mistake plastic for food. When they ingest plastic, wildlife can choke, suffer digestive system blockages, or absorb toxic chemicals.

In April 2010, West Seattle residents found a grey whale, dead on the beach. A necropsy revealed that the whale’s stomach was full of trash, including 20 plastic bags. Further out in the Strait of Juan de Fuca, the Port Townsend Marine Science Center found that about 12.2 percent of the gulls nesting along the shores were consuming plastic. Half of this plastic was thin film, which includes plastic bags.

Plastic bags never biodegrade. Once in the ocean or a river, they break into smaller and smaller pieces called microplastics. These tiny plastics absorb other chemicals in the water, including the banned toxins DDT and PCBs, becoming concentrated toxic pellets. Microplastics are easily ingested by smaller fish and shellfish, which then introduce these deadly toxins into the food chain. Researchers at the University of Washington - Tacoma have found plastic bits in every water sample they have taken from Puget Sound.

The plastic industry acknowledges the problem with plastic bag litter, but argues that recycling can solve the problem and the harm it causes to the environment.

In this report, Environment Washington Research & Policy Center takes a closer look at this claim. We surveyed recycling facilities in Washington about the effects plastic bags have on their operations, and we examined the results of recycling efforts in other states and nationwide.

We found that plastic bag recycling efforts have proven inadequate to protect our environment from plastic pollution. In fact, Washington recycling companies themselves do not view plastic bag recycling as a solution. Plastic bags cause significant problems for recycling facilities accepting mixed recyclables. Many facilities in Washington report that plastic bags waste money and efficiency, decrease the value of other recycled goods, and pose safety threats to their workers.

The bottom line is that plastic trash does not belong in the ocean. Washington communities should eliminate single-use plastic bags.
Few Plastic Bags Are Recycled

Every year, Washingtonians use over 2 billion plastic bags. Of these, the vast majority will end up in landfills and as litter.

Plastic bag recycling has never been successful in the US. In 2009, the EPA stated that the recycling rate for plastic bags was 6.1 percent. More recent data from the EPA shows that this number has dropped. In 2010, only 4.3 percent of all plastic bags produced were recycled. This is not only a decrease in the proportion of bags recycled, but also a decrease in actual bags recycled. In 2010, 10,000 more tons of plastic bags ended up in landfills than in 2009.

The generation of all plastic products has expanded exponentially over the last 50 years, but plastic recycling has made only modest advancements (figure 1). In the case of plastic bags, over 95 percent of all plastic bags produced end up in landfills and as litter. In Washington, that has resulted in an estimated 25 million bags littering our environment every year, making it one of the top ten most common litter items found in Washington. These bags, loose along streets and waterways, pose a serious threat to wildlife.

Figure 1. Plastic generation and recovery, 1960 to 2010 (U.S. EPA Office of Resource Conservation and Recovery, November 2011)
Washington Recyclers Want Plastic Bags Out of the Waste Stream

Environment Washington Research & Policy Center staff surveyed 21 cities and counties within the state to assess how the recycling industry viewed plastic bags. We found that plastic bags are actually harmful to recycling efforts.

The biggest problem mentioned by recyclers is that the thin plastic bags wrap themselves around gears in the recycling machinery (figure 2). This clogs the screens that separate the incoming waste. Without effective screens, materials go to the wrong place, causing contamination of the recycling stream. Bags can also get caught in gears and clog the entire machine, shutting down operations.

Clogged screens and gears mean a lot of down time, which wastes time, energy, and money. Many recycling plants, including the Cascade Recycling Center, are forced to shut down multiple times a day to remove plastic bags from their machinery. In Tacoma, Charlene Gallagher, Resource Recovery Supervisor at the city’s Solid Waste Management Department, has been involved with the Department of Ecology’s Southwest Region Curbside Commingle Improvement Group. Recycling facility managers and representatives from the paper mills, that are also members of this group, report that plastic bags not only cause many hours of downtime removing entangled plastic bags from the machinery at the facilities, they also contaminate the mixed paper loads that are sent to the mills for processing.

In addition to wasted efficiency, removing plastic bags creates worker safety risks. Workers have to crawl into the machines with box cutter knives to cut them out. This task is made even worst because workers stand on shafts that can turn under them.

Another major concern is the bags contaminate other materials being sorted at the recycling center. Todd Vaught, District Manager for Waste Management employs “additional staff to ensure our mixed paper and newspaper is not contaminated with plastic bags.” Fans, which are used to sort out paper, will often blow the lightweight plastic bags in with paper. This contaminates the recycled paper and reduces the quality of the end products.

All of these problems add up to increased costs for recycling facilities, and in turn, the local governments contracting for their services. Chris Thomas of Waste Connections has been involved in single stream recycling at various facilities in the Northwest for the past 5 years, and he has seen huge costs associated with plastic bags. According to Mr. Thomas, facilities “spend anywhere from 20 to 30 percent of their sorting labor dealing with plastic film that is improperly disposed of in the recycling bins.” Thomas estimates that this adds up to $25,000 to $40,000 per month for each facility. Mike Range of SP Recycling Corporation estimates that the recycling facilities he works with spend $1,000 every day dealing with plastic bags. These costs represent the lost efficiency and labor spent dealing with plastic bags getting caught in machinery and contaminating other goods.

Major Survey Findings:
- **More than 70 percent** of Washington recycling facilities want plastic bags removed from their systems
- Almost 60 percent of these facilities do not accept plastic bags, yet **83 percent of them still have problems** with bags getting into their system, creating problems.
- The biggest problem cited was that **plastic bags clog machinery**. This wastes time, money, and resources. For some facilities, removing bags costs them **$1,000 every day**.
- Many facilities spend **20-30% of their labor** dealing just with plastic bags.
- **Plastic bags are a common contaminate** in recycled paper, easily getting blown in with mixed paper, ruining the end product.
In all, more than 70 percent of surveyed recyclers said they want plastic bags out of their systems. Almost 60 percent of these facilities surveyed already do not accept plastic bags because of the problems associated with them. However, 83 percent of the facilities that do not accept bags still have problems with plastic bags getting into their system. Since plastic bags often have the recycling arrows on them, people get confused and will accidently put them in the recycling, even if their recycling center doesn’t accept them. (See Appendix A for full survey results.)

John Lucini of SP Recycling, states that removing bags would “improve productivity and efficiency of our equipment, reduced residue to dispose of, allow sorters to focus on other valuable items in the incoming stream, and improve quality of outgoing products.”

Other recyclers, like Rich McConaghy of the City of Vancouver agreed, stating that “Commingled recycling processing costs would be reduced, worker safety would be improved, and marketed recyclable materials would be of higher quality if plastic film could be kept out of the curbside recycling stream.”

Recyclers Report Problems with Plastic Bags:
- “Bags get wrapped around discs and shafts plugging the screens up... (and) we ultimately end up shutting down and have people go in the screens to cut the bags out.” – Mike Range, SP Recycling Corp.
- “We have to employ additional staff to ensure our mixed paper and newspaper is not contaminated with plastic bags.” – Todd Vaught, Waste Management.
- “Bags...clog our screens, are difficult to remove economically, and end up being a contaminant in our outbound products. [Removing bags] would improve productivity and efficiency of our equipment, reduce residue to dispose of, allow sorters to focus on other valuable items in the incoming stream, and improve quality of outgoing products.” – John Lucini, SP Recycling Corp.
- “Commingled recycling processing costs would be reduced, worker safety would be improved, and marketed recyclable materials would be of higher quality if plastic film could be kept out of the curbside recycling stream.” – Rich McConaghy, City of Vancouver

In Figure 2, workers are removing plastic bags from recycling machinery. Photo courtesy of Klicker and Waste Connections.
Case Study: Take-Back Bins in California Have Proven Ineffective

Many large grocery stores offer to collect used plastic bags in storefront bins for recycling. The plastics industry argues that these efforts increase the recycling rate of plastic bags. However, take-back bins have proven only minimally effective.

Take the example of California. In 2006, the state of California adopted AB 2449, requiring retailers to deploy storefront take-back bins for plastic bag recycling. There is some disagreement about the effectiveness of the program, especially since the industry refused to give data to government officials. Citing “trade secrets,” the plastic industry never fully disclosed the recycling rates at these bins for plastic bags.

However, officials were able to estimate how AB 2449 affected the recycling rate for plastic bags in California. They determined that the law was a failure. Even the most liberal estimate of the program predicted that after three years of implementation, take-back bins only increased the recycling rate for plastic bags by 2 percent. Officials stated that there was no noticeable change in plastic bag waste or litter as a result of the program.

There is little to no evidence that these types of take-back programs can solve the problem of plastic bag litter and the harm it causes the environment and wildlife. Worse, programs such as AB 2449 can come with clauses that preempt local governments from eliminating plastic bags. A last-minute concession to the plastics industry was placed into AB 2449, preventing local governments from putting a fee on plastic bags. Industry-backed bills that focus on voluntary approaches often include language that preempts local government authority.
Bag Recycling in China Harms the Environment

Plastic bags specifically collected for recycling are often shipped to China, causing more pollution and waste.

According to the plastics industry, the majority of reclaimed plastic film, which includes plastic bags, is exported for recycling. Starting in 2007, the percentage of bags exported to foreign recyclers exceeded bags kept in the United States for recycling. By 2009, the last year data was available, 57.5 percent of all reclaimed film went abroad, mostly to China.¹⁸

In China, plastic bag recycling plants have several environmental and human health impacts. Plastics, which are made from petroleum, first must be melted down to be recycled. During this process, the plastics release toxic petroleum fumes. Toxic additives, including flame retardants, are also released. Few workers wear masks or protective equipment, and they inhale these toxic fumes while working indoors.¹⁹ In many Chinese villages, plastics are melted 7 to 8 times per day, which has created a hazy fog that looms over the villages.²⁰

In other villages, workers clean plastic waste by submersing it in water and sulfuric acid. Once they are done washing the plastics, the acidic wash is dumped into local ditches, contaminating rivers and groundwater. As a result, many Chinese villages with plastic recycling plants can no longer use any local water supplies and instead buy bottled water.²¹

Not even all of the bags sent to China are recycled. Workers who find any sort of contaminant, including "unidentified white dust," have discarded the bags into fields.²² As a result, plastic bags end up cluttering the Chinese countryside, especially in rural provinces.²³
Conclusions and Policy Recommendations

Plastic bags litter our roadsides and make their way to our waterways, threatening wildlife. Whales, seals, and salmon can ingest them, choke on them, or be harmed by exposure to toxic chemicals.

Recycling efforts have thus far proven inadequate to solve the problem. Plastic bags are unnecessary. With so many other cheap, available, and reusable alternatives, there is no reason for plastic bags to remain in our stores or our environment.

Banning disposable plastic bags would be an important step in reducing plastic pollution in Puget Sound.

Worldwide, cities have taken a strong step to eliminate plastic bag litter by banning disposable plastic bags. These bans are common sense and are extremely effective. In Washington several cities have already taken action. Edmonds, Bellingham, Mukilteo, and Seattle have all banned plastic bags to protect wildlife. These cities are leading the way in Washington, protecting wildlife from plastic bags, and reducing plastic pollution.

Washington should adopt a statewide policy that would ban disposable plastic bags. Until this happens, cities and counties should continue taking meaningful steps on their own to eliminate disposable plastic bags.
Methodology

Environment Washington Research & Policy Center asked local governments and their recycling service contractors to complete an online survey. The survey was sent to thirty-three cities and counties. The survey consisted of the following five questions:

1. Does your recycling facility accept disposable plastic bags, like the kind you get at grocery stores?
2. Does your facility experience problems with these bags? If so, what kind of problems?
3. Do you find that a significant amount of labor and/or financial resources are devoted to dealing with these problems? Please provide any data, estimates, or examples that you have on this.
4. Would it be beneficial to you and your recycling facility if the waste stream did not include plastic bags?
5. What sort of benefits, financial or otherwise, would you expect to see by removing plastic bags from the waste stream?

We received full responses from twenty-one municipalities. Of the municipalities that responded, several provided recycling services for multiple cities and counties. The following cities and counties were represented in this study: King County, Pierce County, Thurston County, Lewis County, Mason County, Kitsap County, Grays Harbor County, Whatcom County, Whitman County, Pacific County, Clark County, City of Edmonds, City of Mount Vernon, City of Vancouver, City of Auburn, City of Shelton, City of Oak Harbor, City of Bothell, City of Federal Way, and City of Tacoma.

Quotes in this report come from survey responses, or from additional email correspondence to clarify points made in the survey.
## Appendix A: Survey Results

<table>
<thead>
<tr>
<th>Name</th>
<th>City/County Serviced</th>
<th>Does your facility accept plastic bags?</th>
<th>Do you experience problems with plastic bags?</th>
<th>Would it be beneficial if plastic bags were removed from the waste stream?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mike Range</td>
<td>King, Pierce, Thurston, Lewis, Mason, Kitsap &amp; Grays Harbor counties</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Micah Bonkowski</td>
<td>Issaquah</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Melanie Case</td>
<td>Lewis County</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Steve Fisher</td>
<td>Edmonds</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Scott Sutherland</td>
<td>Mount Vernon</td>
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<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Marty Kuljis</td>
<td>Bellingham/Whatcom County</td>
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<td>No</td>
<td>No</td>
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<td>Sheryl Rhinehart</td>
<td>Pierce County</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Rich McConaghy</td>
<td>Vancouver</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Judi Dunn-Gray</td>
<td>Whitman County</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Jeff Harwood</td>
<td>Thurston County</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Jay Alexander</td>
<td>Pacific County</td>
<td>No</td>
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<tr>
<td>Kathleen Edman</td>
<td>Auburn</td>
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<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>John Lucini</td>
<td>Pierce, Thurston, Lewis, King</td>
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<td>Yes</td>
<td>Yes</td>
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<td>David Baker</td>
<td>Shelton</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Peter DuBois</td>
<td>Clark County</td>
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<td>Rodd Pemble</td>
<td>Bellingham/Whatcom County</td>
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<td>Steve Bebee</td>
<td>Oak Harbor</td>
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<td>Yes</td>
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<td>Sabrina Combs</td>
<td>Bothell</td>
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<td>Yes</td>
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<tr>
<td>Jeanette Brizendine</td>
<td>Federal Way</td>
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<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Charlene Gallagher</td>
<td>Tacoma (recycling facility)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Charlene Gallagher</td>
<td>Tacoma (curbside)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Notes


6 Mark Daniels, Vice President of Sustainability & Environmental Policy at Hilex Poly. “Seattle’s plastic-bag ban ignores reality.” Crosscut, January 5th, 2012. Available at: http://crosscut.com/2012/01/05/environment/21760/Seattle-s-plastic-bag-ban-ignores-reality/


10 Based on a comparison between US EPA data from 2009 and 2010. See notes 8 and 9

11 See note 9


13 See note 6

14 CalRecycles, 2009. Available at: http://calrecycle.ca.gov/plastics/AtStore/AnnualRate/2009Rate.htm


16 See note 15


See note 20

See note 19

See note 20