Wiyot Tribe's Natural Resources Department (NRD)
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Cigarette Butt Pollution

By Patty Torres, Natural Resources Administrative Assistant

Most people are aware of the terrible effects of smoking on human health. Lung cancer, asthma, and birth defects are all well-known health consequences of smokers. However, new research is showing that cigarettes affect the environment in ways that may not be as obvious. Cigarette butt pollution is proving to be a danger to our water quality, affecting fish, wildlife, and entire ecosystems.

Photo credit: www.beachpedia.org

When the detrimental effects of cigarettes first arose as a public health concern in the 1950's, tobacco companies added filters to make them "safer". These big companies lied to consumers by claiming the added filter would protect them against any illness associated with smoking. It is now widely recognized that this was not the case, the addition of filters to cigarettes was only a marketing ploy. Cigarette filters are made out of a material called cellulose acetate, a type of plastic that is not biodegradable. That is, cigarette butts don't break down through natural processes, and their toxins remain in the environment indefinitely. While one might think that a small cigarette butt is harmless, the effects of millions of smokers throughout the country certainly add up.

When cigarette butts are discarded on the street, they most likely wash up in our oceans, creeks and rivers. According to the Cigarette Butt Pollution Project, approximately 120 billion butts are thrown into the environment annually. It is estimated that cigarettes are the most littered item in the world. All these tiny pieces of waste contain toxins that are harmful to the environment. A single cigarette butt can contain nicotine and other cancer causing chemicals. To make matters worse, butts also have heavy metals such as lead and cadmium that are toxic to plants and

animals. In addition to toxic chemicals, discarded cigarettes are also the source of many fires in the United States. These unfortunate accidents take countless lives and cause billions of dollars in damages. According to the National Oceanic and Atmospheric Administration, cigarette waste can also be consumed by fish and birds who confuse them with food. As a result, these animals often die from choking or starvation. A single discarded cigarette butt can have far-reaching, devastating effects.

As more awareness is raised, people around California are taking a stand against cigarette butt pollution. The city of El Cerrito and Berkeley recently passed a strict ordinance to ban smoking in most public places. Organizations such as the Cigarette Butt Pollution Project are working hard to raise awareness, as more cities around the Bay Area hope to pass ordinances such as the aforementioned. Some of the suggested solutions to the pollution problem are: raising taxes on cigarettes, proper labeling to inform consumers of dangerous environmental effects, banning cigarettes with filters, and public outreach. In the meantime, what can people do to help?

- If you smoke, dispose of cigarette butts properly in an ash tray, never on the street
- Purchase cigarettes without filters
- Sweep up cigarette waste around your home so it doesn't go down storm drains leading to local waterways
- Don't smoke cigarettes or get help to quit

For more information visit:
Cigarette Butt Pollution Project:
http://www.cigwaste.org/research/information/

NOAA
http://response.restoration.noaa.gov/about/media/picking-52-million-plastic-cigarette-butts-beaches.html

A Brief Summary on Environmental Impacts of Single-Use Plastic Bags, Senate Bill 270, and Local Ban Ordinances

By Nicole Woodrow, Natural Resources Technician

Single-use plastic bags were developed in the late 1970s to provide a convenient and lightweight method of carrying items. It is now estimated that 100 *million* single-use plastic bags are used by Americans every year. Single-use bags are made from the same material as plastic bottles, a high-density polyethylene (No. 2 plastic type). Since their development, plastic bags have been implemented by stores across the world. More recently, environmentalists have been arguing that the negative impacts of plastic bags far outweigh their benefits. Pro-plastic bag industries and consumers argue that other uses of these bags include pet waste pick up, small trash containers, and other purposes. Ultimately, these bags are used once more and still end up in a landfill. Even worse, since plastic bags are so lightweight, they are easily carried by the wind and could end up as a dangerous pollutant within the environment. Many times, the wind carries them into waterways and where they have the potential to not only pollute water quality, but can kill aquatic organisms. Plastic bags can be confused as being jellyfish or other prey that are consumed and are responsible for many animal deaths.

There are more environmentally responsible methods of carrying purchased items. First, we must re-learn that reducing solid waste pollution has many benefits towards regaining responsibility and stewardship of our natural resources. Second, it can greatly improve environmental health and quality within our surrounding landscapes and reduce unnecessary aquatic deaths. Environmentally conscious and convenient methods are readily available to all who plan ahead. For example, before your next shopping trip, place reusable and durable bags in the trunk of your vehicle. Reusable bags are commonly described as machine washable bags made of fabric or cloth, or plastic bags that are 2.25 millimeters thick that are designed for reuse. These bags can be purchased in the cashier lanes at many stores. Even a cloth bag that you may already own would work just as well. If you do not have a vehicle, there are very compact reusable bags that could fit in a purse/bag such as ChicoBag™, and more.

There are currently 138 cities in California that have adopted plastic ban ordinances. In early 2014, the Arcata City Council adopted a plastic bag ban with a ten cent charge per paper bag that went into effect in all retail stores on February 1, 2014, with the charge in effect on August 1, 2014. In February 2013, Senate Bill (SB) 270 was introduced to California State Legislature. SB-270 is essentially the ban of “Solid-waste single use carryout bags”, with an initial minimum charge of 10 cents per paper bag requested. SB-270 was planned to be put in effect by July 1, 2015. Although, pro-plastic bag industries and consumers are fighting to keep these bags in stores and have gathered enough signatures to postpone SB-270 until statewide voting in 2016.

Plastic bag litter has severe environmental impacts, especially to our local area of Table Bluff. Water surrounds us here, and we are directly overlooking the Pacific Ocean and Humboldt Bay. Due to high winds and the orientation of Table Bluff, it is extremely easy for plastic bags to end up in the ocean and the bay. Please be aware of these impacts and plan ahead to reduce our solid waste pollutants.

If you have any questions, feel free to contact the Natural Resources Department.

For more information visit:
Senate Bill No. 270, Solid waste: single-use carryout bags
http://leginfo.legislature.ca.gov/faces/billVotesClient.xhtml

Humboldt County Resolution Regarding Commitment to Reducing Environmental Impacts of Single-Use Plastic Bags
http://lostcoastoutpost.com/media/uploads/post/12284/Resolution%2Bon%2BCommitment%2Bto%2BReducing%2BImpacts%2Bof%2BSingle-Use%2BPlastic%2BBags%2B%25281%2529.pdf

A Brief History of Plastic Bags
http://www.triplepundit.com/2014/11/brief-history-plastic-bag/

ChicoBag Website
https://www.chicobag.com/

Chemical and Biological Assessment of the Tribe's Natural Resources

By Tim Nelson, Natural Resources Specialist

In October 2014, the Natural Resources Department assessed the Tribe's water resources for chemical and biological constituents during the annual "First Flush" event. During the spring/summer months, the amount of pollution generated will most often collect on our streets and roadways. It isn't until a heavy rain storm (usually over 1") transports this pollution off our streets, down roads and/or storm drains, and eventually into one of our waterways nearby. Similarly, the department conducted biological surveys (plant and avian) to assess the basic habitat of the Tribe's wetlands. Birds and plants can be important metrics to study habitat quality as the presence or absence of specific genera and/or species can be an indicator to the overall health of the wetland.

Assessment from the annual First Flush event showed results within acceptable ranges for all parameters that were measured. Total coliform levels were elevated with fecal coliform present but not at high levels. Since the wetland wells are not a source of drinking water, the presence of coliforms is not a concern and the levels at which they were detected are to be expected in a

natural system. Fecal coliform most often originates from the waste of warm-blooded animals (i.e. mammals) and a main concern for human health is the presence of *E. coli* which can lead to severe gastrointestinal problems and can be fatal to the young and elderly.

Nitrite, ammonia, and total Kjeldahl nitrogen were undetected during the monitoring period but nitrate and phosphorus were detected in low levels. The presence of elevated nutrient (i.e. nitrogen and phosphorus) levels in the wetland has to do with algal growth. As algae utilize the excess nutrient loads, they deplete the oxygen levels in the wetland leading to anoxic (low oxygen) environments. This is turn can have an effect on the vegetation present and lead to significant changes in biodiversity in the wetland. By having native wetland vegetation such as willows and alders, the plants can survive in these environments and act as buffers by filtering out pollutants and nutrients. In drinking water, the presence of nitrite and nitrate levels in excess limits can lead to a respiratory illness in infants called "blue-baby syndrome."

Testing for metals was conducted and nickel was the only inorganic constituent found to be present but within normal limits. Ingestion, absorption, injection, and/or inhalation of large quantities (beyond recommended Maximum Contaminant Level (MCL)) of metals can affect the following systems:

- Dermal (skin)
  - *Arsenic*: Skin damage
  - *Chromium*: Allergic dermatitis
  - *Selenium*: Hair or fingernail loss
  - *Thallium*: Hair loss
- Cardiovascular
  - *Antimony*: Increase in blood cholesterol/decrease in blood sugar
  - *Arsenic*: Circulatory problems
  - *Barium*: Increase in blood pressure
  - *Lead*: High blood pressure in adults
  - *Selenium*: Circulatory problems
  - *Thallium*: Changes in blood
- Digestive
  - *Asbestos*: Intestinal polyps
  - *Beryllium*: Intestinal lesions
  - *Copper*: Gastrointestinal distress (short-term exposure)
  - *Thallium*: Intestinal problems
- Excretory
  - *Cadmium*: Kidney damage
  - *Copper*: Liver problems (short-term exposure)/Kidney problems (long-term exposure)

- *Lead*: Kidney problems in adults
- *Mercury*: Kidney damage
- *Thallium*: Liver/Kidney problems

- Neurological
  - *Cyanide*: Nerve damage or thyroid problems
  - *Lead*: Delays in physical or mental development in kids
  - *Selenium*: Numbness in fingers and toes

For purposes of drinking water, the Tribe monitors water quality by conducting required tests in accordance with U.S. EPA Drinking Water Standards. For more information on the water quality of the Tribe's drinking sources, the Tribe's required Consumer Confidence Report (CCR) can be found at the Tribe's website at:
http://www.wiyot.us/sites/default/files/u6/TBR%20CCR%20newsletter%202013.pdf

Since 2007, biological assessments of the Tribe's wetland have shown a more favorable biodiversity of native plants and avian species utilizing the habitat. For botanical species, the proportional abundance of the three most common species occurring in the Tribe's wetland has stayed consistent since 2008 as coast willow (*Salix hookeriana*), water parsley (*Oenothera sarmentosa*), and buttercup (*Ranunculus repens*) were the most noted. Native species were recorded at an occurrence rate of 40% with perennial species comprising 66% of those recorded. For avian surveys, there are more than 4,414 individual birds of 66 known species have been recorded and characterized according to metrics used to assess wetland habitat health.

For more information on the status of the Tribe's wetland resources, please call or visit the Natural Resources Department.

The Keystone XL Pipeline

By Tim Nelson

Just recently, by a vote of 62-36, Congress approved the expansion of the Keystone XL pipeline, the main transport of tar sands oil from Canada to the United States, despite President Obama's promise to veto the bill and leave the decision in the hands of the executive office. Opponents to the pipeline argue that the extraction process of oil from tar sands uses vast amounts of energy and water, destroys sensitive cultural and environmental areas (e.g., January 2015, 50,000 gallon spill of crude oil in the Yellowstone River in Montana), causes pollution, harms humans and wildlife through drinking water contamination and exposure to cancer causing agents (e.g., benzene), and is a step backwards in regards to America's vision on climate change. In addition,

the economic impact of the pipeline will only worsen as the pipeline would serve as a transport of domestic oil from northern reaches (i.e. Montana) to southern reaches (i.e. Texas) for export thus, potentially leading to an increase in the price of gas in the United States. Proponents argue that the pipeline is a safer means of conveyance as opposed to conventional modes of transportation (i.e. tanker, rail) that result in higher greenhouse emissions and put the environment at a higher risk. Also, proponents argue that the Keystone XL pipeline will create 20,000 new jobs and up to $7 billion in revenue for the U.S. economy.

Currently, the Keystone XL pipeline, operated and owned by TransCanada Corporation, connects Canada's tar sands to the United States via pipelines running from Hardesty, Alberta to Steele City, Nebraska where it is routed east to Wood River and Patoka, Illinois (online 2010) and south to Cushings, Oklahoma (online February 2011) (Figure 1). Phase 3 of the proposed pipeline extension would continue from Cushings, Oklahoma where it will terminate in Nederland and Port Arthur, Texas. An additional extension, Phase 4, will enter the U.S. at Morgan, Montana and travel to Steele City, Nebraska. Most environmental opposition has been voiced over this extension due in part to the area in which it will traverse. One of these regions would be over the Ogallala Aquifer in Nebraska. The Ogallala Aquifer is one of the largest sources of freshwater in the world, spans 8 states, supplies water to nearly 200 million people, and supports a $20 billion agricultural industry. A major leak in this region would contaminate water resources thus, posing health problems and resulting in the endangerment of agricultural food supply.

Figure 1. Keystone XL pipeline (current and proposed lines). Photo: Wikipedia

In addition to our dependence to this non-renewable resource, there are a slew of issues that surround the production, shipment, and use of petroleum based products. Some of these examples include, but are not limited to, pollution, climate change, habitat destruction, and much more. Tar sand, or bituminous oil, is referred to as unconventional oil since it is unlike hydrocarbons produced from a more traditional oil well. Tar sands, according to Canadian authorities are referred to as "petroleum that exists in the semi-solid to solid phase in natural deposits. Bitumen is a thick, sticky form of hydrocarbon, so heavy and viscous (thick) that it will not flow unless heated or diluted with lighter hydrocarbons. At room temperature, it is much like cold molasses." For this reason, bitumen must be heated or mixed with other hydrocarbon sources for transportation. Additional steam injections and refining result in a 12% increase in greenhouse gas emissions per barrel for this oil source.

Environmental threats surrounding the production of oil from tar sands are greater than conventional means of pumping oil from wells. Due to the viscosity of the resource, bitumen is heavily concentrated in metals and is further contaminated by the extraction process. Since up to 90% of Canada's bitumen is below ground, open pit mining is not a viable option. Instead, injection of steam and other solvents to liquidize the product increases the likelihood of contamination of water resources and results in higher carbon emissions. Water contamination by these extraction processes has been linked to abnormalities in fish eggs and tumors and other deformities in fish from Lake Athabasca and its tributaries. Similarly, human and wildlife health concerns have been linked to the extraction of oil from the tar sands since the products of hydrocarbons (i.e. benzene, toluene, ethyl benzene, and xylene) are known carcinogens. Migratory birds and other wildlife (i.e. moose) utilizing the fragile, nearby boreal forests are at risk of contamination and threat of habitat loss. In addition, cultural resources such as clean water sources, loss of gathering grounds, and destruction of sacred places and artifacts are at risk near the source of bitumen extraction at tar sand mines and all along areas where the pipeline exists. Currently, the existing Keystone Pipeline is located within 30 miles of over 150 Indigenous communities in Canada, and TransCanada Corporation has facilities on a dozen First Nation reserves. Over 100 miles of the pipeline pass through Native American reservations, and numerous Native American communities are within few miles of TransCanada departments.

The future of America's climate change policy can easily be determined by the decision the President will soon make in regards to the expansion of the Keystone XL pipeline. If we desire to free ourselves from the quickly fading grip of oil, it would be desirable to make decisions, policies, and direct funding to sources that are renewable and worthwhile. The change will not happen overnight and it will take a gradual change to prove the worthwhile investment from nonrenewable to renewable energy. Current projections for near depletion of petroleum resources are near the year 2050! A decision by the President to halt the installation of pipe to haul more nonrenewable resources will be a step in the right direction to making our country less dependent on petroleum based products.

For more information on hydrocarbons, non-point source pollution, and ways you can help to prevent pollution, please call, email, or visit the Natural Resources Department.