



Bottom Dwellers

Getting to the bottom of our trash problem includes a discussion of our plastics and oceans.

We'll just be coming off Cumberland County's trash hunt when this article appears so I thought, why not share

some statistics about litter in our waterways? Winds, storm drains, careless people, and even intentional litterers end up fouling our local rivers and streams with all manner of plastics. I'll limit this to just a few examples.

Plastics are clearly one of the most impactful pollutants in our waterways, and they constitute more than 60% of marine debris.

It used to be thought that most plastic in the ocean was at the surface in large rafts called "garbage patches." In fact, recent studies estimate that 90% of the plastic in our seas is less than a quarter inch in size: what the researchers call *microplastics*.

Marine invertebrates like larvaceans (a type of clear floating ocean creature), mistake the *microplastics* for food because they become algae-encrusted and therefore have a food-like odor. When the larvaceans excrete the plastic their pellets sink to the ocean floor, exposing bottom feeders to these substances, too. People focus on the visible rafts of plastic rather than on the invisible particles lying on the bottom which are equally harmful.

Not only do rather small invertebrates eat the microplastics, but NOAA researcher Matthew Savoca found that

50 types of fish were also consuming them - and he surely didn't study all the world's species. Being in great abundance, anchovies are a crucial forage fish. They are at the bottom of the food chain for much of the seafood we eat, and evidently they are devouring a lot of plastic bits. Larger fish then consume smaller fish in such great quantities that their body tissues magnify the polluting effects.

Therefore all these pollutants find their way into our food supply: not only the fish we eat but even 90% of the sea salt we consume is said to be rife with plastic.

A number of studies estimate that by 2050 there will be more pounds of plastic in the oceans than fish.

Driving in my car across the Main Street bridge a number of weeks ago, I heard a report on the effects of one cigarette butt on about 2 gallons of water. It seemed coincidental that I was crossing the Maurice River at the time. So I decided to try to figure out how this was possible. I, for one, pay attention to coincidence. That this fact had previously eluded me seemed irresponsible: "One cigarette butt affects 2 gallons, for real?"

In California there is a coastal cleanup that has been going on for over 25

years. And the items in greatest abundance at these cleanup events are cigarette butts, which are made of a plastic called cellulose. In fact, over 25 years they have collected 53 million of the nasty buggers - imagine enough to fill 100 Olympic-sized pools. And this part blew my mind: one discarded filter can pollute 7.5 liters of water in just one hour. This polluted water kills ocean creatures. Why? Well, it turns out that butts contain nicotine, ammonia, arsenic, lead, and other heavy metals. (Coastal Cleanup Day San Diego County)

Cigarette filters intended to help make smoking healthier turn out to be the single greatest source of ocean pollution and resulting mortalities. Seven thousand carcinogens are connected to discarded butts. And ironically the World Health Organization reports that cigarette filters, a 1950 innovation, makes cigarettes NO SAFER.

One study estimated that 954 million kilograms of filters were produced in 1998 alone, with many of them littering streets, waterways, and public lands. The litter problem is compounded by packaging, lighters, not to mention the social and environmental impacts of deforestation, farmland not producing food, fires to clear land for tobacco

plantations, health costs, cancer, shattered lives, and so on. (Cigarette Butts as Litter: Toxic as Well as Ugly. *Underwater Naturalist: Bulletin of the American Littoral Society*, Volume 25, Number 2, August 2000.)

Let's save plastic drinking water bottles and bags (and BALLOONS!) for another day, shall we? Suffice it to say that I would much rather write about screech owls, turtles, and trees. But the hard realities dictate that if we don't address this difficult issue there will not be a future for all creatures great and small, including ourselves!