

Tobacco's Impact on the Environment

FACT SHEET



**From growing tobacco plants to the disposal of cigarette butts,
the whole life cycle of a cigarette takes a heavy toll on the environment.
The ecological impacts of tobacco are serious cause for concern.**

- **What's in a cigarette butt?** A cigarette butt contains the remnant tobacco portion of a cigarette, a filter that is NOT cotton, and **165 toxic chemicals**. 95% of cigarette filters are made of cellulose acetate, a **thermoplastic** formed by the reaction of cellulose, acetic acid and acetic anhydride that is slow to degrade in the environment. It may take two months in favorable atmospheric conditions; and up to 3 years or more in seawater for a cigarette butt to degrade (*Source: California Waste Management Bulletin*).

Cigarette butt filters trap the dangerous by-products of smoking by accumulating particulate smoke components and **165 toxic chemicals**. These chemicals leach into the environment:

• Arsenic	used in rat poison	• Acetic acid	in hair dye and photo developing fluid
• Acetone	main ingredient in paint thinner and nail polish remover	• Ammonia	a typical household cleaning fluid
• Benzene	found in rubber cement	• Butane	cigarette lighter fluid
• Cadmium	found in batteries and artist's oil paints	• Carbon Monoxide	a poisonous gas found in car exhaust
• DDT/Dieldrin	Insecticides	• Formaldehyde	used to embalm dead bodies
• Hexamine	in barbecue lighter fluid	• Hydrazine	used in jet and rocket fuels
• Hydrogen Cyanide	used as a poison in gas chambers	• Lead	a highly poisonous metal
• Napthalenes	used in explosives and moth balls	• Nitrobenzene	a gasoline additive
• Phenol	used in disinfectants and plastics	• Polonium-210	a highly radioactive element
• Stearic acid	found in candle wax	• Toluene	found in embalmer's glue

- **Why is there so much butt litter?** Litter breeds litter ~ occurring most often where litter has accumulated. Butts are the first discarded item in a chain reaction of all litter ~ called the "gateway theory," which posits that "once litter appears, litter of all sorts will follow." The increase of butt disposal directly into the environment may be a side-effect of restrictions on smoking in workplaces, bars and restaurants (*Source: Keep America Beautiful; Francis T. McAndrew, Professor of Environmental Psychology, Knox College, Galesburg, Illinois*).
- **How do cigarette butts contribute to water pollution?** Cigarette butts are the most littered item accumulating in our waste stream. Worldwide, 4.3 trillion are littered annually. Their chemicals contribute to non-point source pollution when carried through storm drains by rainfall and urban runoff to our lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water. Non point source pollution has harmful effects on drinking water supplies, recreation, fisheries, and wildlife (*Source: CigaretteLitter.org*).
- **How significant is the impact of non-point source pollution on water quality?** Non-point source pollution is the result of a variety of human activities on land that cannot be identified from a single source. Pollutants can include insecticides, oil, trash, sediment and toxic chemicals in cigarette butts. The EPA estimates that non-point source pollution accounts for 65% of pollution in rivers, 76% in lakes, and 45% in estuaries in the United States. Underwater plants and aquatic animals, such as oysters, herring, striped bass, and submerged aquatic vegetation (considered to be the foundation of a stable aquatic ecosystem) are particularly threatened or damaged by non-point source pollution. Beach closures, destroyed habitat, unsafe drinking water, and many other severe environmental and human health problems result from NPS pollutants (*Source: EPA National Assessment Database*).
- **How do cigarette butts impact aquatic life?** Aquatic bioassay studies using EPA protocols provide evidentiary conclusion that **one cigarette butt per 2 liters of water is acutely toxic** to water fleas ~ a planktonic animal that occupies a critical position in the food chain of aquatic ecosystems by transferring energy and organic matter from algae to higher consumers such as fish. Water fleas are widely used to determine acute toxicity of chemicals in aquatic invertebrates. The **165 toxic chemicals** that leach from a cigarettes' cellulose acetate filter and remnant tobacco are a biohazard to the water flea. 100% of the animals died after 48 hours in the concentrations that were equivalent to the chemicals found in two or more used cigarette filters (*Source: Clean Virginia Waterways using US EPA Aquatic Invertebrate Acute Toxicity Test for Freshwater Daphnids protocols, 1996*).

- How does cigarette butt litter affect beaches?** In 2003, and for more than **15 consecutive years**, cigarette butts have ranked as the **#1 littered item** collected from our sandy shores during California's Coastal Clean Up Day. Ecologically, sand on beaches is an essential habitat to many coastal-dependent species ~ including some of the 23 endangered species of the Monterey and Gulf of Farallones National Marine Sanctuaries. Shorebirds, such as terns, sandpipers, and snowy plovers feed on microscopic creatures, diatoms and bacteria found in grains of sand. Tumors found in turtles returning to beaches to lay eggs in the sand have been linked to cigarette butt pollution in Hawaii. Sea lions, elephant seals and harbor seals haul out daily on beaches to absorb the heat from the sun, give birth and feed their newborn pups. Crabs, clams, starfish and sea urchins are commonly found on nearly all beaches. According to the UN International Maritime Organization, 177 species of marine animals and 111 species of shorebirds are affected by tobacco litter causing unnecessary malnutrition, starvation, and death (*Source: California Coastal Commission 2003, UN International Maritime Organization 2003*).
- How does cigarette butt litter affect the food chain?** Ingestion of plastic cigarette filters is a serious threat to wildlife. A visible consequence is being witnessed higher up on the food chain by field biologists and wildlife rehabilitators who routinely find cigarette butts in the intestines, stomachs, and X-rays of dead or sick sea turtles, birds, fish, and dolphins. Seabirds that forage for food near dunes have been observed ingesting cigarette butts. Biologists suspect even trace amounts of chemicals may have harmful effects at the origins of the food web. In particular, nicotine poisoning may cause tiny invertebrates, such as coquina clams to be groggy, reducing their reaction time and more apt to becoming prey for predators. The coquina clam is important food for pompano fish. Higher concentrations of toxins can accumulate in the bodies of larger animals as they move up the food chain. By comparison, most cases of nicotine poisoning among children result from their ingestion of cigarettes (*Source: University of Central Florida, American Association of Poison Control Center*).
- How does tobacco contribute to outdoor air pollution?** The EPA classifies environmental tobacco smoke, or "secondhand smoke," as a Class A carcinogen, in the same category as asbestos and radon, both known to cause cancer in humans. Secondhand smoke contains **more than 4,000 chemicals**, including nicotine, arsenic, benzene, formaldehyde, carbon monoxide, and polonium 210 ~ a radioactive element. While smoke dissipates more quickly outdoors, atmospheric dispersion testing assessing the environmental impact from cigarette smoke under numerous meteorological conditions has shown smoke plumes rise to a certain height, then descend because the combustion particles and gases in secondhand smoke are heavier than air. Deadly particles linger in the air long enough to be breathed into the lungs. Secondhand smoke can cause cardiovascular and cerebrovascular disease; cancer and respiratory diseases and related disorders. It is associated with an increased risk for sudden infant death syndrome, asthma, bronchitis, and pneumonia in young children (*Source: Centers for Disease Control; National Center for Chronic Disease Prevention and Health Promotion; Secondhand Smoke Consultants, Repace Association, Inc.*).
- What are other impacts of tobacco and cigarette butts on the environment?**

Wildfires: In much of the western United States, wildland fires are a natural event where ecosystems adapt to periodic recurrences to recycle nutrients and renew system functions. And while wildfires can be initiated by dry season lightning storms or fire management agencies, the growing human population moving into wildland-urban interface areas is increasing the number of fires inadvertently caused by discarded cigarette butts. From an ecological perspective, these fires unnecessarily destroy wildlife habitat and do not fit within a natural occurrence where flora and fauna have adapted. Extreme fire behavior can result in loss in soil productivity, increase sedimentation in streams and water supplies, degrade or destroy critical habitat for fish, wildlife, and plant species (including those at risk of extinction), and increase the spread of invasive weeds or non-native plants. Fires also emit millions of tons of gases and particulate matter into the air, with serious consequences for human health and carbon balances that contribute to global climate change (*Source: USDA Forest Service*).

Tobacco Production: Tobacco is grown in more than 100 countries worldwide, mostly in developing countries. As a crop, it is responsible for damage to ancient forests (deforestation), soil nutrient depletion, green tobacco disease in farm workers, and pollution from pesticides and fertilizers. After harvesting, tobacco is dried and cured to preserve it for storage, transport and processing. Indigenous trees are cut down to provide fuel for the curing process and construction of curing barns. Tobacco is a sensitive plant prone to many diseases, and requires up to 16 applications of pesticide ~ including DDT and methyl bromide ~ during a 3-month growing period. Methyl bromide contributes significantly to ozone depletion (*Source: Action on Smoking and Health*).