Queensland litter and illegally dumping management framework and conceptual models

Littered and illegally dumped waste is the most visible form of pollution in our environment. It impacts many aspects of our lives, from our health and wellbeing, to our lifestyle, along with the devastating impact it has on local environments and wildlife.

Research indicates approximately 80 per cent of sea-based waste originates from land-based sources. Although a great deal of research has been completed relating to marine litter, it's movement and the effects on wildlife, such as seabirds and turtles, there is limited research on the effects of litter on the terrestrial environment or it's movement from the land to the sea.

The framework

A key deliverable of Queensland's Waste Management and Resource Recovery Strategy is Keeping Queensland Clean, the Litter and Illegal Dumping Plan (the Plan).

The Plan outlines how we, as Queenslanders, can work together to combat litter and illegal dumping across the state.

A headline action of the Plan is the Litter and Illegal Dumping Management Framework (LIDMF).

As a holistic biophysical management framework, the LIDMF will map littered and illegally dumped materials from sources through to sinks, its effects on values, as well as the ways it moves through the environment.

The primary aim of the LIDMF is to help prioritise and identify the most appropriate intervention strategies—to achieve the best outcomes for our health, wildlife, culture, environment and economy.

Included in the LIDMF are a series of conceptual models that visualise how litter and illegally dumped material moves through the landscape.

All of the information will be available online and accessible to the general public.

The information in the LIDMF will be based on peer-reviewed, scientific literature, developed in partnership with a number of key stakeholders including universities, community groups, non-government organisations, and state and local governments.

Objectives

The LIDMF will provide information to:

• guide effective policy and programs
• strategically address the economic, environmental and social costs and impacts of managing litter and illegal dumping.

The following categories for littered and illegally dumped waste have been indentified for developing the LIDMF.

Sources of waste

Nine major source locations of litter and illegal dumping have been identified:

• agriculture
• community parks and events
• households
• industrial estates
• marine
• national parks and state forests
• roads
• sewage treatment plants
• shopping and business centres.

Sinks (where waste ends up):

To date, the project has identified five major sinks:

- water surface
- water column
- benthic
- soil
- water and soil biota.

In water, there is movement within the different parts.

Movement of waste:

Ways that littered and illegally dumped waste can move through the environment:

Air

Waste is often moved by wind. For example, a study in the remote French Pyrenees, discovered 365 pieces per square metre of microplastic landed every day via wind.

Extreme weather events also contribute to the amount and volume of movement through air.

Water

Water is one of the major ways that littered and illegally dumped waste moves through the environment. For example, litter being tossed from a car and being washed down a stormwater drain, or the intentional washing of paint brushes into a gutter.

Although there are many ways to prevent litter and illegally dumped waste from moving through the drainage system (gross pollutant traps and other 'capture' systems) there is no clear consensus of how effective these measures are and how much waste is escaping.

The LIDMF will show how waste flows through these systems, and provide information to help determine more effective and targeted actions. For example, calculating the percentage of waste passing through a drain to determine the most appropriate gross pollutant trap and how often it needs to be cleaned.

Extreme weather events such as heavy storms and cyclones also move an immense amount of litter and illegally dumped waste in a short period of time.

Mechanical

Litter and illegally dumped waste can move through the environment via humans and their activities for example, cars, trucks, motorcycles and other mechanical means.

Even lawnmowers are a mechanical means for moving litter through the environment. Running over a plastic bottle with a lawnmower can result in the bottle's fragmentation into microplastics, which are then more easily able to move by wind and weather.

Biological

Animals can move waste in the environment, from birds collecting litter for their nests to rats and dogs scavenging for food.

Although making up a small percentage of waste movement it does have a significant impact on wildlife and environmental values.

Effects on values

The following values have been identified as being most impacted by litter and illegal dumping:

- human health
- wildlife
- culture
- social
- economy.

Attribute-based classification of waste items

The LIDMF will provide a detailed biophysical attribute-based classification system for littered or illegally dumped wastes. This allows for the complex analysis of waste by type, enables easier identification of the movement of materials through the environment and provides a translation tool for communicating results.

For example, a plastic bag will have attributes like size, colour, flexibility, elasticity, etc., along with various impacts on values.

For more information on LIDMF

Please contact the Litter and Illegal Dumping Programs team, via email at: LIDPrograms@des.qld.gov.au