April 2018

Extent of microplastics in Pacific Sand Lance burying habitat in the Salish Sea

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Peters, Willem; Robinson, Cliff; Kohfeld, Karen; Pellatt, Marlow; and Bertram, Douglas, "Extent of microplastics in Pacific Sand Lance burying habitat in the Salish Sea" (2018). Salish Sea Ecosystem Conference. 422.

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Extent of microplastic contamination in Pacific Sand Lance burying habitat in the Salish Sea

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Microplastic History & Physiology

• Microplastics vs macroplastics
• Microplastics are any plastics <5mm
• Come from a variety of sources.
• Are a relatively recent environmental issue
• Pacific sand lance (Ammodytes personatus) makes its habitat in course sediments along the coast of the Pacific Northwest

• They feed in the water column during the day and burrow in seafloor sediment at night to sleep
Their Adverse effects on Ecosystems

• Accumulate in an organism’s digestive tract
• Act as transporters of toxins
• Contain antibacterial compounds that can suppress bacterial processes
Methodologies of Collection

**In the Field**
- Beach combing
- Sediment sampling
- Marine trawls
- Biological sampling

**In the lab**
- Microscopes
- Dyes
- Spectroscopy
- Saline solution
My Direction of Research

• To quantify the abundance of microplastics in Pacific Sand Lance habitat in the Salish sea

• To correlate patterns of microplastic abundance with various environmental factors
Research Questions

01 Does microplastic abundance differ among sediment types?

02 Does microplastic abundance differ by ocean depth? Other environmental factors?

03 Are microplastics significantly pervasive in suitable Pacific Sand Lance habitat?
## Defining Pacific Sand Lance (PSL) habitat

<table>
<thead>
<tr>
<th>Highly Suitable Habitat</th>
<th>Pacific Sand Lance (PSL) not caught; Fines (0.125mm) &lt; 15.5% AND silts (&lt;0.063mm) &lt; 0.8%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderately Suitable Habitat</td>
<td>PSL not caught; Fines (0.125mm) &gt; 15.5% BUT silts (&lt;0.063mm) &lt; 0.8%</td>
</tr>
<tr>
<td>Not Suitable Habitat</td>
<td>PSL not caught; Fines (0.125mm) &lt; 15.5% AND silts (&lt;0.063mm) &gt; 0.8%</td>
</tr>
</tbody>
</table>

(Robinson et al, 2018)
Microplastic abundance appear to increase as you move northward through the Salish Sea.

They appear to be more prevalent in highly and moderately suitable Pacific Sand Lance habitat.
Pacific Sandlance habitat suitability in relation to ocean depth

Pacific Sand Lance suitability classes are correlated with Depth

Depth Class (10m intervals)

PSL Habitat Suitability

Highly Suitable
Moderately Suitable
Not Suitable
PSL Present
Microplastic abundance is also correlated with Depth.
Microplastic abundance is correlated with Pacific Sand Lance suitability classes.
Number of microplastics found in sediment at different depths

Habitat suitability classes
- Highly Suitable
- Moderately Suitable
- Not Suitable
- PSL Present
Microplastics are more abundant in shallower water (0-50m).

Microplastics are more abundant in coarse, sandy sediment than in fine, muddy sediment.

The most common type of microplastic are blue fibres

Microplastic abundance seem to be highest in the Northern Georgia Straight
Implications of Research

Marbled Murrelet (Brachyramphus marmoratus) is an endangered species under threat from the adverse effects of microplastics.

Fisheries and aquaculture in the Straight of Georgia could also be negatively impacted.
Thank-you!

Questions?