The same waves that pound the shore off California also tear large amounts of seaweed from the region’s giant kelp forests and rocky reefs. Much of this drift seaweed, known as wrack, is eventually washed ashore. On many of Southern California’s beaches, tractors will remove this wrack (along with trash and litter) and rake the sand, in a process known as beach grooming.

With California Sea Grant support, biologists at the University of California and Pepperdine University have been studying wrack’s role in coastal ecosystems and the ecological consequences of mechanically removing it from sandy beaches.

Results from multiple studies show that beach grooming practices, even seasonal schemes, can have major impacts on the ecology and sustainability of sandy beaches, many of which are already under stress from sea level rise and coastal development. Heavy equipment on the beach also destroys nesting habitats for shorebirds such as the Western snowy plover and can crush clutches of grunion eggs that female fish bury in intertidal nests in the sand.

In peer-reviewed research, biologists show that leaving wrack on the beach helps maintain foraging opportunities for shorebirds and benefits native coastal strand plants that trap sand and create sand dunes. In recent work, biologists estimate that about 40 percent of the animal species living on sandy beaches depend on wrack. In an ongoing project, they are studying the importance of decomposing wrack in supplying nutrients to coastal ecosystems.

**SUMMARY**

The scientists report that groomed beaches have significantly lower biodiversity, with:

- Dramatically fewer beach hoppers, predatory beetles and other small creatures that hide under and feed on wrack
- Fewer native plants that trap windblown sand
- Fewer hummocks (low mounds of sand formed by wind)
- Fewer shorebirds, such as black-bellied plovers, snowy plovers and marbled godwits
- Conversion of coastal strand habitat to barren sand with loss of dune formation
- Loss of nutrients to plants such as surfgrass from the breakdown of wrack

**GROOMED VS. NATURAL BEACHES**

<table>
<thead>
<tr>
<th>GROOMED</th>
<th>UNGROOMED</th>
</tr>
</thead>
<tbody>
<tr>
<td>La Jolla Shores Beach Park</td>
<td>Torrey Pines State Beach</td>
</tr>
<tr>
<td>Mission Beach</td>
<td>Black’s Beach</td>
</tr>
<tr>
<td>Coronado City Beach</td>
<td>Silver Strand State Beach</td>
</tr>
<tr>
<td>Imperial Beach</td>
<td>(south end)</td>
</tr>
<tr>
<td></td>
<td>Borderfields State Beach</td>
</tr>
</tbody>
</table>

This beautiful beach primrose is a common coastal strand plant, living in the zone between the foredune and high-tide line. David Hubbard

Western snowy plover chicks find safety and food in the wrack line. Can you imagine what the world looks like to this tiny chick? www.westernsnowyplover.org

A tractor outfitted with a large metal rake removes wrack from the beach. Karen Martin

Black’s Beach in San Diego County, a natural beach with intertidal wrack brought ashore by waves and tides. Jenifer Dugan
This publication is based on research projects R/CZ-174 and R/ENV-210, and is supported by NOAA Sea Grant, U.S. Department of Commerce, under grant NA10OAR4170060, project C/P-1. The views expressed herein are those of the authors and do not necessarily reflect the views of NOAA or any of its sub-agencies. The U.S. government is authorized to reproduce and distribute for governmental purposes. This document is available in PDF on the California Sea Grant website: csgc.ucsd.edu. California Sea Grant, Scripps Institution of Oceanography, University of California, San Diego, 9500 Gilman Drive, Dept. 0232, La Jolla, CA 92093-0232 Communications Phone: 858-534-4446

Many people have probably never seen a beach hopper (left), intertidal pillbug (middle) or flightless rove beetle (right) because they are no longer found on groomed beaches in Southern California. These tiny critters are, though, essential components of a healthy beach ecosystem. For example, beach hoppers help clean the beach by eating kelp and, along with other tiny invertebrates, are a key food source for shorebirds, and a reason birds forage at the beach. UC biologists report that some wrack-associated invertebrates could easily go extinct without protection from grooming and other human activities.

RECOMMENDATIONS FOR MANAGERS

To help restore beaches, scientists recommend that managers consider:

- Hand grooming to selectively remove trash and improve beach aesthetics, while enhancing beach ecology by allowing wrack to remain on the beach.
- Creating no-grooming zones, within which wrack can remain on some sections of beach year-round.
- Public education to teach residents, visitors and decision-makers about beach ecosystems and the value of wrack to coastal wildlife and ecology.

WHAT YOU CAN DO

- Leave only footprints. Take your trash home.
- Respect areas set aside for wildlife restoration.

PEER-REVIEWED SCIENCE ON BEACH WRACK


CONTACT: Jenifer E. Dugan, Marine Science Institute, UC Santa Barbara j_dugan@lifesci.ucsb.edu | 805-893-2675