RESTORING OREGON'S DUNES

The bid to save a national treasure

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OREGON DUNES RESTORATION COLLABORATIVE

The Oregon dunes hold many stories.

FAMILY TRADITIONS, FIRST VISITS, AND UNFORGETTABLE ADVENTURES ARE captured here. Our stories traverse the dunes – on wheels and on horseback, in canoes and kayaks, on foot and in spirit. Some of us linger for days, while others glimpse these sandy mounds from a passing car, their curiosity piqued. It's comforting to know the dunes await your next visit.

Although we are drawn to the dunes for different reasons, we are united by one thing: the awe we feel when we look across this landscape. We have a passion for this place, and a strong sense of responsibility for maintaining its uniqueness. What is the story of the dunes? How did they get here? Who lives and has lived here? Why are they disappearing?

We invite you to join us as we explore the Oregon dunes – their vastness and their hidden pockets, their deep history and the incredible changes they've undergone in the last half century. Come with us as we tell their story, and learn how this story is yours as well.

A journey through time and sand

THE DENSE COASTAL TRAIL BURSTS OUT INTO AN UNEXPECTED LANDSCAPE. The sun breaks through the fog here and there, revealing pockets of blue sky above and an expanse of white sand below. A visitor looks down and discovers this large hill is built upon sand, a massive dune decorated with wind-carved patterns and dotted with flowers of purple, pink, yellow.

A mad gallop down the steep dune brings the visitor to a stretch of dry open sand, until the trail dips into a firmer, somewhat damp depression then rises up again into a scrubby woodland. Here the trail becomes more solid, less sandy underfoot. Arching overhead, tall salal shrubs, willows, and shore pine form a shady, tangled tunnel in the thicket. A great blue heron alights from a small pond glimpsed through a clearing. The trail emerges from the shadows onto a broad hummocked landscape of sand, grasses, and sea. The wind blows, and sand piles around the whipping blades of grass. Animal tracks not yet blown away weave through the dunes and shorebirds skitter across the wet sand avoiding incoming waves.

What is this place, that seems to stretch as far north and south as the eye can see? What is it that draws thousands of visitors, inspires artists and adventurers, and lays bare 100,000 years of geologic history? What life does it hold, what mysteries does it conceal, and why is it transforming, a way of life disappearing?

We invite you to ramble in your mind's eye through the Oregon dunes, a sandy landscape of wind-sculpted hills and ridges, scoured wet plains, and impenetrable woodlands. Imagine the mile-long traverse from the highest dune west to the Pacific Ocean, which is like time-traveling through geologic eons, centuries of human history, 50 years of ecological time, and some distance into the future. Together we will explore this incredible place and how we can save it.

"The dunes change every day. I never realized sand could be alive, but it is…moving, sculpting, destroying, and creating. Step out on the sand and you are instantly part of something wild, a history that stretches far back in time to the building and rebuilding of our beautiful planet Earth. When you are there, time stops, worries drift away, and it feels darn good to be alive."

Dina Pavlis, author *Secrets of the Oregon Dunes*, Oregon Dunes Restoration Collaborative member

The story of the dunes

WHAT MAKES A DUNE? TO UNDERSTAND HOW A SAND DUNE FORMS, ONE MUST TRAVEL far back through geologic time, to over 45 million years ago when shifting tectonic plates caused earthquakes, volcanic eruptions, and massive floods that led to the formation of the mountains and rivers we see in Oregon today. These mountain-building events pushed rock up toward the Earth's surface where they became the Cascades and Coast Range, giving western Oregon its unique form.

Eons of weathering washed rocks and sediment down from these mountains into rivers and streams, where they were flushed into the sea. At the mouths of the Siuslaw, Siltcoos, Tahkenitch, Umpqua, and Coos rivers are swathes of sand where these deposits collected and were ground smooth by waves over time.

As the sea receded to its lowest level, fine sand was left behind on dry land, which subsequently moved about in the wind and eventually collected into a huge sand reservoir. As the sea level rose again, the sand was once more inundated with ocean water. Waves along the coastline pushed the collected sand back up onto dry land, forming the massive deposit we see today.

"What kid doesn't want to play in a giant sandbox?"

Jody Phillips, Save the Riders Dunes, Oregon Dunes Restoration Collaborative member

"The dunes have always been special to me. My favorite time was when we rented dune buggies – it was super fun. Even though that was my favorite time, I can't forget about all of the other times hiking, sandboarding, and geocaching."

Elijah C., age 15

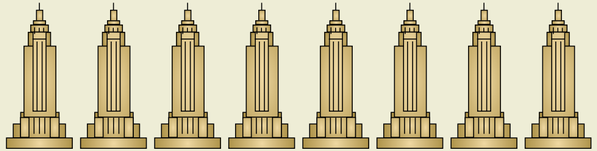
Oregon's coastline sits on a broad shelf that stretches from land out into the sea. The flat terrain is the foundation upon which the dunes are built, where sand was deposited over thousands of years by tides and waves and could move and shift by the force of wind fairly unobstructed. Dips and wrinkles in the terrain would catch and collect the accumulated sand, until a strong storm set the landscape in motion again.

To feel the wind on the coast is to feel the touch of what has shaped – and reshaped – the dunes over time. Fine particles of sand blow freely where vegetation doesn't hold it in place. Winter winds blow from the southwest, and dunes transform into their winter shapes. In summer, as the land heats in the sun, updrafts pull cool air off the ocean in the form of a steady northwesterly wind. The sands shift from day to day, storm to storm, and season to season, and life on the dunes has evolved to shift with it.

An untrained eye may look out across the expanse of sand and see little life – some grass blowing in the wind, copses of shore pine, a sandpiper near the water's edge. Look more closely and you will find pockets of a complex ecosystem, full of life.

How much sand is there in the Oregon dunes?

The sand in the Oregon dunes could fill the Empire State Building over 7,000 times.



The dunes are about 50 miles long, average 1.5 miles wide, and are up to 125 feet deep.

That comes to about 261,360,000,000 cubic feet of sand.

Western snowy plover skitter between wrack line (ocean debris deposited at high tide) and dunes, foraging for insects. Great blue herons fish in the waves that lap the shore. Coyotes hunt small mammals and raccoons scavenge for their next meal. The quiet visitor, if lucky, spy a rare marten running in a tree after a storm, or a tiger beetle, found few other places on the planet, stalking across the sand.

Splashes of yellow, pink, and purple dot the sand, brightening the palette of the landscape. Lupine, wild pea, and sand verbena wildflowers growing in rare harmony are grouped together here as nowhere else. In some places, the landscape is patchy, remnants of a once shifting mosaic of woods, wetland, and open sand that offered a wealth of resources for animals and humans alike. It's truly a place full of life. Life that's part of an elegant dance with the sand and wind. Life that's changing.

Structure of a functioning dune system

The dunes ecosystem is directly tied to the shape of the landscape. Today that shape is dramatically altered, and it is no longer considered a functional system. With every passing year, the dunes look less like they used to.

Wrack Line – Line of debris left on the beach by high tides. Snowy plover forage for small insects here and nest in the open sand above it.

Foredune – Low hummocks of sand parallel to the ocean with scattered driftwood and vegetation. Once European beachgrass is established, hummocks become long ridge up to 25 feet high, impeding movement of sand behind it and altering entire system.

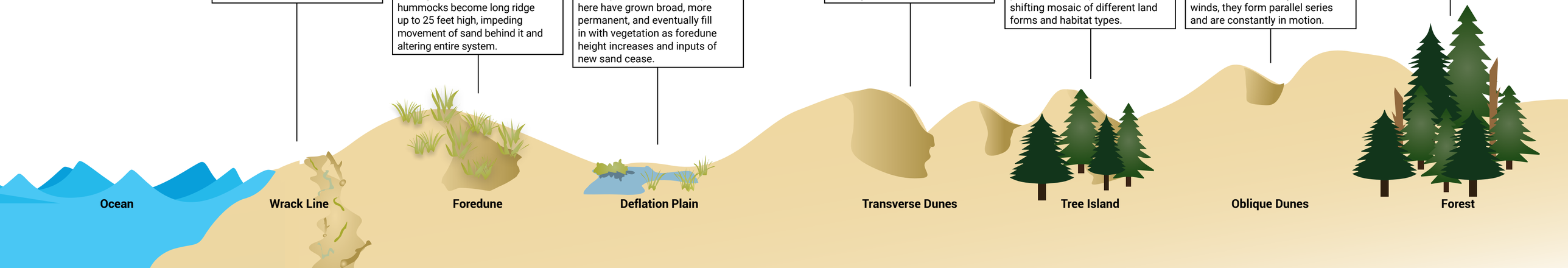
Deflation Plain – Area behind foredune where wind has scoured away sand to the water table. Temporary ponds may form. Once ephemeral, deflation plains here have grown broad, more permanent, and eventually fill in with vegetation as foredune height increases and inputs of new sand cease.

Transverse Dunes – Wave-like ridges created by the dry winds of summer, these dunes rise about six feet and change with shifting winds.

Tree Island – Isolated remnants of coastal forest that have been almost entirely buried by blowing sand. They are proof that in the past this landscape was an ever-shifting mosaic of different land forms and habitat types.

Oblique Dunes – Historically the largest of the dunes formations, these dunes can average 80 to 190 feet high and be a mile long. Most often created by winter winds, they form parallel series and are constantly in motion.

Forest – Evidence of ancient dunes can be found deep beneath the soil here at the edge of the Coast Range mountains.



Winter Lodge of the Umpqua Indians: Sketch from "Scenes and Incidents of Oregon Territory" Frank Leslie's Illustrated Magazine, April 24, 1858.
(Sketch made of Lower Umpqua people held at encampment south of Fort Umpqua prior to being marched to Alsea Subagency at present day Yachats).

A walk through time

The story of the Oregon dunes is also a story about people. For thousands of years, people have found their way to the dunes, attracted to their beauty and richness. It has been a gathering place, and a place of sustenance, a place of internment, and a transportation route, a place of boom, a place of bust, a playground, and a way of life.

Archaeologists have found evidence of humans in Oregon dating as far back as 14,000 years and on the dunes going back 8,000 years. The milder climate and availability of resources in the dunes area is likely to have drawn early people to the sandy shore. In the millennia since then, as sea levels fluctuated, volumes of sand were deposited on now dry land and the dunes expanded. Most signs of early life on the dunes may have washed away or been buried deep below the sand. However, researchers have found some evidence that suggests early people may have fished and collected shellfish along rich coastal estuaries that now lay beneath the dunes. The blowing and shifting sands that make the dunes what they are have obscured all but a few traces of human history. The dunes keep their own time, their own history.

The early people on the dunes were the ancestors of the Siuslaw, Lower Umpqua (Kuitch or Quu'iich), and Coos tribes, who continue to live in the area despite the dramatic changes to their physical and cultural landscape. Today Coos, Lower Umpqua, and Siuslaw people are members of two federally recognized tribes - the Confederated Tribes of Siletz Indians and the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians. Still important territory for these tribes, the dunes provided their ancestors with a wealth of plant resources (including shore lupine, sand verbena, silverweed, evergreen huckleberry, Labrador tea, kinnickinick, and spruce roots) for food, medicine, and basketry, as well as game like deer and elk.

In the late 1700s, the first European explorers began sailing along the Oregon coast, and by the 1800s trappers were scouting and running expeditions on land. These explorations wrought devastation for the Coos, Lower Umpqua, and Siuslaw people, who bore no natural immunity to the diseases carried by Euro-Americans. By the mid-1800s, thousands of coastal Native Americans had died, with tribal populations estimated to be reduced by up to 90 percent.

"Traversing the same footsteps as my ancestors, I continue to gather the same first foods and weaving materials that the dunes have provided my people since time immemorial. Ensuring that the dunes processes are restored will also guarantee the survival of these traditional foods and, thus, the culture of my people."

Ashley Russell, Miluk Coos Tribal Member – Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians, Oregon Dunes Restoration Collaborative member

With settlers sweeping into Oregon and up and down the west coast, investors and entrepreneurs raced to develop trading ports on the dunes. Umpqua City, near the mouth of the Umpqua River, was established in 1850, the first permanent Euro-American settlement in the Oregon dunes. It quickly boasted eleven buildings, including a hotel, post office, and general store. Yet the boom wouldn't last. Eighteen years later, what little was left of the town was abandoned to the sand, with upriver settlements becoming the hubs of local trading.

Despite the severe losses the tribes experienced throughout this period, relations between them and the settlers were largely amicable. In 1855, the Siuslaw, Lower Umpqua, Coos, and other coast tribes signed a treaty with the United States government that would allow settlement of their ancestral lands. In return, the government was to guarantee the tribes a permanent home, access to traditional food sources, and health and education benefits. Congress, however, failed to ratify the treaty and it was never enacted.

Though the treaty signed by the tribes was not ratified, the Coast Reservation (also known as the Siletz Coast Reservation) was formed by executive order in 1855, setting aside over 1.1 million acres for western Oregon tribes, including lands west of the crest of the Oregon Coast Range from Cape Lookout to the Siltcoos River. Eventually, 26 Native American groups from Oregon, Washington, and California were relocated to this reservation.

While the Coast Reservation included traditional territory of the Siuslaw Indians, the same was not true for the Lower Umpqua and Coos people, who initially remained in place. In the spring of 1856, however, they were moved under armed guard to a temporary encampment known as Fort Umpqua, just north of Umpqua City.

Fort Umpqua was one of three forts established near each of the Indian agencies meant to guard the newly established Coast Reservation and the neighboring Grand Ronde Reservation. Indian agencies, which existed throughout the country, were established by the federal government with the intent to implement federal Indian policy on reservations and carry out treaty obligations with tribes. The U. S. Army occupied Fort Umpqua from 1856 to 1862. Reports from 1857 and 1858 estimate 450 Coos and Lower Umpqua Indians were held at the temporary encampment. By 1859, the army began moving Coos and Lower Umpqua Indians from the fort north to the Alsea Sub-agency in Yachats, with the intent that it become their permanent home.

Conditions were terrible at the Alsea Sub-agency, and in the first five years of their resettlement the population was reduced by half. Many fled the reservation because of the conditions, but were routinely captured and forced back by the military.

In 1875, Congress closed the portion of the Coast Reservation that included the Alsea Sub-agency and the northern portion of the dunes and opened it to non-Indian settlement. The tyees, or headmen, of the Siuslaw, Lower Umpqua, and Coos all objected to giving up their lands. "As long as I live on my land," said Tyee John of the Siuslaw Indians, "I am not sorry if I have nothing. My people have all the same mind on this point."

The Lower Umpqua and Coos either went north to the remaining portion of the Siletz Reservation, joined the Siuslaw on the North Fork of the Siuslaw River, or moved back to their homelands to find the land taken by settlers. Sand has buried what remains of the fort, encampment, and Umpqua City, yet the memory of this dark period has not been forgotten by many.

The legacy of Fort Umpqua

Though few obvious physical reminders of Fort Umpqua remain – the buildings having long since been sold, the sand claiming the rest – the complicated legacy of this place lives in the hearts of many whose ancestors once passed through its gates. In 2015, the 37-acre Fort Umpqua site was added to the National Register of Historic Places, acknowledgment of its cultural and historic significance. Now considered an important archaeological site, researchers from Oregon State University and the Siuslaw National Forest, in collaboration with the tribes whose history was shaped there, continue to study this piece of history.

Hospital Row, c. 1859, view from southwest corner of post looking east; hospital in foreground, laundress quarters and bakery in background, photographed by Lt. Lorenzo Lorain (Stephen Beckham, Lonely Outpost: The Army's Fort Umpqua, 1969).

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The challenge of sand

The abundant resources and access to shipping routes continued to attract people to the Oregon dunes in the early 20th century. By 1908, much of the dunes area, along with coastal forests to the north, had been declared part of the Siuslaw National Forest by President Theodore Roosevelt, and homesteading continued for another two decades. The shifting sands proved challenging for homesteaders, though, and many dunes-area claims were abandoned over time.

Transportation was another ongoing challenge. Before the highway came along, stage routes along the beach were often the only way to move people and goods up and down the coast. Horse teams would race the tides, using the firm wet sand as nature's best approximation of pavement. And shifting sands at river mouths created hazards for ship captains, who occasionally found themselves moored on sand and unable to deliver their goods up river.

When Highway 101 was finally completed along the coast in the 1930s, it didn't put an end to the challenges of life on the dunes. Wind-driven sand would bury roadways like drifts of snow. For a region that in the early part of the 20th century was beginning to boom with industry and tourism, the unreliability of life on the dunes was a pressing concern. Starting in the early 1900s, the Siuslaw National Forest joined highway, railroad, and private landowners to look for a way to protect their roads, waterways, homes, and businesses from the blowing and moving sand.

A grass native to Europe and North Africa had proven to be effective at stabilizing sand in coastal habitats both in its native range and in California. The decision was made to introduce European beachgrass to the Oregon dunes with the hopes that, here too, it would hold the sand in place.

Throughout the first half of the 20th century, the Forest Service participated in large scale efforts to colonize the dunes with beachgrass, operating on the then-common belief that this was a prudent and necessary approach. And colonize it did, eventually exceeding their wildest expectations and forever changing life here. It was a decision we continue to live with today – we live with it and it brings us together in surprising ways as we seek new solutions for the 21st century.

© Dina Pavlik

Stabilizing the dunes

Decades ago, the project of dune stabilization is something management agencies were proud to be a part of. This project in 1950 was designed to prevent sand from encroaching on roads, homes, and other development. Working together, the Forest Service, Bureau of Land Management, Soil Conservation Service, State of Oregon Game Commission, Lane County, and Siuslaw Soil Conservation District planted 36 acres of open sand with European beachgrass.

A shifting landscape

THE DUNES HAVE ALWAYS BEEN IN MOTION. THE BUILDING BLOCKS WASHED DOWN THE rivers to the sea, they dried in the sun as the seas receded, and they blew about with the wind. A small sandy peak may be there one day and, given the temperament of the wind overnight, may lay flat by morning. A drift may bury, then uncover, then bury again a bleached log washed ashore in the last winter storm. The wind may scour away sand to reveal a wetland, which, years later, may again be nothing but a dry expanse of windswept sand. It is the ever shifting sands that have shaped the landscape and the life it has sustained.

European beachgrass was one of several non-native species planted to stabilize the dunes beginning in the early days of the 20th century. By the 1930s, it was clear that the imported plant was most effective among them at reducing the movement of sand. It was thriving, and spreading. With its deep rhizomes – underground stems that send out shoots and roots across long distances – the plant was able to out-compete and overtake its cousin, the native and more sparsely growing American dunegrass, as well as other plants unique to the dunes. Planting efforts to continue to stabilize the dunes were conducted in earnest into the 1950s, and occasionally beyond.

Over the course of the last century, people who love the dunes began to see a shift – first subtle, later more pronounced – in the palette of this special place. The expanse of sand – the speckled tan, the pink-purple-yellow – was fading to gray-green, beachgrass green. And over time, an unusual succession was taking place. Where once the wind-driven sand kept the landscape, and the vegetation, in constant flux, the movement had stopped or slowed, and permanent wetlands and woodlands were taking the place of what had once been open sand.

"I fear that by the time my kids are grown, the dunes will be gone. It's sad to think that something this special, that so many people have enjoyed over the years, could cease to exist."

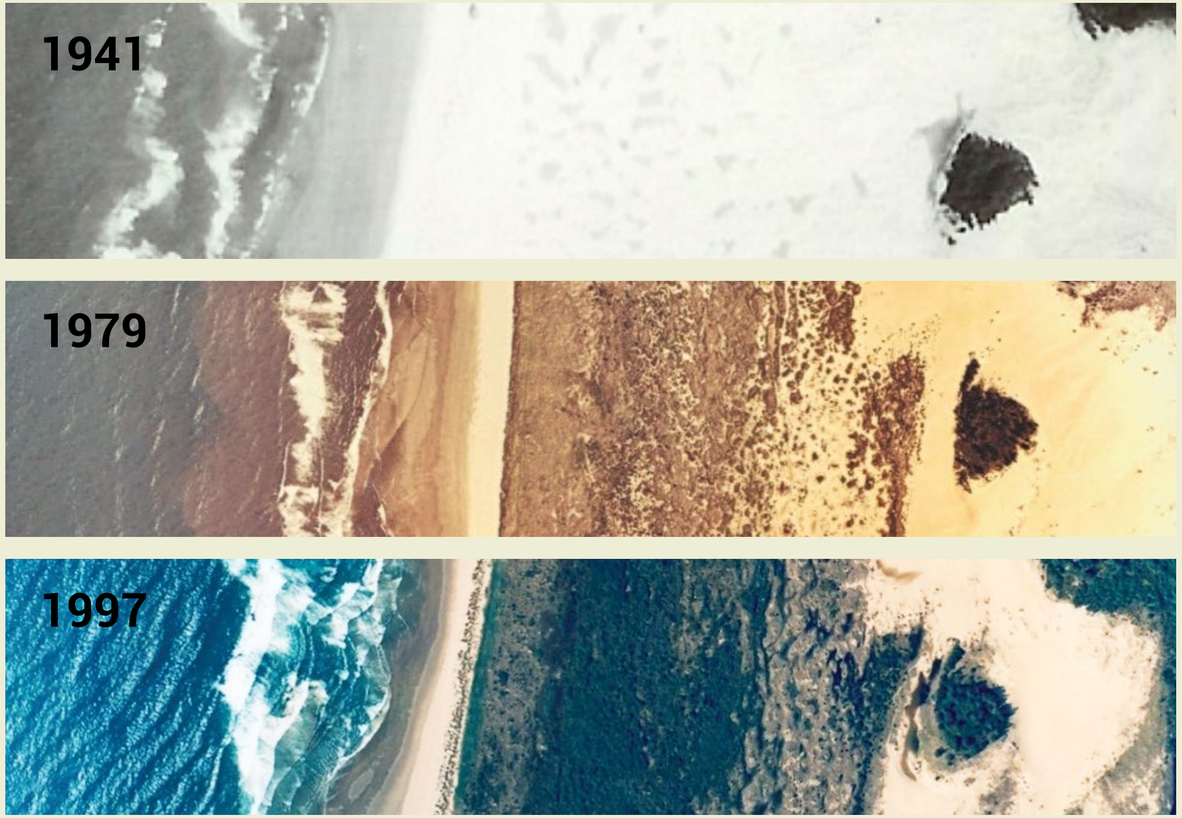
Mike Northrop, retired
U.S. Forest Service,
Oregon Dunes Restoration
Collaborative member

Life on the dunes felt this shift as well. Snowy plover were finding fewer and narrower areas of open sand to raise their young. Predators like coyote were finding it easier to catch dinner on the dunes, the dense vegetation providing cover for them as they hunted and more habitat for their prey; their numbers increased. Wetlands emerged and persisted as larger grass-covered dunes altered how wind touched the land, changing the very structure of the landscape. And new forests cropped up as beachgrass-covered sand provided a new solid foundation on which trees could take hold. Once transient and minor features of the landscape were now prominent, the mosaic altered and now static.

An early resident or settler of the Oregon dunes, visiting today, would find a vastly changed landscape, one where the delicate balance of wind, sand, plants, and animals has been thrown off kilter, where the motion of the dunes has been replaced by the march of beachgrass across the landscape, the unintended consequence of a century-old decision.

A bird's eye view
THE DUNES OVER TIME

Aerial photos from 1941 to 1997 clearly illustrate the changes to the dunes that visitors can see from the popular Oregon Dunes Day Use Site along Highway 101. What decades ago was mostly open sand with an isolated tree island and some sparse vegetation has now become a thick swath of shrubby deflation plain. The tree island is now nearly connected to this new sea of vegetation.



Gaining prominence

Politicians and the public sought national recognition of the Oregon dunes as a special place going back more than half a century. In 1959, Senator Richard Neuberger introduced a bill in Congress that would add the dunes to the National Park system (and thus out of Forest Service management). The bill, and subsequent versions of it, failed to gain traction, in large part because of concerns that such a move would limit public access to what had already become a favorite public playground.

In 1972, Representative John Dellenback introduced a bill in Congress that, when it passed, established the Oregon Dunes National Recreation Area, managed by the Forest Service as part of the Siuslaw National Forest. Why was this bill successful when others were not? Because it not only sought conservation of the dunes' complex ecosystem, but it also highlighted recreation and public enjoyment as a primary purpose of the landscape, and mandated that it be managed with that purpose in mind.

With this congressional act, the Oregon dunes joined other iconic and much loved landscapes across the nation as one deserving of special handling. In the decades since, its national prominence has brought visitors from around the country and beyond to explore and enjoy this magical place.

Life on the dunes

THE OREGON DUNES CONTINUE TO SUPPORT A COLLECTION OF LIFE LIKE NOWHERE ELSE. In many ways, this life looks quite different today than it did 100 years ago – yet all is not lost. There are places a visitor can go today that still resemble the dunes ecosystem that evolved with the sand and wind. And there are new places, ones that exist only because of the interference of man that support rare curiosities, new and rearranged habitat being used by animals in surprising ways.

To understand the dunes today, one must explore all the life it sustains, the life struggling to be sustained in a changed environment, and how the two interact.

Ecologists who have studied the dunes have been surprised by what they find. There are plants that are exceedingly rare and others that have unexpectedly made the shifting sands their home. Pink sand verbena once dotted the open sand beaches, and is now almost non-existent, crowded out by European beachgrass-covered foredunes. Upon close inspection of a sand dune today, a visitor may find a small patch of red fescue or seashore bluegrass, both adapted to this coastal habitat and now a rare reminder of how things used to be.

Today, the spread of European beachgrass, as well as other introduced plant species, threatens the unique plants and patterns of vegetation found on the dunes. As the introduced beachgrass grows, it forms dense mats and hummocks. Its roots go deep – sometimes as deep as 30 feet through the sand to reach the groundwater it needs to survive – and its rhizomes spread across long distances. It is unaffected by mounding sand, giving it an edge over other, less vigorous, native plants. The mats prevent other plants from gaining a foothold and the hummocks catch wind-blown sand, preventing the seasonal movements of sand that for so long defined the dunes. Instead, sand builds up on long, stable dunes that parallel the sea, called foredunes, which further block the wind.

"There are few places where humanity's hand is as evident as it is on the dunes ecosystem. We have a responsibility to preserve what is left and restore what we can so the amazing natural processes and unique plants and wildlife of the dunes can thrive there once more."

Chandra LeGue, Oregon Wild, Oregon Dunes Restoration Collaborative member

Without sand moving across the open landscape, those plants that have evolved with blowing sand begin to disappear, and other plants that require an unmoving surface, moisture, and soil begin to take root. It's a natural form of plant succession, now unnaturally sped up and happening not in small, shifting pockets of dunes but across vast swathes of the landscape.

In the pre-settlement dunes – that is, the dunes before Euro-Americans arrived – and still in select areas today, common species could be found growing in uncommon arrangements or unusual places. Some plant communities (plant species growing in particular environments or in particular collections) exist on the dunes and nowhere else on the planet. Shore pine and bearberry grow side by side, while red fescue and bracken fern keep each other company. While some of these are woodland species, their presence still relies on the movement of sand. Without blowing sand, once only transient woodlands become permanent mature forests and these plant communities are lost.

Just as individual species ought to be preserved for their role in maintaining a healthy and functioning ecosystem, rare plant communities also have an important, and conservation-worthy, role to play. As life on the dunes evolved, organisms – be they animal, lichen, fungi, or other plants – evolved to rely on specific members of their community. When pieces of the puzzle shift or fade away, the whole picture suffers.

Native plant species and communities in decline

PINK SAND VERBENA

Only growing on open sand, this once common wildflower is a federal species of concern and hard to find on the dunes.

GREY BEACH PEA

Adapted for life on the sand, this wooly-leaved legume is increasingly uncommon on the dunes.

SEASHORE BLUEGRASS - SAND FESCUE

Together, these plants grow only on unstabilized sand. Only a few sites remain in the dunes where this pair is found together.

SHORE PINE - BEARBERRY

The individual species are common, yet grow together only on the dunes. Without blowing sand, once transient woodlands now mature into forests, and young woodland communities like this disappear.

Dunes invaders – non-native plant species

EUROPEAN BEACHGRASS

Infamous for its ability to spread, take advantage of limited resources, and crowd out other species, this was originally planted to stabilize the sand to protect built infrastructure. It has drastically altered the dunes landscape. Due to its deep and spreading root system, removal requires years of effort and maintenance.

SCOTCH / SCOT'S BROOM

Its beauty when flowering belies its presence on the dunes as a seed-factory menace. Widespread and well-adapted to the dunes, it's a tough competitor with native species. Many volunteer hours have gone into pulling this weed.

GORSE

With yellow blooms similar to scotch broom, gorse was introduced a century ago and is now widespread. Its seeds can live in the sand for several decades before germinating. The plant itself can re-sprout when cut, making it a tough one to remove.

Animals are a critical part of the dunes ecosystem as well and, like the plants, their habitat also has been in flux. Over 400 wildlife species call the dunes home. Once territory for a large population of western snowy plover, this small shorebird is now threatened, its numbers having dwindled up and down the entire Pacific coast. Requiring open sand near the shoreline for nesting, snowy plovers have increasingly struggled to find a home suitable for raising their young. As the European beachgrass has taken hold, the important habitat the dunes have historically provided has been rapidly shrinking.

Even more rare than the plover, the world's fastest known beetle – the Siuslaw hairy-necked tiger beetle – is found almost exclusively along the Oregon coast. Their very existence is imperiled by the loss of the open sand, a critical part of their small habitat.

Complicating this picture of the changing, declining dunes is the elusive Humboldt marten, a member of the weasel family. Its usual habitat in the forests and broad inland shrublands of the Oregon coast has dwindled as forest management practices changed over time and the land was developed; so too have populations of this small and charismatic hunter been shrinking. In 2015 and 2016, surveys conducted by wildlife biologists unexpectedly found none of the rare martens in coastal Oregon forests. Yet, surprisingly, a number of martens were discovered in the newer deflation plain shrublands of the Oregon dunes, a promising sign for an animal increasingly imperiled.

These dense shrublands – thick with evergreen huckleberry, salal, and wax myrtle and cousin to large shrubby swathes previously found further inland - were once found only in patches across the dunes landscape. Now covering large expanses of the spreading deflation plain, the shrublands are providing refuge for a predator that has lost most of its historic inland habitat – perhaps a bright light among the storm clouds of a rapidly changing place.

Wildlife of the dunes

Some of these native species have suffered as a result of habitat loss. From bears to beetles, the dunes support many fascinating animals.

SIUSLAW HAIRY-NECKED TIGER BEETLE

This fast-moving predatory beetle that inhabits sandy areas where freshwater flows into the ocean once ranged from California to Washington. Habitat loss has drastically decreased their numbers.

INSULAR BLUE BUTTERFLY

Relying on beach clover for food and shelter, this delicate butterfly is declining, along with its host plant, due to the loss of open sand.

WESTERN SNOWY PLOVER

Threatened throughout its range, this small shorebird has been impacted by the loss of open sand and disturbance by people. Restoration of the dunes is critical to the recovery of this species.

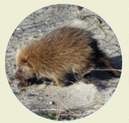
HUMBOLDT MARTEN

Recently found to be inhabiting shrubby areas of the dunes, this typically forest dwelling animal eats small mammals and berries. A lucky visitor may find them warming in the sun following a storm.

BLACK BEAR

Not what most people would expect to see lumbering across a sand dune, black bears find berries, nuts, small mammals, and other tasty treats among the shrublands of the dunes.

PORCUPINE



Typically considered a forest dweller, but now rare in many parts of Oregon, it is a special experience to find a porcupine waddling across the sand in search of salty, succulent dunes plants.

Moving in

Human-caused changes to the dunes have made the landscape more attractive to some animals than before. Adaptable and impressive animals in their own right, they are unwittingly impacting the ecology of the dunes.

CROWS, JAYS, RAVENS

Collectively called corvids, these birds are smart, resourceful scavengers. Attracted to food scraps left by people, they often turn their attention to eggs and chicks of snowy plovers and other native birds.

OPOSSUMS, RACCOONS

Opossums were introduced a century ago. Along with raccoons, they are savvy scavengers who will feast upon many things they come across, including fruit, nuts, carrion, birds, and eggs.

COYOTES

Always a resident of the dunes, the number of these adaptable hunters is increasing as they find more prey among the European beachgrass. Plover and marten are a delicacy for these wily animals as well.

The dunes today

THE PACE OF CHANGE ON THE OREGON DUNES RUSHES FORWARD. ONCE MOVING IN geologic time, then keeping pace with early settlement, the last 50 years have seen dramatic changes on the sand. The spread of invasive species across the dunes has unexpectedly changed the course of history for this sandy landscape, and the plants, animals, and people who live and play here. Technology, too, has changed how people experience the dunes. No longer is the sand an obstacle for travel. Today, people flock from around the globe to try their hand at riding the dunes.

Off-highway vehicles – once single-person buggies, now powerful vehicles that carry two, four, even 20 people – are the preferred mode of transportation for many dunes lovers. They fly across the sand, sometimes making death-defying leaps off the tops of dunes or charging down sandy slopes that aren't for the faint of heart. Some are ridden by thrill-seekers, others by families enjoying a day near the sea. They are a way of life for many, and an important economic driver in the small communities that dot the dunes.

Dunes riders may be the first to note how Oregon's dunes have changed in just their lifetime. The thrills of riding the dunes are found on the open sand, which has been diminishing as European beachgrass and other invasive species continue their march across the dunes. Riders and ecologists together see that the open sand is shrinking, and shrinking at an ever increasing rate.

In the last decade, riders, hikers, communities, and neighbors began voicing their concerns about the disappearing sand. They'd become alarmed by the speed with which a handful of plants are sweeping the dunes and changing its life, the opportunities it provides, its very structure.

"The first time I saw the dunes, I was questioning my decision to move to the coast. But as I stepped out of my car and looked out onto the endless sand dunes and glistening ocean, a sense of calm washed over me and I knew I was home. I couldn't wait to explore my new backyard."

Ana Hernandez, Siuslaw National Forest, Oregon Dunes Restoration Collaborative member

Land managers have felt this change too. Coastal campgrounds are flooding more frequently in the winter, caused in part by the changing pattern of the landscape – the inundation damaging facilities and preventing use by visitors. And the Forest Service, tasked with working to recover the dunes' population of snowy plover and committed to providing recreation for dunes riders, has struggled to provide for all, given the ever-shrinking resource. Attempts to reclaim some of the sand by knocking back European beachgrass have been moderately successful, yet require ongoing maintenance and are but a small drop in the bucket of this vast landscape.

In recent years, what began as an asterisk, a side note in a conversation about the Oregon dunes, became the main idea. Disparate voices began asking hard questions about this special place: Can we slow the changes on the dunes? Can we help snowy plover while also improving opportunities to ride the dunes? Can we give the wind reign over the sand again without burying development? Can we breathe new life into this ecosystem that humans have lived on and loved for centuries?

Out of the crowd of voices, a common theme started to emerge: We need to save the dunes. And then, in 2014, the crowd looked at the landscape, looked at each other, and collectively realized if they worked together, they could save the dunes.

A success story at the Oregon Dunes Day Use Site

The Forest Service and partners initiated a 500-acre restoration project here in 1998. Over several years, they attacked invasive species using a variety of tools, including prescribed fire, targeted herbicide application, hand-pulling, and bulldozing. Through a series of treatments and ongoing maintenance, enough open sand habitat has been re-established to successfully reintroduce pink sand verbena and to attract nesting snowy plovers.

The dunes restoration collaborative strategy

IN 2014, SIUSLAW NATIONAL FOREST STAFF CONVENED A GROUP OF STAKEHOLDERS WHO were concerned about the future of the Oregon dunes. Some had already been talking about the need to restore the dunes, others cared for this special place and were just beginning to learn about its uncertain future. Between field trips and work sessions over the next two years, the group developed a strategy for how to best tackle the challenges facing the dunes. Recognizing that addressing the issue will be complex, expensive, long term, and that the need is urgent, the strategy provides a road map for a coordinated dunes restoration effort.

The Oregon Dunes Restoration Collaborative was born out of the realization that without prompt action, the dunes as we know it would disappear completely, and that the task is too large to go at it alone. Individuals and groups found a common goal to rally around – bring back the wind-blown sand of the dunes, the native plants, and the unique wildlife by eliminating and controlling invasive species, by preserving the best remaining examples of a healthy dunes ecosystem, and by restoring critical areas and geologic processes. It was a goal that OHV riders, wilderness advocates, elected officials, and others could get behind with one voice.

Early discussions among the collaborative group members about how to develop a strategy eventually coalesced into five key features they felt it must embody in order to be successful. They agreed that in order have a noticeable impact on the landscape, the restoration goals need to be realistic and adaptable, developed collaboratively, shared with the community, and that as a group they must be persistent in the face of roadblocks. Taking a lesson from the European beachgrass, the hope is this grassroots effort will grow and spread and eventually change the landscape.

"The Oregon dunes are incredibly special, the type of place that is worth the effort to restore. Having grown up here, I feel a connection to the dunes and I'm grateful that I'm now in a position to help care for, restore, and protect this land."

Garrit Craig, Siuslaw National Forest

Once the guiding principles were established, the collaborative group then identified three goals to provide overall direction for dunes restoration, defining the scope and scale of the effort as well as what conditions on the land they hope to achieve. The idea is that some restoration projects will be designed to preserve areas that still retain the features of a functional dunes ecosystem, some will be small scale efforts to restore conditions in critical areas, and others will be large scale projects intended to reshape portions of the landscape to something resembling what it once was.

In order to move from these broad goals to on-the-ground restoration projects, the collaborative group developed a process to identify and prioritize opportunities. Using local and expert knowledge of the entire dunes landscape, they defined potential project areas according to the restoration need and desired outcome. From there, the group used a set of criteria to determine which areas should be their initial priority focus, and which they considered longer term goals. By considering things like the existing condition on the ground, wildlife habitat needs, and potential for community involvement, they were able to determine which opportunities have the highest likelihood of early success, and which are most urgently needed.

Today, the group works with the Forest Service to develop restoration project ideas, raises public awareness of the need for dunes restoration, and seeks funding opportunities and other support to achieve their goals.

Restoring the dunes will be a decades-long effort, and the Oregon Dunes Restoration Collaborative is in it for the long haul, sustained by the passion of those whose hearts and minds are connected to this special place. The dunes may never fully shake the scourge of European beachgrass and the other invaders that have so changed this place, but by coming together there is bright hope that we can begin to make a dent in it, to crack open some windows and let in the sand, wind, and misty ocean air, so that our grandchildren may enjoy this place as we have.

The three goals of the dunes restoration strategy

1

PRESERVE THE BEST

Maintain and protect existing areas known to be in a healthy, natural condition. Examples may include areas that have functioning open sand, viable native plant communities, or resilient wildlife habitat.

2

RESTORE SITE-SPECIFIC CONDITIONS AND PROCESSES

Restore and maintain smaller areas to improve natural conditions at a local level. Site-specific locations may include a beach selected for its value to a population of nesting snowy plover, a scenic stretch of trail, or a specific dune formation that has critical value to the bigger landscape.

3

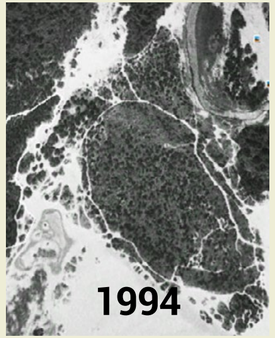
RESTORE LANDSCAPE-SCALE NATURAL PROCESSES

Create and maintain areas where there is a high likelihood that restoration of natural processes and a natural landscape pattern will be successful. Natural processes and patterns include sand movement and deposition and the resulting shifting mosaic of open sand, dune formations, plant communities, and tree islands.

Restoration Test Case

REWINDING THE CLOCK TO ESTABLISH MORE OPEN SAND AT SPINREEL BEACH

Through a combination of bulldozing European beachgrass, hand-pulling Scotch broom and young shore pine, and prescribed burning, 30 acres of open sand were momentarily regained. Without ongoing maintenance, however, by 2012 regrowth of beachgrass was already evident.



You're invited! The Oregon Dunes Restoration Collaborative

The Oregon Dunes Restoration Collaborative's mission is to collaboratively support, guide, and promote Oregon dunes restoration and preservation of the open sand, unique habitats, and dunes processes that benefit the plants, animals, and people that live and play in this special place.

At quarterly meetings, field trips, and among a range of working committees, the group is actively developing ideas for restoration projects, pursuing funding opportunities, and engaging with the community to share this story. Group members host volunteer work days to pull invasive species, speak to community groups, and participate in local events to share why they love the dunes and what they're doing to save them. Anyone who cares about the future of the Oregon dunes is invited to join the collaborative, where a diversity of voices is welcome and encouraged.

Meetings are open to all and membership simply means showing up and getting involved. While this list is not all inclusive, it contains those individuals and organizations that have been critical to the process of developing the Oregon dunes restoration strategy.

- Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians
- Douglas County Board of Commissioners
- Lane County Board of Commissioners
- Office of Senator Jeff Merkley
- Office of Senator Ron Wyden
- Oregon Wild
- Save the Riders Dunes
- Siuslaw National Forest
- Siuslaw Watershed Council
- Travel Lane County
- And numerous concerned citizens and volunteers.

What can I do to save the dunes?

Restoring the dunes is a big job. It will take all of us to make a difference. Here's what you can do to help.

- Volunteer for stewardship activities on the dunes.
- Spread the word.
- Love and care for your Oregon dunes.
- Join the Oregon Dunes Restoration Collaborative.

For more information visit SaveOregonDunes.org.


OREGON DUNES RESTORATION COLLABORATIVE