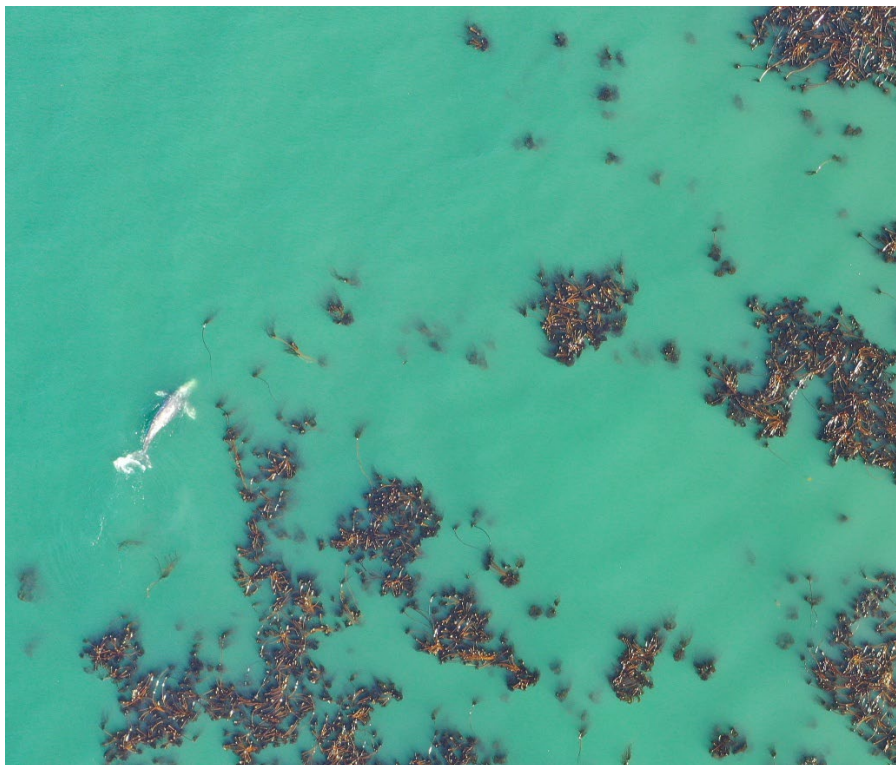


Nature Trails

Published by the Eugene Natural History Society

Volume 59, Number 4, April 2025

The Eugene Natural History Society is based out of the traditional homelands of the Kalapuya peoples, most of whom are citizens of the Confederated Tribes of Grand Ronde and the Confederated Tribes of Siletz Indians. These Indigenous people stewarded this land for millennia and continue to play an active role in local communities. We commit to supporting the many Tribes and Indigenous scholars and organizations working to shape the future of these lands and waters that we mutually cherish.



Grey whale forages in a kelp forest near Depoe Bay, Oregon. September 2023. *Sara Hamilton*

The Oregon Kelp Forest Stewardship Initiative

(co-sponsored with the Emerald Chapter of the Native Plant Society of Oregon)

Sara Hamilton, PhD

Science Coordinator, Oregon Kelp Alliance, Port Orford

Friday, 18 April 2025, 7:00 pm

This month's meeting will be a hybrid of in person and real-time Zoom. The in-person lecture will be held at 7:00 in 221 Allen Hall, University of Oregon campus. **Snacks provided!** The Zoom lecture link is <https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUeJuU21wT20rdz09> or see our website at <https://eugenenaturalhistorysociety.org/>

This Month's Speaker: Sara Hamilton



While many of us in Oregon enjoy walking among the forests of Oregon, few of us have been so lucky as to walk on the seafloor through the kelp forests of the Oregon coast. Dr. Sara Hamilton is one of those lucky ones or maybe not so lucky ones, depending on the day. When asked about her fieldwork she described how diving off the Oregon coast in good weather can be one of the best experiences, with visibility for miles, incredible colors, tufted puffins, whales, anemones, and sunflower sea stars. She also described days when the water is so murky you can't see past your own hands and the rough waters toss you into dense patches of spiny urchins. Undeterred by these days, which she characterized as a bit "terrifying and uncomfortable," she is still excited about and committed to her work in these underwater "forests."

Sara's interest in diving started in warmer waters, during a college trip to the Florida Everglades where she got the opportunity to try snorkeling. Growing up in the Appalachian region of Virginia, far from the ocean, this trip to Florida started her on her oceanic career. Throughout her undergraduate degree at Bowdoin College in Maine, she explored the Atlantic coastline while exploring gender studies and studying biology with a focus on plant ecology. She continued to pursue her love of diving during a study abroad program in the Caribbean.

After her undergraduate degree, Sara headed to yet another coastline, moving to Corvallis to pursue a Ph.D. degree at Oregon State

University. Under the mentorship of Dr. Bruce Menge and Dr. Kirsten Grorud-Colvert, Sara arrived at OSU poised to join other members of the lab who were studying rockfish larvae, but she quickly decided to branch out into areas of the ocean that were less well studied. Although most ecology students are introduced to kelp as an organism early in their education through the commonly used example of otters as keystone species in kelp forests, Sara found that kelp was rarely studied in Oregon. She was excited to fill in these gaps in scientific understanding, and her undergraduate experience with remote sensing made her the perfect candidate to study these vast and difficult to access taxa. For her dissertation, Sara used satellite data to determine how kelp forests were changing over time and what drivers were impacting them. She also began branching into more applied science, coauthoring a successful proposal to list sunflower sea stars as critically endangered on the IUCN Red List. During her dissertation work she started collaborating with the Oregon Kelp Alliance (ORKA), where she now works.

Since starting at ORKA full time in 2023, Sara has spearheaded funding drives to continue remote sensing work, this time by drone, and enjoys bringing her ideas to communities in southern Oregon and beyond through science communication and collaboration. She names the drone project as one of her favorites. Aside from their benefits to scientific research, drone surveys performed above the kelp forests quite literally provide a perspective that is largely unknown to many people, a perspective that Sara is eager to share with everyone willing to watch and listen. She loves public speaking and is constantly seeking out new opportunities to spread the word about the enchanting qualities of these hidden forests and the need for their conservation.

One of the many groups ORKA collaborates with is the Coquille Indian Tribe. Although there is a lot of ground still left to cover in terms of tribal access to marine environments, Sara is inspired by unique perspectives and passion that Coquille members bring to coastal stewardship. ORKA is facilitating greater tribal food sovereignty by helping tribal members become SCUBA certified to be able to harvest urchins and other ocean foods. Working and diving with



Diver with red urchin, Nellies Cove, Port Orford, 2021. Justin Myers

tribal members, Sara has been able to learn more about many marine organisms, including her favorite, the abalone, which feeds on kelp and whose shell is commonly used for tribal jewelry and regalia.

Many questions relating to Oregon's kelp forests remain unanswered or poorly studied. For example, what role does ocean temperature play in the decline of these forests? How many urchins do divers or tribal members need to harvest to protect kelp from further declines? These knowledge gaps still exist because the kelp forests are understudied compared with many other types of habitats. Although there is a lot of concern for the future of these ecosystems, Sara emphasized that there are positive developments year to year and so much more to learn.

Join us for a lively deep dive (literally!) into the world of kelp forests as Dr. Sara Hamilton shares her amazing imagery and research of Oregon's kelp forests Friday, April 18, at 7 pm in 221 Allen Hall on the UO campus (there will be cookies!) or directly from this Zoom link: <https://zoom.us/j/97499095971>

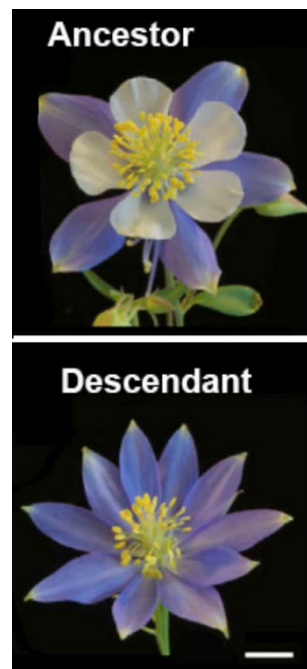
—Sarah Erskine and Angela Soto

The Hopeful Monster

by Stan Sessions and Chuck Kimmel
(after fun discussions and too much coffee)

Over 80 years ago Richard Goldschmidt proposed the controversial idea that evolution of a new species can occur in one fell swoop caused by a single mutation with very large effect, creating what he called a “hopeful monster.” This hypothesis contrasts with the prevailing Darwinian understanding of species originating by the cumulative effect of many small mutations occurring gradually over long periods of time. Large effect mutations, it was correctly argued, were usually lethal because of very abnormal development. Such mutations should produce hopeless, not hopeful, monsters.

The hopeful monster hypothesis was ridiculed at the time it was presented, but current understanding of the evolution of development (“EvoDevo”) gives it some merit. The hypothesis suggests that a novel “monstrous” phenotype (appearance, behavior, etc.) can be caused by a single genetic change. A recent supporting case was reported by Scott Hodges's group at Santa Barbara in 2022. That study was conducted with a so-called homeotic mutant of the Colorado blue columbine.



Scott Hodges

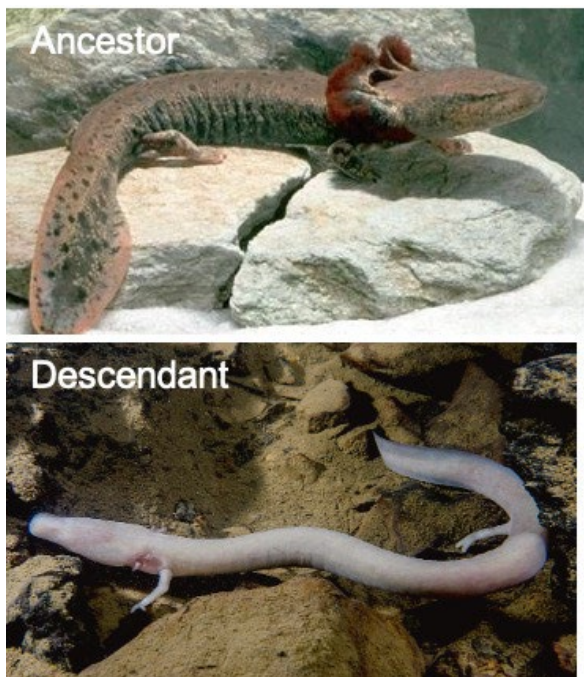
The mutation occurred in a “natural” population and seems to be adaptive for the new form. Evidence suggested that the key genetic change was a mutation of a single gene (*APETALA3*) with a major phenotypic effect. Normally the columbine flower includes a single whorl of five petals inside a single whorl of five sepals (two whorls, 10 elements). In the mutant there are still two whorls and 10

elements, but both whorls develop sepals and there are no petals at all! This change has reproductive (fitness) importance because it benefits certain pollinators. The authors concluded that the “findings fit well into the concept of a ‘hopeful monster’ ... where major

morphological shifts that delineate taxa arise in a single step.” This interpretation is extremely well supported by the data.

To our knowledge there are no comparable published studies of animals that so clearly support the hypothesis. However, we have found a few cases, including among salamanders (a group with which we happen to be most familiar), that are potential candidates. Consider the cave-dwelling salamander *Proteus anguinus* (the olm) found in the Karst region of southeastern Europe. This creature seems truly monstrous in spite of being relatively small, with a long, slender, worm-like body and a protruding snout packed with receptors sensitive to smell and vibration (recall the ENHS talk in May 2021 presented by Stan and his Slovenian colleague Lila Bizjak-Mali).

Proteus is ghostly pale with almost no visible pigment in its skin. Its degenerate eyes are covered with skin, which renders the animal blind even in the light. Its feet have three toes on the front legs and only two on the hind legs, not the four or five found in most salamanders. Clearly several important structures and functions have changed in *Proteus* compared with its closest relative, the aquatic but surface-dwelling species of the genus *Necturus*, which are thought to resemble the ancestral condition. Some of these changes are similar to ones



Stan Sessions, Domin Dalessi

known to be caused by mutation in sonic hedgehog (*shh*), a developmentally important gene known to be involved in cave adaptation in other animals. Could all of those phenotypic changes come from a single genetic event *à la* our hero of this article, Goldschmidt? We think possibly. How can it be that a single change in genotype can produce a diverse array of phenotypic novelties? One explanation was provided by Goldschmidt. Even though he worked long before Watson and Crick nailed DNA as the genetic material, Goldschmidt proposed the notion that besides large effect mutations involving only single genes (such as *APETALA3*), there are also single mutations of large genetic regions and phenotypic effects that involve major changes in chromosomal structure, not just disruption of a single gene. He termed these kinds of mutations systemic.

Today, nearly a century later, we have an excellent understanding of what Goldschmidt thought of as systemic mutations. Chromosomes can undergo rearrangement. For example, pieces of one chromosome might translocate to another chromosome, sometimes interrupting the interactions of genes. Two whole chromosomes might join end to end, or a portion of a single chromosome might undergo an inversion. Often such chromosomal changes are involved in cancer or other disease. But occasionally they seem to be related to adaptive evolutionary changes.

For an interesting case in point consider the sex life of our cave-dwelling *Proteus*. Imagine a small ancestral population isolated in a dark underground refuge. Now imagine a novel form, the “monster,” arising in this population by a systemic mutation, perhaps involving a gene such as *shh*. This creature might be so monstrous that it would be unable to find a mate, especially in the dark. However, a chromosomal translocation appears to have saved the day! In 2016, Stan and Lila reported that the pair of female- and male-determining sex chromosomes (corresponding to the X and Y sex chromosomes of humans) joined together in the ancestor of cave-dwelling *Proteus*. A single individual inheriting the fused XY chromosome can produce both eggs and sperm—the monster is a hermaphrodite that can potentially fertilize itself! No need to grope in the dark for a salamander

sex partner. In theory, the translocation produced hopeful rather than hopeless monsters.

We have saved the *pièce de résistance* for last. Humans have 23 pairs of chromosomes. But our closest ape relatives—chimps, gorillas, and orangutans—all have 24 pairs. As we learned from reading an on-line blog, “When Did Chromosome 2 Fuse,” written by the University of Wisconsin physical anthropologist John Hawks, the evolutionary reduction from 24 to 23 chromosomes is due to chromosomal fusion. Two smaller chromosomes joined to make a single larger one. Voila! A novel chromosome, “chromosome 2.” Results of comparative studies of DNA recovered from fossils suggest that the fusion occurred about 1 million years ago in *Homo erectus*, the astonishingly successful hominin lineage that was the common ancestor of both *Homo neanderthalensis* and the extant *Homo sapiens*. Did our own big-brained species evolve from a swollen-headed hopeful monster? Possibly.



Upcoming ENHS Business Meeting

The May ENHS presentation by Clara Bird will include our short annual **Business Meeting**. Members will be asked to vote on whether to accept the slate of board officers for 2025–2026, which will be published in the May issue of *Nature Trails*.

Upcoming Events

(for complete listings and details, see individual websites)

- **McKenzie River Trust** <https://mckenzieriver.org/events/#event-listings> or 541-345-2799
 - Weekly, 9–11:30am. Watershed Wednesdays at Green Island.** Volunteer projects include invasive species removal, habitat care, planting, and tree establishment. [Sign up](#)
 - Second Saturdays, 8am–4pm, Mar.–Dec. Living River Exploration Day at Green Island.** We open the gates to this conservation area and welcome our community to explore this special place. Free, no preregistration required. Please review the visitor guidelines: <https://mckenzieriver.org/living-river-exploration-days/>
 - Wednesday, 23 Apr., 5–8pm. Oakshire Inspires: Benefit for MRT.** Raise a glass to the McKenzie River, the source of our drinking water and the water in Oakshire’s award-winning beers. Nonalcoholic drinks also available. \$1 of every pint sold will go to support MRT. Live music included. Oakshire Public House, 207 Madison, Eugene.
 - Saturday, 26 Apr., 9–11am. Secrets of the Oregon Dunes.** Join local experts Dina Pavlis and Armand Rebischke and learn how the Oregon dunes were formed, why they’re disappearing, and how you can help save them. [Sign Up](#)
 - Thursday, 1 May, 10am–1pm. Birds, Bees, and Blooms at the Confluence.** Embrace the spirit of May Day with local ecologist Bruce Newhouse on an immersive exploration of the Willamette Confluence. [Sign Up](#)

- **Native Plant Society of Oregon, Emerald Chapter** <https://emerald.npsoregon.org/>
Saturday, 26 Apr., 9:30–11:30am. Prairie Plant Research and Restoration at Wild Iris Ridge. Join UO ecologists Katelin Kutella and Sarah Erskine to tour an experimental prairie research site at Wild Iris Ridge. Meet at Bailey View Drive trailhead for a short walk to the plot. Sign up [here](#)
- **Mt. Pisgah Arboretum** <https://mountpisgaharboretum.com> or 541-747-3817.
Saturday, 19 Apr., noon–5pm. TransWild Forest Frolic. Join [TransPonder](#), [Cascadia Wildlands](#), and MPA in welcoming people from queer, trans, BIPOC, and other marginalized communities for a FREE afternoon of outdoor workshops, nature walks, live music, activities, and more! All ages. More info at: <https://transponder.community/events/event/transwild2025/>
Saturday, 26 Apr., 9am–noon. Earth Day Celebration. Work parties for all ages and abilities, wildflower walks, crafts and nature education activities, tree climbing for kids provided by Eugene Tree Climbing, and more! A light lunch will be provided when the fun wraps up. Free and family friendly.
- **Lane County Audubon Society** www.laneaudubon.org or 541-485-BIRD; maeveanddick@q.com or 541-343-8664
Saturday, 19 Apr., 8–11am. Third Saturday Bird Walk. Open to all. Contact tolalla@gmail.com.
Tuesday, 22 Apr., 7–8:30pm. The Monarch Butterfly’s Phenomenal Journey. Sue Anderson will explain the Monarch’s life cycle and migration timetable with details about how they navigate, including maps of the range of the mostly distinct Eastern and Western Monarch populations. Zoom (see website for link) and in person, Campbell Community Center, 155 High St., Eugene.
Saturday, 3 May, 8–11am. First Saturday Bird Walk. Contact Sarah at 1stsaturdaybirdwalks@laneaudubon.org
- **Lane County Butterfly Club** <https://www.lanebutterflies.org>
Tuesday, 6 May, 7:15pm. Finding Lane County Butterflies—The How, the When, and the Where.
Presenter: Neil Bjorklund. Hilyard Community Center, 2580 Hilyard St., Eugene.
Saturday, 17 May, 1–3pm. Field Trip on the East Side of Buford Park. Leaders: Sue Anderson and Lori Humphreys.
- **Museum of Natural and Cultural History, University of Oregon** <https://mnch.uoregon.edu/museum-home>
Ongoing exhibits: Roots and Resilience: Chinese American Heritage in Oregon; Hostile Terrain 94; Oregon—Where Past Is Present.
Tuesday, 22 Apr., 10am–5pm. Earth Day Celebration. Free.
Thursday, 15 May, 6–7:30pm. Transgressors. Opening night of this new exhibit, presenting now and future Indigiqueer ancestors who move beyond boundaries in life and art.
- **Nearby Nature** <https://www.nearbynature.org/> or 541-687-9699, 622 Day Island Rd., Eugene (Alton Baker Park)
Monday, Wednesday, Friday mornings. Wonder Keepers. Preschool program outdoors in our Learnscape.
Tuesdays and/or Fridays afternoons. Natural Neighbors. After-school program outdoors in our Learnscape.
Tuesday, 22 Apr., 10am–1pm. Earth Day Park Cleanup with SOLVE. Annual cleanup of Alton Baker Park.
Thursday, 24 Apr., 9–11am. BioBlitz 2025: Whilamut. We will use iNaturalist to collect observations of the web of life in the Whilamut Natural Area and our Learnscape. Work with a small group and a knowledgeable leader.
Saturday, 26 Apr., 8–10am. BioBlitz 2025: Tugman Park. We will use iNaturalist to collect observations of the web of life at Tugman Park. Work with a small group and a knowledgeable leader.
Saturday, 26 Apr., 10am–noon. 10th Annual Wow! Newts! Nature Quest. Learn all about newts from naturalist **Tom Titus** as we count these cool critters in Tugman Park’s creek. Meet outside the Tugman Park picnic shelter. Nearby Nature members FREE, nonmembers \$10/family. Preregister online.
Tuesday, 13 May, 10–11:30am. Green Start Play Day: Rainbow Party in our Learnscape. Kids 5 and under only, with an adult. Members FREE, nonmembers \$10/family. Register online.

ENHS MEMBERSHIP FORM

Name _____

Address _____

City _____ State & Zip _____

Phone _____

Please choose: receive *NT* by e-mail _____ or by USPS _____

Remember: Electronic copies come to you in **color with live links and save paper and postage!**

E-mail address for electronic *NT* _____

ANNUAL DUES:

Individual	\$15.00
Family	25.00
Life Membership	300.00
Other Contribution	_____

Make checks payable to ENHS or pay electronically on our website →

Mail checks to:

ENHS
P.O. Box 5494
Eugene, OR 97405

Fill out the form or go to our website (see QR code below) to join and pay by check or electronically. Membership payments allow us to give modest honoraria to our speakers and pay for the printing and mailing of *Nature Trails*. Find us at:

<http://eugenenaturalhistorysociety.org/>

and

https://www.youtube.com/channel/UCEr_yzVh9lw9y-nLS_t94BVw



Kelps provide food to myriad species; this isopod is grazing on a bull kelp. August 2018. Sara Hamilton

Eugene Natural History Society
P.O. Box 5494
Eugene, OR 97405

Monthly meetings:

When: September–May: third Friday;

December: second Friday

Where: 221 Allen Hall (UO campus)

and/or on Zoom at

<https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUeJuU2lwT20rdz09>

Time: 7:00 pm

Parking for UO events is available at the UO Physical Plant lot: From Franklin, turn north onto Onyx, go 1 block to the lot.

After 6pm, it's open to the public.

See our website for more details.

<http://eugenenaturalhistorysociety.org/>

ENHS Officers and Board Members 2024–2025

President: Stan Sessions sessionss@hartwick.edu

Vice President: Tom Titus tomtitus@tomtitus.com

Secretary: Monica Farris

Treasurer: Judi Horstmann horstmann529@comcast.net

Board: John Carter, Tim Godsil, August Jackson, Chuck Kimmel, Reida Kimmel, Kris Kirkeby, Alicia McGraw,

Dave Wagner, Dean Walton, Kim Wollter

Website: Tim Godsil tgodsil@uoregon.edu

Nature Trails editor: Kim Wollter kwollter@comcast.net

2024–2025 Speakers and Topics

20 Sept.	Patty Garvey-Darda	Why Did the Ecosystem Cross the Road?
18 Oct.	David Mildrexler	An Enduring Conservation Vision for the Blue Mountains Ecoregion
15 Nov.	David G. Lewis	Tribal Histories of the Willamette Valley: Reconstructing Traditional Environments
13 Dec.	Michael Murphy	The Modern Bird World ... Living for the City (co-sponsored with the Lane County Audubon Society)
17 Jan.	Charles Lefevre	Diversity and Domestication of North America's Native Truffles
21 Feb.	David Paul Bayles	In Trees I Trust
21 Mar.	Nina Ferrari	Into the Third Dimension: Understanding Vertical Distributions of Birds in Old-Growth Forests
18 Apr.	Sara Hamilton	The Oregon Kelp Forest Stewardship Initiative (co-sponsored with the Emerald Chapter of the Native Plant Society of Oregon)
16 May	Clara Bird	Gray Whale Foraging Behavior