so researchers can use positive S-target hits as a proxy to quickly map the spread of B.1.617.2, without needing to sequence samples fully. Both S-gene tests and more detailed sequencing data from virus samples collected in the United Kingdom indicate that B.1.617.2 is outcompeting the two other B.1.617 subtypes, and replacing B.1.1.7 – a variant identified in southeast England in late 2020 – as the most common variant driving new infections in the country.

"Across all of England now, we would expect that 50% of infections would be the [B.1.617.2] variant," says Tom Wenseleers, a biologist at the Catholic University of Leuven in Belgium who is tracking the figures. An analysis of UK sequencing data that he shared online suggests that numbers of B.1.617.2 infections could be growing 13% faster than B.1.1.7 infections each day (see go.nature.com/3wav3bx).

In a report published on 12 May, A UK government advisory committee called the Scientific Pandemic Influenza Group on Modelling, Operational subgroup said there is a "realistic possibility" that B.1.617.2 is 50% more transmissible than B.1.1.7, according to the available data (see go.nature.com/3oyxtgz).

"The prediction of 50% more transmissible sounds entirely plausible," says Sharon Peacock, a microbiologist at the University of Cambridge, UK, who leads the COVID-19 Genomics UK consortium. "I think as data goes up more, we'll get more confidence in that, but you can't really ignore what's happening."

### Immune escape

Another question researchers are keen to resolve is whether vaccines will remain effective against the B.1.617 variants. If any of these strains can evade the immune protection conferred by vaccination, or by previous exposure to the virus, they could derail plans to relax lockdowns and other restrictions.

In theory, the accelerated spread of B.1.617.2 in the United Kingdom – where more than 50% of the population has received at least one dose of a COVID-19 vaccine – could indicate an ability to escape vaccine protection. But Wenseleers says there is little evidence that vaccine escape is driving the increase in cases. Preliminary data from Bolton, an outbreak hotspot in northwest England, from mid-May showed that most people there who were hospitalized with COVID-19 caused by B.1.617.2 had not been vaccinated.

Separate data analysed by Wenseleers showed that infections with the B.1.617.2 variant in northwest England were initially clustered in teenagers, who are not routinely vaccinated. Although the variant subsequently spread to people in their thirties and forties, those in their fifties – who are more likely to have had both vaccine doses – experienced lower rates of infection. "That is reassuring," he says.

Genetic-sequencing data suggest that the rapid spread of B.1.617.2 is less likely to pose a problem to vaccination efforts than is the spread of B.1.617.1. The 452R and 478K mutations identified in B.1.617.2 are both linked to vaccine escape as well as increased transmissibility, says Tang. But B.1.617.1 also carries a different mutation called 484Q, which is more strongly associated with vaccine escape (D. A. Collier *et al. Nature* **593**, 136–141; 2021). This mutation isn't found in B.1.617.2.

**"Saying the vaccine is 'effective' isn't very helpful, because there's a range of effectiveness."**

Reassuringly, no mutation in any of the B.1.617 variant subtypes is associated with increased disease severity, Tang says.

Researchers can also conduct laboratory tests to check how well antibodies neutralize different viral variants. Some of these lab studies indicate that vaccines could be less effective against the B.1.617.1 subtype. Results from similar experiments with B.1.617.2 have not yet been published, but data released by Public Health England on 23 May suggest that the Pfizer–BioNTech and Oxford–AstraZeneca vaccines are effective against B.1.617.2 after two doses (go.nature.com/34rlclo).

Some key uncertainties remain, including how much more transmissible B.1.617.2 is than other variants, such as B.1.1.7. "It's plausible that it could be 50% greater, but it could also be 10% greater, or 60–70% greater," says Christina Pagel, a health-care researcher at University College London. Establishing this will allow scientists to build more accurate models of the effects the variants could have on outbreaks in countries where they are becoming dominant, including the United Kingdom. "It makes a massive difference in terms of what will happen in the summer," says Pagel. "The difference from 20% to 50% is like the difference between a moderate wave and a January-style surge. So that really needs pinning down."

Pagel also questions whether the results on vaccine effectiveness are reassuring. "Saying the vaccine is 'effective' isn't very helpful, because there's a range of effectiveness," she says. Vaccine-efficacy studies tend to focus on the ability to prevent severe disease and death. But it's also important to know whether vaccinated people could catch the B.1.617.2 variant without getting ill, and pass it on, she says. If that is the case, "you don't get the same level of population immunity than you would otherwise".

Peacock says continuing to gather epidemiological data from the UK outbreak will help to answer those questions. It will also help to forecast the potential impact of B.1.617 variants in other countries, particularly developing nations, which do not yet have widespread access to vaccines. "It's important that we provide a service to the world by making those measurements," she says.

# CONTROVERSIAL FOREST STUDY WILL BE LARGEST IN UNITED STATES

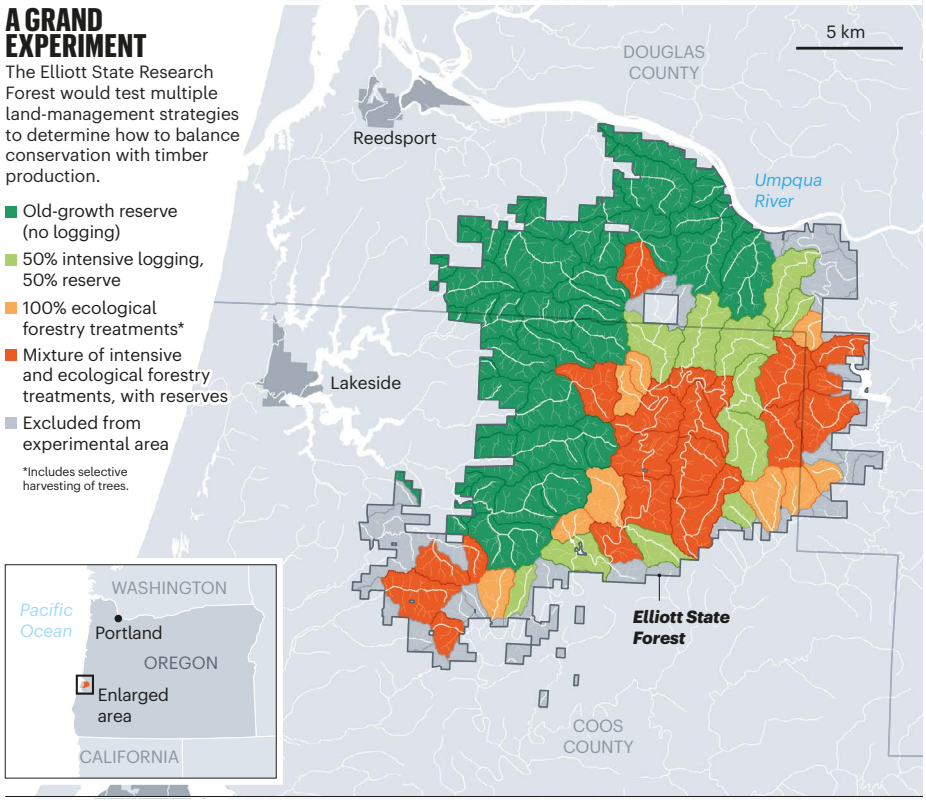
## In an Oregon forest, researchers will explore how best to balance timber production with conservation.

**By Jeff Tollefson**

Despite lingering tensions between environmentalists and loggers, a plan to launch the largest forestry experiment in the United States – and perhaps the world – has cleared a major hurdle. Controversially, the study would allow logging in a new research forest, in an attempt to answer a grand question: in a world where wood remains a necessary resource, but biodiversity is declining, what's the best way to balance timber production with conservation?

"We all love wood, and we all need wood," says Thomas DeLuca, dean of the College of Forestry at Oregon State University (OSU) in Corvallis. "We have to find ways to produce it sustainably, and this project could help us do that."

If the project – proposed by DeLuca and other researchers at OSU – launches successfully, the newly created Elliott State Research Forest in southwestern Oregon would occupy a roughly 33,000-hectare parcel of land. This would be divided into more than 40 sections, in which scientists would test several forest-management strategies, some including extensive logging. The advisory committee for the project, which comprises environmentalists, hunters, loggers and




SOURCE: DEANNE CARLSON, OSU/OREGON GEOSPATIAL ENTERPRISE OFFICE; DESIGN: *NATURE*

members of local Indigenous tribes, approved the latest research proposal on 22 April.

The plan comes as US President Joe Biden and other international leaders are strengthening commitments to conserve land and biodiversity before a meeting of the United Nations Convention on Biological Diversity later this year. In time, the Elliott research forest could help policymakers to determine how best to define and implement those pledges, says DeLuca.

## A contested forest

For decades, the land that makes up the Elliott State Forest has been mired in controversy. Logging is big business in the US Pacific Northwest, and this particular state-owned piece of land contains old-growth forest filled with valuable Douglas firs (*Pseudotsuga menziesii*) and other trees. Other sections have been actively logged and replanted since 1930. It also hosts threatened species such as the marbled murrelet (*Brachyramphus marmoratus*), a seabird that nests in old-growth forests. In 2012, a lawsuit aimed at protecting the marbled murrelet brought commercial logging in the forest to a halt.

The state of Oregon considered various options for the land before OSU researchers stepped forward with a plan in 2018. Their proposal to convert the property into a research forest would allow logging to resume at a lower level — but in the service of science and conservation, the scientists say. According to the plan, the profit from logging in the Elliott forest — around US$5 million to $7 million annually, says DeLuca — would help to pay for the experiment's infrastructure and operations.

There are dozens of research forests around the globe, including in the United States, and scientists have used them to study everything from acid rain to the effects of rising atmospheric carbon dioxide levels. But the Elliott research forest would be larger than most of its predecessors, and advocates say that it would provide scientists with the first opportunity to test ecological forestry at such a large scale.

As currently designed, the project would leave more than 40% of the forest — a section of old growth that has been regenerating naturally since the area last burnt, a century and a half ago — untouched by logging. In the remaining area, researchers would run a series of replicated experiments, carrying out 4 types of land management across 40 small watersheds. On some plots, selective logging of individual trees would take place across the entire area. On others, clear-cutting would take place on half of the land, with the other half reserved for conservation. Other types of experimental plot would mix these two approaches (see 'A grand experiment'). To understand the impacts of each management type, scientists would measure a variety of parameters, including levels of carbon in the forest; stream health; and insect, bird and fish diversity.

**"Let's not make the same mistakes we've made over the past 100 years."**

The scale and approach of the experiment proposed by OSU would represent a sea change in forestry research, says Sue Baker, a forest ecologist at the University of Tasmania in Hobart, Australia, who is setting up a retrospective study looking at similar questions in Tasmanian forests. "I can't think of anything similar anywhere in the world where people have been able to manipulate the forest landscape at this scale," says Baker.

## More hurdles ahead

Since its creation in 1930, the Elliott State Forest has been legally obliged to generate revenue for Oregon's public schools through logging. Before OSU can take it over, the state must compensate the school fund to the tune of $221 million (the value of the forest); it has so far allocated less than half of that amount.

And other hurdles remain. The university must finish a detailed management plan that will lay out rules governing the forest, and it must craft a separate plan for managing threatened and endangered species; this will need to be approved by the US Fish and Wildlife Service.

The OSU team has spent the past few years trying to build a broad — and unlikely — coalition for the effort, through public meetings and engagement with local Indigenous tribes, industry, environmentalists and other members of the project's advisory panel, whose support will be crucial as state leaders weigh their final decision.

But tensions haven't disappeared entirely. Many environmentalists continue to question the logic of clear-cutting forests that absorb and store carbon in the middle of a climate crisis. Rather than perpetuating a long and damaging legacy of clear-cutting, the Elliott forest could be used to pioneer new forestry methods that restore biodiversity and boost carbon storage, says Josh Laughlin, executive director of Cascadia Wildlands, a conservation group based in Eugene, Oregon. "Let's not make the same mistakes we've made over the past 100 years."

Given OSU's long-standing ties to the timber industry, and controversies surrounding its management of existing research forests, it will also need to overcome scepticism about its role as a land steward, says Bob Van Dyk, a policy director at the Wild Salmon Center, an environmental group based in Portland, Oregon. In 2019, for instance, OSU's College of Forestry authorized clear-cutting on 6.5 hectares of one of its forests, felling trees that were hundreds of years old.

DeLuca acknowledges that there have been mistakes in the past, but says the university has a solid academic record, and is committed to building a world-class research facility with the Elliott forest. "If we are able to demonstrate practices that accommodate the broadest array of species while still generating timber for meeting human resource needs, we can have a much larger impact," says DeLuca.