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Hi everyone and welcome to the last lecture in my series of six lectures looking at conservation. So, in the last three lectures of this series, we have looked at the how of conservation. How species focused conservation works, how programs that protect particular species progress and then in the previous lecture we've looked at protected areas which are real cornerstone of conservation efforts globally. Now, a lot of what we've talked about is been focused on biology and ecology. It's been focused on non-human life which is understandable because that's the thing we're trying to protect. We're trying to protect the diversity of life on earth. However whilst humans are the root cause of all the biodiversity declines and extinctions we see today, they are also the things that will prevent further declines. Conservation is inherently a social exercise. It's people that are carrying it out. Therefore, we need to look at the relationship between people and nature, between people and conservation. So why might people be motivated to carry out conservation why might they not.

So it's not just that people pursue activities that damage the natural world for their own interest, a lot of very valuable and very morally justifiable activities and can also clash with conservation. Development that provides people with better income and lifts people out of poverty, even that can clash with conservation interests, therefore, we need to look at methods that can pursue both those objectives. That can be good for the development of society and also good for conservation. So can we look for compromises can we look for win wins and how do we reduce the conflict between people and non humans and nature.

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So, like I said in the last lecture we looked a lot at protected areas, but now we're going to look at conservation outside of these places.

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So protected areas, whilst the global area that we protect using these things, has been increasing hugely throughout the 20th century into the 21st century. They only cover around 15% of the world's land area and only about 5% of the global ocean area, so if we just protect biodiversity in these areas we're going to miss a lot of the world's diversity of life. Global diversity doesn't just exist in these places it exists everywhere, so we also need to focus on conserving things outside of these places.

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This is exemplified by this research that looked at gap species, so a gap species here is defined as a species that no part of its range exists within a protected area, so no part of the species ranges is protected by a formal protected area. And this work showed that there are high concentrations of these gap species in the tropics where there is a higher amount of diversity generally. So in these tropical areas there are quite high numbers of these species that don't occur within protected areas at all if we just focus on protected areas we won't conserve the species at all and they will likely decline and go extinct at some point in the future.

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As well as these gap species we'd also have to think about migratory species. So these are species that as part of their lifespan they migrate from one area to another. So in the UK in the summer we get a lot of bird species that leave in the autumn and spend the winter in Africa, usually but can be other places, to escape cold winters. This can be birds like swifts and swallows they come here in the

summer to breed when there are a lot of insects around for them to eat. And then the winter, when it's very cold and there are many few insects, they leave and they go to a place where they can spend the winter and they can find lots of food. So thinking in conservation terms, these species may be protected in some parts of their range, but not all. So say we set up a protected area in the UK that protects swallows in the summer but then in the winter they spend half the year somewhere else. So if they're not protected in that place somewhere in Africa, then they might continue to decline, even though we're doing a good job of protecting them here. So a particular challenge of conserving migratory species is coordinating conservation efforts between different countries and jurisdictions so again thinking about the migration of birds from the UK to Africa, they often have to cross the Mediterranean Sea. There are some places in southern Europe and especially some islands in the Mediterranean, such as Malta where a big part of their culture is hunting these migratory birds, as they cross the Mediterranean Sea. So then, even if we have a protected area here for the summer and a protected area say in Ghana, for the winter down in Africa, the species may continue to decline, because they're being hunted along the migration route

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So there are lots of things to consider when conserving a migratory species. As part of this, there have been some international agreements, including the Convention on the Conservation of migratory species of wild animals, also known as the Bonn Convention after the city that it was signed in. So there are some agreements that have been made to try and promote the conservation of migratory species. And the Arctic migratory birds initiative is a project that has been set up to try and coordinate the efforts of different countries to conserve birds that migrates in and out of the Arctic regions, every year. There are different fly ways these migratory species take around the world and that's what these different colored arrows show here. And this has been set up to try and encourage different countries to coordinate their efforts, because without coordination these birds may continue to decline.

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So, as well as the consideration of migratory species i'm thinking about conservation outside of protected areas, we want to think about how valuable modified habitats are for conservation. So one of the justifications for protected areas is to try and prevent the ongoing human modification of those habitats within those protected areas. However, when we're looking at conservation outside of protected areas we're not necessarily trying to completely prevent human modification of those habitats. We therefore have to think about how valuable those modified habitats are for conservation. And like a lot of things in conservation, it depends very much on the species that you're looking at and also what you are changing and what you are replacing it with. So if you replace a forest with a cattle ranch you get rid of all the trees you're likely to lose all the forest specialist species, however, you may keep some of the species that aren't for a specialist some of the generalist species. And then, if you cut down a forest and let the secondary for us regrow you may keep a lot of those forest species, so it depends on the species you're looking at and also depends on what takes the place of that primary habitat that you've destroyed. So, as I said, it depends on the taxa that you're looking at.

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So these graphs here, show the percentage of species that are unique to three types of habitats. This is the graph on the left a so the gray bars are primary forest the black circles are secondary forest and the white circles are plantations. So, as you can see, for a lot of species, it is the primary forest

that contains the most amount of unique species So those are species that aren't found in secondary forest and the plantations However, for some species it's not the primary forest that has the highest number of unique species so for moths it is plantations that have the highest proportion of unique species. So it depends on the taxa you are looking at. The graph on the right, shows the percentage of primary for species that you also get in secondary forests and plantations. This shows when you cut down that primary forest how many species, do you lose when you're converting it to a plantation or a secondary force. Lianas are plants that grow in association with trees. Vines and things like that. They grow up tree trunks and then they grow through the canopy so they don't have their own trunks they rely on growing up trees. So you get almost 40% of primary forest species in secondary forest to losing a lot of diversity but you're still keeping some of it. In plantations, you lose all of those species because you are replacing those wild native trees, with different plantation trees. However, at the bottom here with orchid bees you're keeping a lot of the diversity, whether or not you convert a primary source to a secondary or a plantation. So you're keeping almost 100% of your orchid bees when you convert to a secondary for us, which is the black circle and then you're keeping around 70% of those or could be used when you convert it to a plantation. So it depends on the tax of that you're looking at.

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So there's some guidelines have been come up with for how you can make human modified forest landscapes more nature friendly. So generally they should still contain quite a lot of forest, 40% or more. Forest cover should be also considered configured in a particular way so 10% should be a very large patch. And then 30% in evenly dispersed smaller patches so this ties back to the previous lecture when are we thinking about the design of protected areas. The larger patches the more species that contains and also the closer that patches the other patches, the easier it is for species to move between them. And also, when you are thinking about this, the patches should not be embedded in a matrix, which is the human modified landscape in between them, that is completely impossible for animals to move through. That should also be maintained in a state where animals can traverse it, and that also contains some biodiversity.

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So again, thinking about the species that do well in human modified landscape or don't can we think of any characteristics that make species, more or less tolerant to human modified landscapes. So generalists these are species that can survive in lots of different situations, they tend to do quite well in human modified landscapes so especially species that needs quite specific habitat characteristics to survive, whereas generalists can adapt to different situations and different landscapes, they have a wide range of diet and things like that. This includes animals, such as foxes in the UK which can eat a huge range of things and can therefore adapt to different human modified landscapes. They are also animals that tend to be tolerant to disturbance and to pollution which is very common in human modified landscapes, so if a particular species is very sensitive to pollution or disturbance, then it will tend to not do very well in human modified landscapes. So an example of this, for the pollution tolerance are lichens. Lichens are a quite a unique type of organism because they're an association between a fungus and an algae so they're not plant it's two different organisms coming together in a symbiosis and living together. So these lichens they grow on trees and rocks, i'm sure you've seen them around, but these organisms are very sensitive to pollution, so you only really find them in areas where there is low levels of air pollution and the air is very clean. So these are organisms that don't tend to do very well in human dominated landscapes human modified landscapes, because of that pollution.

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So, we've had to think about what type of landscapes and what type of species do well in here and modify landscapes. How do we try and come up with a compromise between human activities and conservation interests. So a lot of the things i've talked about are the impacts of farming, because that is one of the things that is driving land use change around the world lots of land lots of habitat is created and modified to make room for farming. So, are there ways of making farmland more biodiverse or making it better for nature so agro ecology, is the use of ecological principles to reduce environmental impacts, whilst maintaining yield.

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So example of this is shade grown coffee. So coffee a long time ago was grown in quite well developed forests. But the industrialization of the coffee industry meant that it became easier to cut down these trees and have what is known here as sun grown coffee. Coffee bushes are quite small shrubs that aren't shaded by big trees, this may be easier to use machinery and other things to harvest the coffee and it does increase yields, however, these sun grown coffee plantations aren't as good for biodiversity as the previous shade grown coffee, which is coffee that's grown with forest trees. So, as you can see here there are around 61 bird species in this work in Peru in a sun grown coffee plantation. 79 in partial shade, but a much higher 243 in shade grown coffee, which is coffee is grown in well developed forest. So, whilst sun grown coffee may have slightly higher yields the bird grown bird friendly shade grown coffee it's much better for biodiversity, so there is a bit of a trade off here between yield and biodiversity. So you may get slightly lower yields from your shade grown coffee which leads to slightly higher costs. A way of helping more farmers to grow shade grown coffee is to sell that to consumers that are willing to pay a little bit more to know that their coffee was grown in a bird friendly way, in one of the shade grown plantations that are better for biodiversity. And this comes back to the eco labels I mentioned in earlier lecture so you can now buy coffee that has a little label on it that certifies that it was grown in one of these shade grown coffee plantations. It's usually a little bit more expensive, but people that want to know that their products were growing in an environmentally sustainable way in a way that is nature friendly they may be willing to pay a bit more and that encourages farmers to pursue these more sustainable, more nature friendly farming practices.

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Having humans and wildlife in the same landscapes can lead to problems, something that i've talked about in previous lectures human wildlife conflict so this can take many different shapes. But the example i'm looking at here is elephants in the Assam region of India. So some groups of elephants will come out of the forest and they will eat tea crops and they will also go into villages looking for food and because there's such big animals, they can destroy the villages of the communities in these areas. And this obviously leads to conflict between the wildlife and the people. So the elephants are damaging agricultural yields and they're also damaging people's homes that may then lead to the people, killing those elephants, to try and ensure that it doesn't happen in the future. In previous lectures i've talked a bit about how we can try and reduce this and how we can try and encourage coexistence between people and wildlife, so the bee high fences and also the GPS collars can be used to try and prevent this conflict. I've talked about it previously, but I just wanted to mention it here, because when we're thinking about encouraging humans and wildlife to live in the same places which can be inside protected areas, as well as outside them, we need to think about the conflict that can arise.

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So, as well as having environmentally friendly nature friendly farming The other thing to think about is the harvesting of organisms that aren't farmed. So lots of species are harvested for food, medicine, the pet trade and other things. So these are species that aren't farmed instead people go out to find them in the natural world and they take them for food or the things so is doing this lots of this can be environmentally unsustainable, so it leads to the decline of particular species and eventually extinctions. But is it possible to do this in a sustainable way so way that doesn't cause declines of these species. It depends on the species, like a lot of things in conservation and it's often hard to assess.

So there are two ways of tackling an unsustainable trade, the first is to make it illegal to ban it to bring in law enforcement to try and prevent people carrying out that activity, the other one is to set up a legal trade there's regulated ensures the trade continues to be sustainable. So, which of these two options is best again depends on the species and the context we're talking about.

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So one example is reticulated pythons, which is a type of snake that live in Sumatra in Indonesia so they've also been harvested for the leather industry to make and bags and shoes and things like that. So two surveys were done 20 years apart This looked at the numbers, mean body sizes, the clutch sizes and the size at maturity of lots of individuals of this species, so this is a very thorough survey of this species. It was assumed that the harvesting of the species was unsustainable, however, this study found that there wasn't much change over this years, and therefore the harvest appears to be sustainable, which is great news.

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Another example of this is whether or not we should set up illegal trade in rhino horn so as I mentioned several times the illegal trade rhino horn and the poaching rhinos is the main factor causing their declines across Africa and historically across Asia as well. So one of the solutions that has been proposed to tackle this is the setup illegal trade so rhinos can be dehorned, their horns can be cut off. It's made up of the same stuff as your hair and your fingernails so it's a bit like having your fingernails cut it doesn't harm the animal. And it grows back therefore it's possible to dehorn these animals without killing them and then sell those horns in a legal trade. As a very strong debate about whether or not this is a good thing, some people think that it would meet the demand in Vietnam and China and other places, without the need to poach the rhinos. Other people think she would legitimize the use of the rhino horn and the medicine and also allow illegally got horn, horn has been got from poaching rhinos, to enter the market and it would be easier to then sell that poached Horn. So arguments on both sides, and this continues to dominate the debates within rhino conservation.

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So now we've talked a little bit about conservation outside of protected areas we're going to think about whether or not conservation projects that separate humans from nature or conservation that considers humans as part of nature and aims to bring the two together is better. As with a lot of things in conservation it's complicated and there isn't one single right answer. So conservation is not just about animals and plants, as I said at the start of this lecture but about humans as well. And we don't just think about this, because of the impacts that humans have on the natural world we also want to think about the impacts that conservation has on people.

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So one of the considerations here is resource extraction, so this is where we take resources from the natural world. Here we're just looking at resource extraction from protected areas. This obviously happens outside of protected areas as well. Resource extraction can be legal or illegal, so an example of an illegal resource extraction that we've talked about is putting a rhino's for rhino horn. So some of these illegal types of resource extraction, such as bushmeat hunting, which is the hunting of species for their meat, foraging and logging can be done by local communities on quite a small scale. So these can be in developing countries, these can be quite poor people that are just trying to find a way to get an income, and it may be that a protected area has been set up that prevents them from accessing resources they previously had access to. Those things may have been unsustainable, but it may have been one of the only ways those people could make an income could feed themselves and their family so whilst this is illegal, it may be happen on quite a small scale, even though it is damaging for biodiversity.

However, resource extraction, which is damaging the natural world can also be legal so here a review of oil and gas concessions and protected areas in sub Saharan Africa found that concessions overlap part boundaries in 17% of IUCN category 1 and 2 sites. And so, this means that lots of protected areas in sub Saharan Africa have places in them where oil and gas can be extracted. A concession is an area of land that the government has sold to an oil or gas company, so they can extract oil or gas from it. So legally these governments are selling the right for oil and gas companies to extract resources from their protected areas so whilst this is legal it's still very damaging for conservation, they can still cause big problems for conservation, not only in the local area. If you put in also infrastructure to extract oil you're damaging their habitat, you could also have oil spills, but also because it's contributing to climate change. So resource extraction isn't just about poaching and bushmeat hunting illegal things like that we also have to think about these legal but also damaging activities.

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So we have thought, a bit about how you reduce conflict between humans and wildlife and this is another way of doing it here. So you can set up conservation programs that take into consideration the interest of humans and the interests of wildlife, so one of the ways of doing this is a UNESCO, which is a UN organization, biosphere reserve. So these are protected areas that have different zones, they have a core area which where lots of human activities are banned, where resource extraction is banned, but you also have buffer zones which I mentioned briefly previously before where humans can live and where human activities can take place, but certain activities and lots of resource extraction will be banned this then protects that core area. Outside of that you then have a transition area where more activities are permitted where more human habitation can take place where more tourism can happen. And this kind of gradual allowance of different activities as you get further away from the core area protects that core area and trade off between human activities human interest and biodiversity interests. That kind of trade off model has not always been, and still isn't in many places, the model that lots of conservation has followed so whilst we in the modern day lots of people are thinking of ways we can try and meet human interests and by diverse interests this isn't always the case.

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Lots of ideas for modern conservation arose in the USA and the first national park was founded in the USA. Some of the ideals of doing this were founded around wilderness so nature was only really valuable when we excluded people from it. The best way to protect nature was to exclude people from it, so a lot of these national parks were created by removing the native Americans that used to

live in them. So this is Yellowstone, which is the first national park in the world, and Yosemite these were created by the exclusion and extermination of native Americans. This model of conservation has since been moved around the world and is often called fortress conservation so you're setting up a fortress for nature and excluding people from that. And the process by which this was transported around the world was through colonialism.

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Colonialism is defined as the establishment, maintenance, acquisition, and expansion of colonies in one territory by people from another territory. So it was often colonial governments and colonial society that set up these early national parks and these early reserves, so the colonial European settlers in America removed the native Americans to found those national parks. And this has happened all over the world. Lots of colonial powers wanted to carry out conservation, but didn't in a way that was either accidentally or intentionally damaging to the indigenous populations of those places. Now this isn't just a historical phenomenon; neocolonialism means that this continues into the present day, so neocolonialism is a bit different. Rather than directly using military force or political control to suppress and indigenous population, instead you're using processes of capitalism, globalization, and cultural forces. So this means that the model of fortress conservation and the models of Western conservation continue to be used all around the world through the process of neocolonialism. Some of the schemes we've talked about which are used as ways of financing conservation.

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So there are some examples of how people continue to be oppressed and violently excluded from particular areas in the name of conservation. And so, an example of this that's happened, very recently, is the eviction of the Ogiek people from their ancestral lands in the forests of western Kenya. So the Kenyan forest service evicted over 1000 of these people from their ancestral lands and because it interferes with supposedly conservation interests. So the Kenyan forest service is a conservation service employed by the government of Kenya and whilst in many places now working with indigenous peoples is considered to be an effective way of sustainably managing resources in Kenya is often considered that these indigenous peoples are encroaching upon forest interests and their interests clash with those of this conservation service. Regardless of whether or not they are actually managing to sustainably manage these forest resources, so the Kenyan forest service has affected all these people. And the right to manage these forests and are moving towards other people, so this is an example in the modern day of our conservation service using violence to remove the rights of indigenous people, something that's so it's not just a historical phenomenon is continuing in the modern day.

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And so, when we're thinking about whether or not people are part of nature and whether or not they should, conservation should happen by excluding people from nature or whether it should happen by getting people and nature to coexist. We have to think about ideas of wilderness. So conserving wilderness often sees peopleless landscapes, as the ultimate prize. Where any presence or evidence of people devalues that area. This is most prevalent in North America and sub-Saharan Africa, so that model of fortress conservation is most prevalent in those places. A lot of these ideals and how they were moved around the world was based on racist ideals that allowed Western white people to ignore the rights of indigenous people. So, whilst conservation and protection of the natural world is something we might think of as a good thing and something that lots of people

consider to be morally right how we do it is extremely important, and we have to think very carefully about whether or not we would want to do it in a way that not only ignores the right to indigenous people but can also lead to the oppression, violence and murder of those people, which continues today. In my opinion, doing conservation in that way is not worth it, we need to find ways of preserving the natural world that also respect indigenous people, we need to work with them, we need to avoid this type of violence and oppression towards them. It is not the place of Western white people or anyone to go to an area exclude people from it and put the interest of the natural world above the interests of other human beings.

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So again, as we talked about way back in the first lecture. These ideas of wilderness often stem from that romantic period, especially in Europe where getting in touch with nature was a sort of salve or antidote against the ills of industrial society. So here we're coming right back to the start of my lectures where modern day conservation is linked very heavily with how it was founded, so these ideas of wilderness that were formed back in the 19th century are still relevant to the practice of conservation today and arguably have contributed to manviolent and damaging regimes of conservation that have been extremely bad for indigenous people and people around the world. So, not only was wilderness considered as this kind of sublime escape from industrial society, but also as a place for masculine recreation, which is exemplified by the idea of the American frontier, which we also thought about in the first lecture. It was a place for men to go out and prove their manliness so the frontier in America was a mess it wasn't that people in America were moving westward into a place as wilderness. They weren't they were invading an area that had been inhabited by humans for thousands of years and it led to the death of thousands and thousands of native Americans, so these ideas of wilderness what else they can be quite attractive can also be extraordinarily damaging for other human beings.

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So this just covers some of those things I was talking about that the idea of wilderness as the ultimate goal and conservation can be very damaging for people. It also does not take into account the long histories of the influence of indigenous people on their landscapes, so people think about. Certain parts of the world have been untouched by humans as being pristine wildernesses and, but they were often altered and lived in by humans for thousands of years before they were recorded by Europeans. So part of this is an example of this is the Amazon, which was thought to have been largely untouched by humans, but there's lots of evidence that certain places were cultivated by humans for thousands of years, so there are particular soils that are evidence that particular management practices we used to try and encourage trees and other plants that would give the people that live there food and good nutrition, so not only is the idea of wilderness very damaging to people it's also probably wrong and lots of places, because these aren't areas that were completely free from human influence they were just areas that by the time Europeans recorded them.

It may have been a lot of the people that live there had died due to diseases that the Europeans brought with them during the colonial period, therefore, they were considered to be peopleless, but there were probably lots of people living there previously.

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So this ties into how we do conservation, so if we set up an area we fence it off, we conduct fortress conservation, it may be thought that then that's a part of nature, that is separate from humans, but that's not true at all. Humans have created protected areas, not only by fencing them off, but also by the long often long history of human influence that led to that area looking as it does now. If we fenced off a part of the Amazon for a nature reserve, it may be that presumably pre European colonization of that area had been influenced very much by humans, therefore, there are these historical ecological processes allowed those protected area, the ecology found a protected area to appear. Therefore animals landscapes and ecosystem processes do not appear by themselves, they are often got long histories of association with humans, which is something that we have to consider when thinking about conservation because of the potentially very damaging impacts that considering a place as a wilderness can have if we ignore the humans that have lived there previously, then it can be very damaging.

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This is just another example of how conservation has often happened by the exclusion of people. Over 100,000 protected areas where people have restricted access and use. And these cover almost 20% of the earth's land area, so this is a slightly different stats what we had one the other lectures, so there are different ways of defining protected areas, so it might be that this is a slightly different definition to the 15% figure we had earlier on. So this means that a huge area of the earth's land cannot be accessed by particular people. And this is often happened by the exclusion of people often violently as we talked about before. The problem here is that a lot of this exclusion can have led to biodiversity benefits. So this can be good for conservation because you're removing some of those damaging human impacts and that were causing the clients of biodiversity. In my personal view I don't think that these biodiversity benefits are worth the human cost that they come with so I don't think we can justify the protection of biodiversity by the violence exclusion of humans. But there's now moves towards Community based conservation, which is partnering conservation aims with the alleviation of poverty and of improving the livelihoods and the lives of people that live in the areas that we would like to protect for conservation.

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As part of this, there is the field of post colonialism, or the school of thought of post colonialism, which is a critical approach for interrogating the practices and legacies of colonialism and imperialism. This is now very important in conservation and lots of people are critically evaluating the types of conservation we've done in the past and trying to figure out how we can do it better in the future in ways that aren't oppressive violent towards humans.

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So this just sums up a bit about what i've been talking about so our conversation benefits worth having it they are made by excluding oppressing people I would say no. And they're also now moves towards each community manager areas and coupling social goals with conservation goals.

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we're just going to talk about a couple of examples of that now, so one way of doing this is to create indigenous reserved, this is reinstating indigenous rights and ownership overland which can go hand in hand with benefits for conservation. So before colonialism and before industrial society lots of indigenous people managed their land. Now i'm not saying that they had no impact on the land and that they had they had no damaging impacts on it, however, they probably had much lower levels of

impact on the land that they lived on and in many situations, probably made sustainable use of those resources they weren't using them in a way that was going to drive lots of species to extinction. So by reinstating these rights, we can achieve biodiversity conservation, that is effective it's good for conservation, good for a natural world and there's also socially just. We shouldn't assume that just because we give indigenous people rights and ownership of the land, it will necessarily be good for human for conservation. And the idea that indigenous people lived in harmony with nature is what is often called the noble savage. So it wasn't the case that these people had no impact on the natural world. They may have often lived in a way, that was sustainable so that wouldn't have driven species to extinction, but we shouldn't assume that we should work with these indigenous people, to ensure that we can meet both conservation goals and social goals.

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And as part of this lots of these indigenous people have knowledge called traditional ecological knowledge that can be useful for conservation. It's not just about conservation helping indigenous people realize the benefits from their land it's also about indigenous people, contributing to conservation and making conservation and more effective field. And so, this traditional ecological knowledge can provide more complete information about changes over time and space. So it may be an indigenous people have a lot of knowledge about how ecosystems used to be before Europeans colonize that place. And that can then inform future conservation efforts indigenous people can also have skills that Western scientists don't do in this case study. When they were studying lizards in Australia indigenous ranges consistently found more docile individuals that it is hard to see. So without this collaboration, there would have been systematic biases bias towards older individuals that would have altered the outcome of the management suggestions so by working together, we can benefit both conservation and indigenous people.

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Finally, we're just going to get onto some models of how conservation can run in step with the social goals of communities of how communities can manage forest or other areas and realize the benefits of that, while also meeting conservation goals. Rather than an area being owned by a private individual or company or by the state government forest can be owned and managed by local communities, for their own benefit. So there's evidence that forests managing this way can be equally, if not more effective at preventing deforestation than other types of management. And this ties into the intrinsic motivations that we talked about in an earlier lecture where people will be more intrinsically motivated to protect something if they are given the autonomy and the competence to do it themselves. So, by doing this, we are encouraging the intrinsic motivation of these people to protect this area to protect this forest into the future, we shouldn't just assume that by doing this, we are automatically protecting this area the needs of those local people need to be considered. They have their own needs, so we need to provide them with health care with education with the ability to meet those needs, and also to provide them with the knowledge to make effective decisions.

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In doing this, there can be clashes between Western sensibilities, which often dominate conservation and the interests of those communities so lots of Western celebrities are very opposed to lots of hunting activities, especially trophy hunting, which happens in sub Saharan Africa. So this is when. hunting trophy hunting is hunting that takes place primarily for not for food gets to gain a trophy which lots of cases can be the head of an animal or the horns of an animal or something

similar. So this is quite high profile in the UK and also celebrities are against this, however, it can be beneficial for conservation and also for communities that if it's managed correctly can get benefits from allowing people to come in and on certain animals which can be done in a sustainable way. So a couple of years ago, a lot of community leaders and community groups wrote an open letter to some of these celebrities that have been very anti-hunting wanting to try and show why it can be beneficial. Both for development interests and for conservation. Now i'm not saying that you have to like trophy hunting but I should as a Western person be aware of how my sensibilities and my cultural norms may clash with those of other people who are the people that are actually living with and managing these animals. That doesn't necessarily mean that it should stop because at the end of the day, i'm not the person that's living with those elephants i'm not the person that might be having cummings conflict with those animals. So if i'm expecting those people to protect those populations for conservation I also should expect them to be able to do it in a way that is also good for their interests.

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So, finally, the last thing I want to talk about in the context of the relationship between humans and conservation is whether or not it is more effective to ban activities and US law enforcement to prevent people doing it, or whether it is more efficient to try and provide people that would otherwise conduct those illegal activities with alternative livelihoods. So lots of conservation coverage, a lot of news coverage of conservation is focused on the kind of resource extraction that is done by communities that live in the places that we are trying to protect, which often quite poor communities in developing countries. It's worth bearing in mind that a huge proportion of the damaging economic activities that go on that caused by diversity declines are done legally big companies and things like that. Oil companies, farming companies and other things so they're done legally so it's not just these illegal activities are important for conservation it's also trying to get huge multinational companies to act in a more environmentally sustainable way.

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But yeah i'm just going to talk about the relationship between. Enforcement versus the provision of livelihoods so rhino poaching, for example, is often done by relatively poor local people before the horns are sold on to crime syndicates that then smuggle those horns to East Asia or other places for use. And so, an example of enforcement here is getting Rangers to try and prevent the people that are actually doing the poaching. An extreme of this is shoot to kill policies, which means that if someone is seen on a reserve poaching than the goal is to shoot to kill them. They don't try and capture them so they can go to prison. The aim is to kill. There is evidence that they can reduce poaching rates but they're controversial and again it's whether or not we think it's worth these kind of very violent policies are worth the biodiversity benefits we may get from them. This also has other knock on impacts, where a lot of subsaharan protected areas are now very militarized there's now lots of military technologies that go into protecting them and then they can be testing areas for new military technologies, so the feeding into other industries that may be damaging for human society as a whole.

The opposition to enforcing it this way is to provide those relatively poor local people with alternative livelihoods alternative economic activities, so they do not have to poach they don't have to try and get income from poaching rhinos. There is some evidence that doing this is more effective than enforcement so as i've talked about before in Bangladesh, which is one of the papers that will be in the reference list. Raising plants, fisheries livestock and poultry rearing and involving local people in patrolling forests and acting as ecotourism guides may be more efficient than just placing

law enforcement in those areas to stop them deforesting and doing other things like that, so this is just a final example of whether or not we can try and couple social goals with conservation goals. Can we place a alleviation of poverty and the development of human society alongside conservation and it's very difficult and then also compromises that have to be made, but there are definitely ways of doing it.

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And this is just a picture I want to end on. Just how a lot of rhinos in Kenya are protected by lots of these semi military groups of rangers and security groups that use guns to deter poachers and also to if they do catch one, and there will be gunfights and violence and things like that so whether or not we think this is the best way to go. Whether or not there are alternatives to doing this I'm not saying that this is necessarily an awful thing and very bad it's probably the case that African rhinos will be extinct if we hadn't intervened in this kind of way. Especially during the poaching crises of the 1980s and 1970s, and after, so this is likely to have been effective in preventing the extinction of these animals. But are there, better ways of doing things there may always be a place for this kind of protection, but can we try and find other ways that don't require violence that don't require the threat of violence to do so, and in my opinion, it would be great if we could work towards doing that.

END

Okay, so that's the end of my last lecture Thank you very much for listening. I'm just finalizing the final activity to go along with this lecture not entirely sure what it will be yet, but please check in when you can I afford that and I will get it uploaded as soon as we can. And I know I said at the end of every lecture but I'm really looking forward to be able to interact with you guys probably and talk about some of the ideas I brought up during this lecture course thank you very much.