Wildlife Conservation
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Lecture – 39
Revision – II

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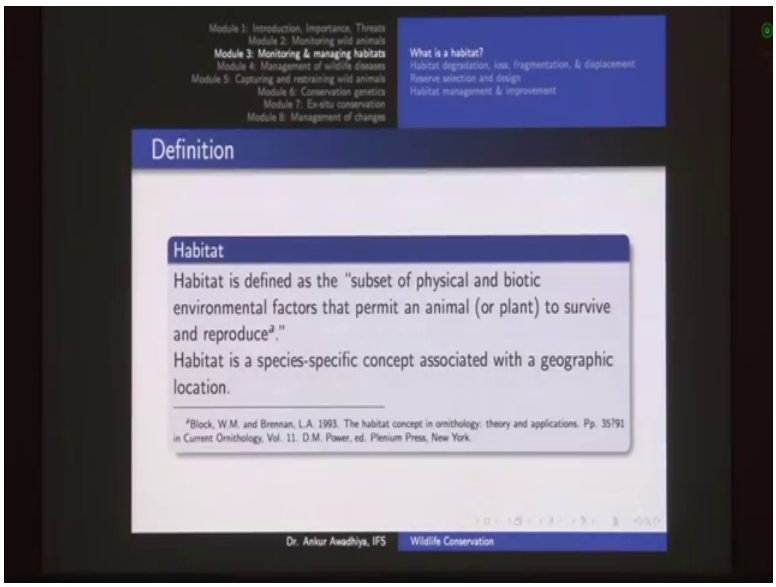

[FL] Let us now move into our second revision lecture. So, in the 3rd module, we started by looking at monitoring and managing habitats. What is the habitat? So, habitat is the subset of physical and biotic environmental factors that permit an animal or a plant to survive and reproduce. It is species-specific and associated with the geographical location.

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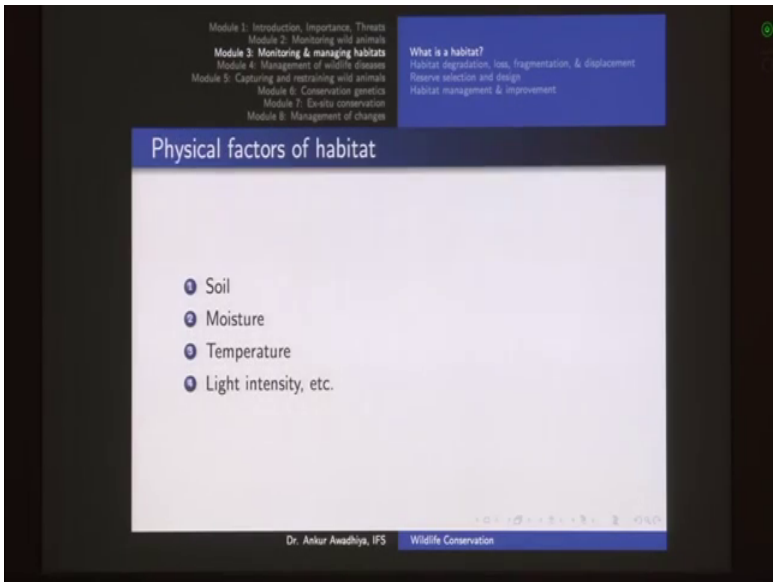

So, we looked at different physical factors of habitats soil, moisture, temperature, light intensity and so on.

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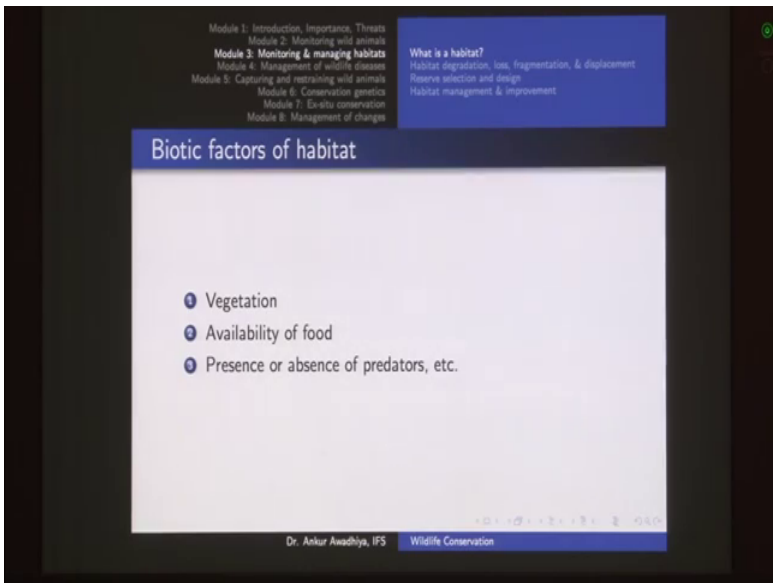

And also biotic factors or the living factors, which is vegetation, availability of food, presence or absence of predators and so on. Then we had a looked at a number of Indian habitats, alpine meadows, forest, then desert eco-systems, wet lands and so on.

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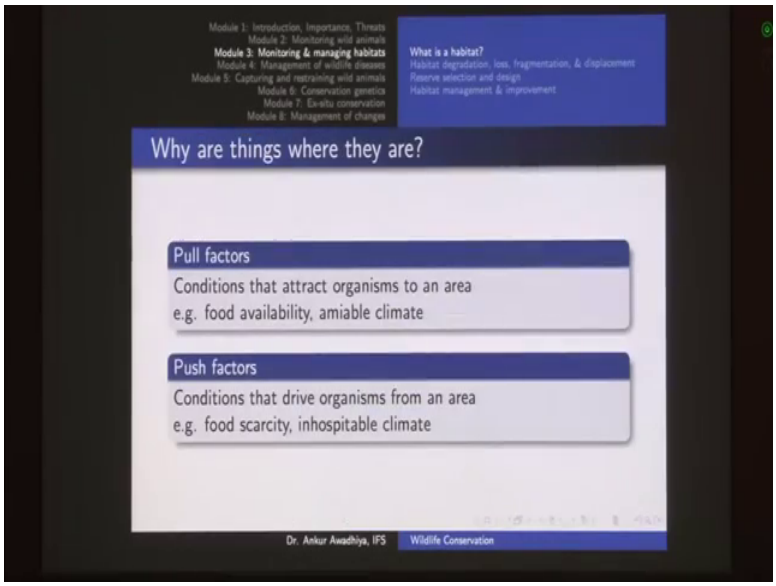

And then we had a look at the pull and push factors. So, pull factors are those factors that attract organisms into an area. So, if something is good in our habitat, then animals will be attracted, so that is the pull factor. If something on the other hand is not good, so animals will be pushed to some other habitat. So, this will be called as a push factor.

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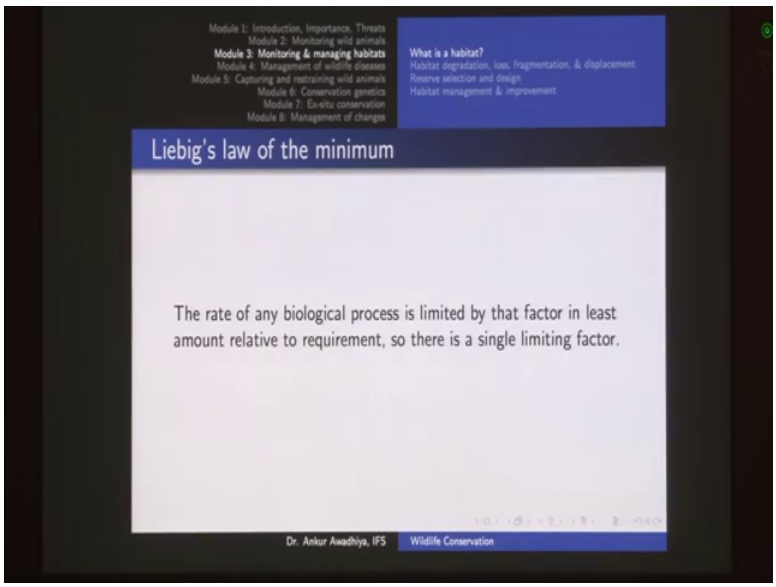

Next we had a look at why things are where they are. So, we had disposal and anthropogenic factors, we had transplantation experiments, how do we interpret these. Then we had two important laws. One is the Liebig's law of the minimum, which says

that the rate of any biological process is limited by that factor in least amount relative to the environments, so that there is a single limiting factor. So, here we also had a look at if we have different nutrients, that nutrients that is available in the least quantity as compared to the requirement would be regulating the rate of growth of the animal.

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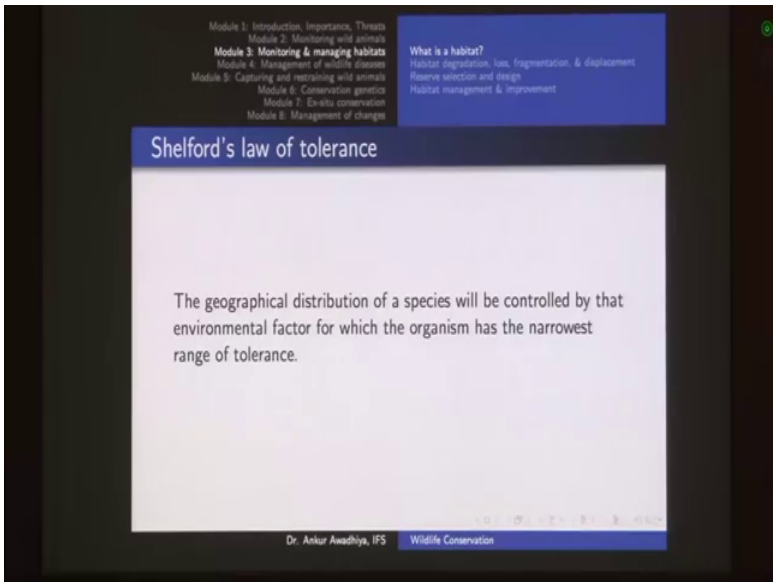

Next we had Sheldford's law of tolerance. The geographical distribution of a species will be controlled by that environmental factor for which the organism has a narrowest range of tolerance. So, for instance if tolerance is less for temperature and more for humidity, so temperature becomes the rule.

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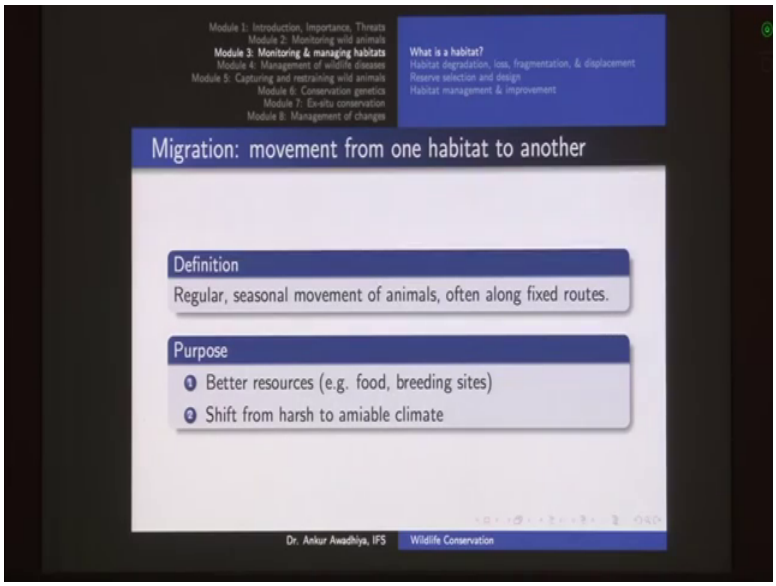

Next we had changes in ranges because of global warming. Then we had a look at migration. So, migration is movement regular, seasonal movements of animals, often along fixed routes. For better resources and for shifting from harsh to an a more amiable climate.

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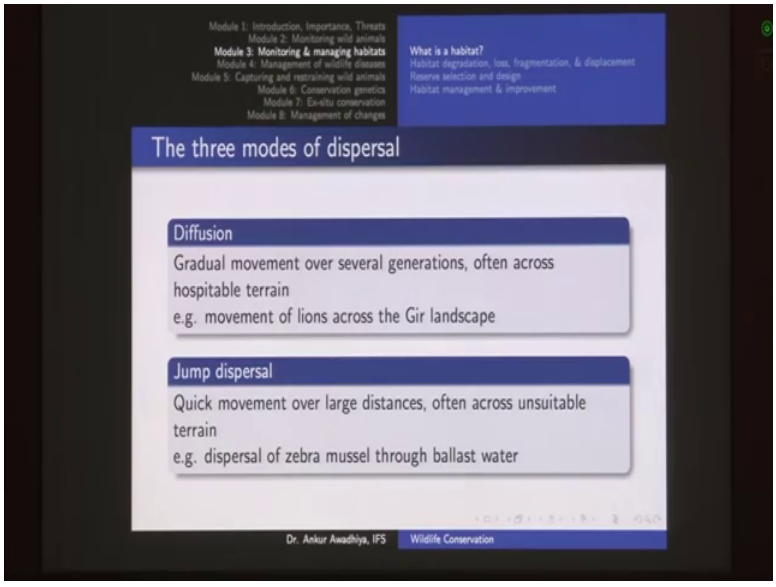

So, we then had a look at different modes of dispersal. So, one is diffusion, so diffusion is gradual movement over several generation, often across hospitable terrain. So, essential in this case, you have a large area that your animal can move through all that

area is something, where the animal can even live. But, then it is gradually moving across that terrain, like the movement of lions across the Gir landscape.

Jump disposal is when your animal is jumping from one point to another point, so everything in between is in hospitable. So, here a good example is movement of animals through ballast water.

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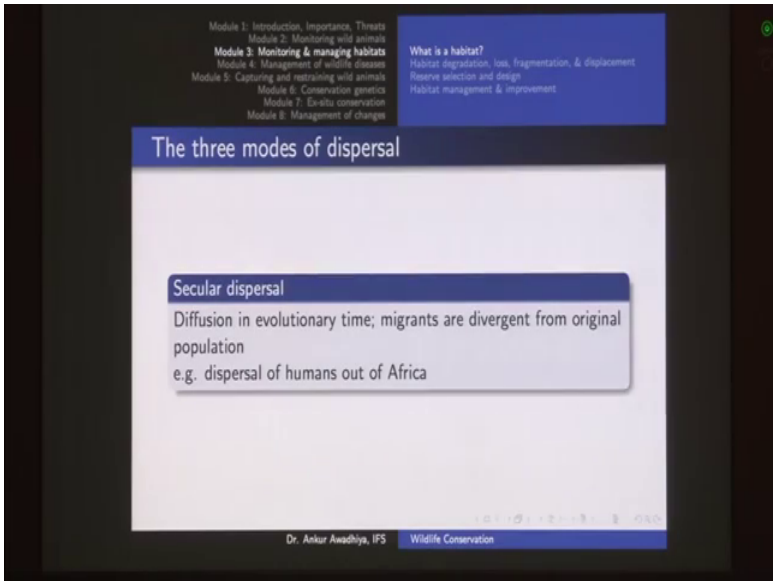

Next we have secular dispersal. So, secular dispersal is diffusion is in an evolutionary time. So, this diffusion occurs in over such a long period that the animals change over the period of dispersal. So, like you have dispersal of humans out of Africa.

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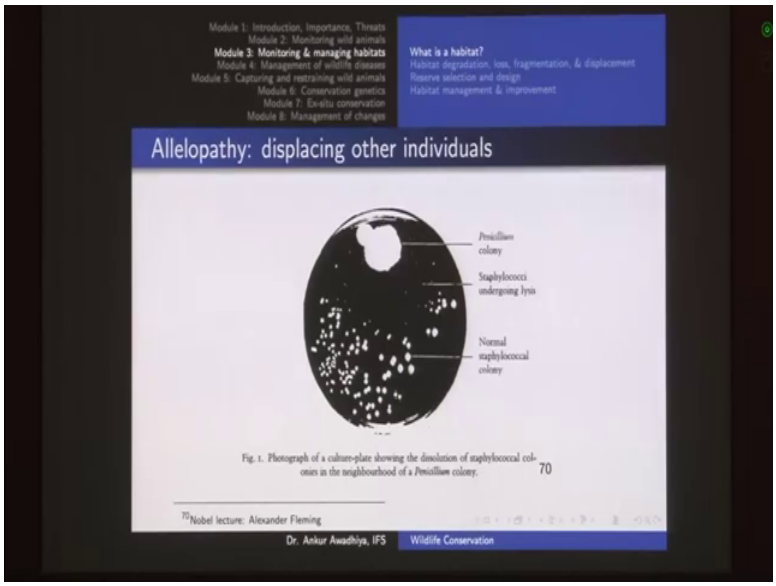

Next we talked about Allelopathy. So, allelopathy is the situation in which one organism gives out something say a chemical that that towards the growth of any other organism.

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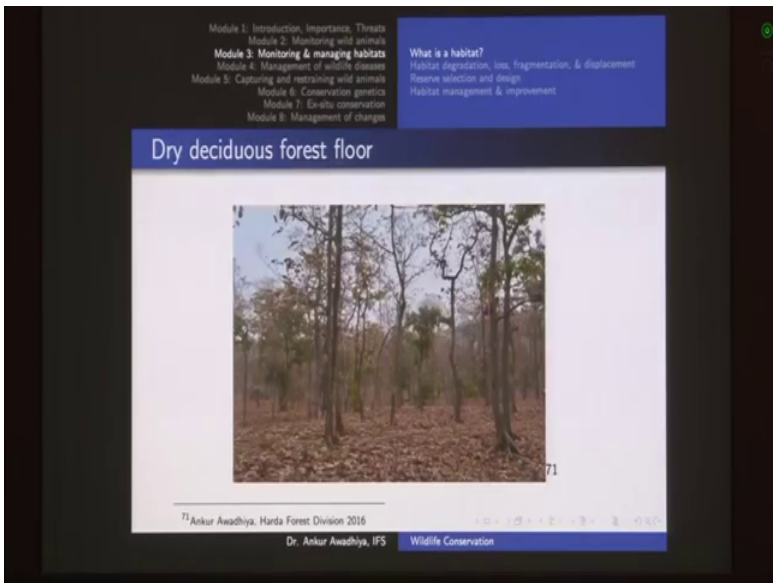

Now, good examples in a forest situations are artic forest or eucalyptus forest, in which we do not find any trees or plants growing below this. So, these are examples of allelopathy.

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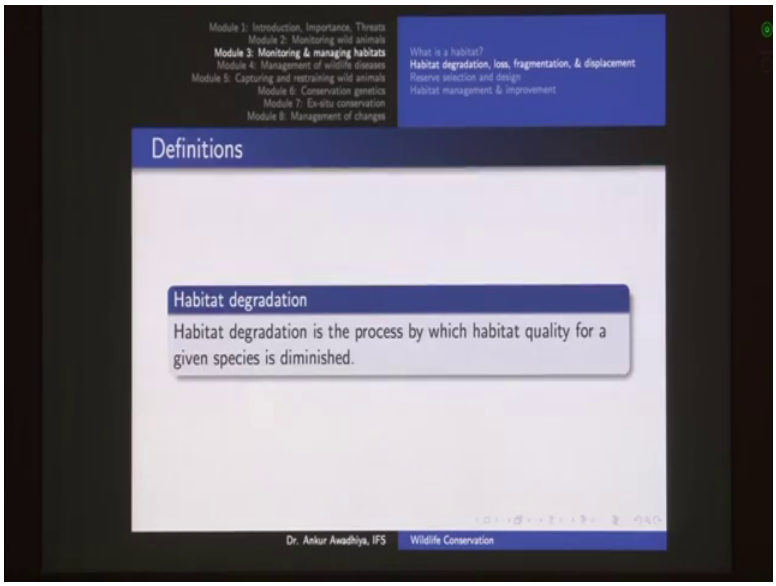

Next we had a look at habitat degradation, loss, fragmentation, and displacement. So, degradation is where the habitat quality is goes down.

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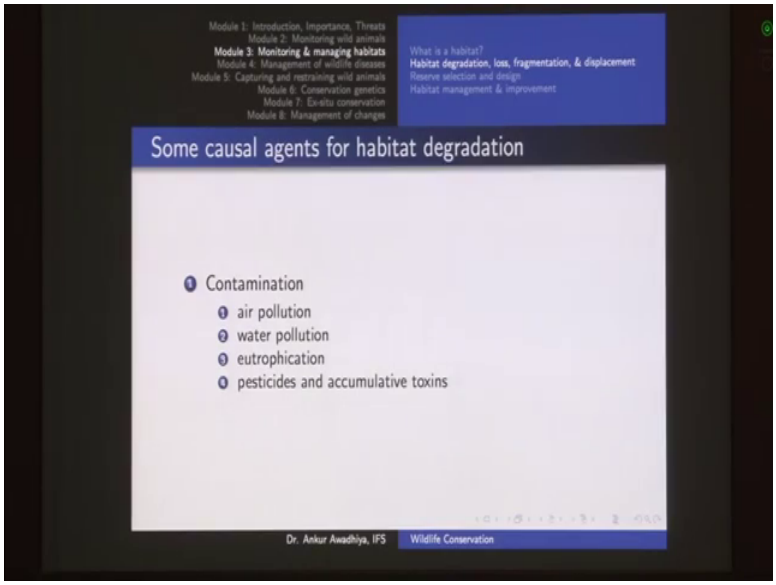

So, degradation can be through contamination or it can be through trash. So, we looked at these trashes, plastics, it could be through soil erosion or fire regimes.

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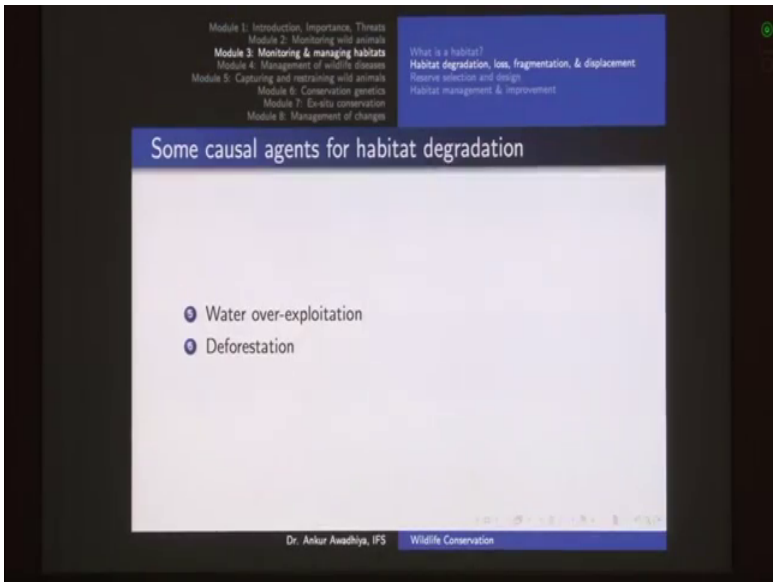

You can have water over-exploitation. So, not enough water remains, you can have deforestation.

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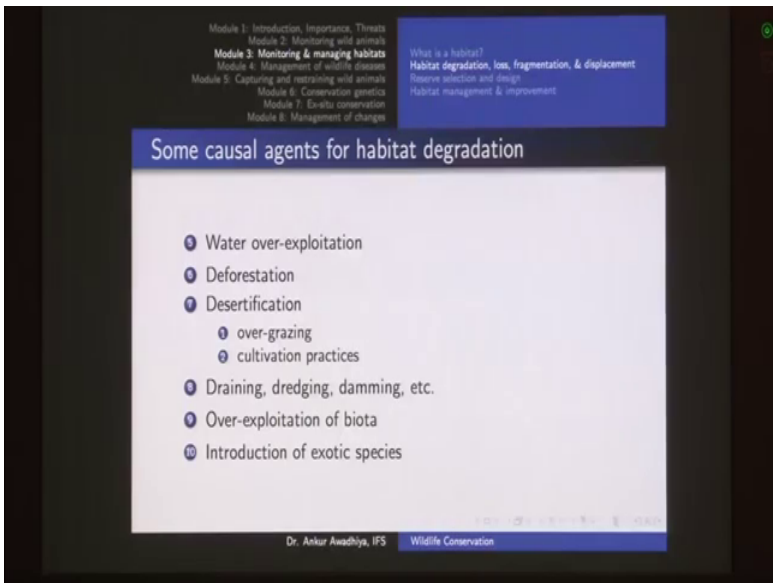

Then you can have desertification. So, areas are converting in to deserts. Then you can have draining, dredging, and damming, over-exploitation of biota, introduction of exotic species; so, all of these cause habitat degradation.

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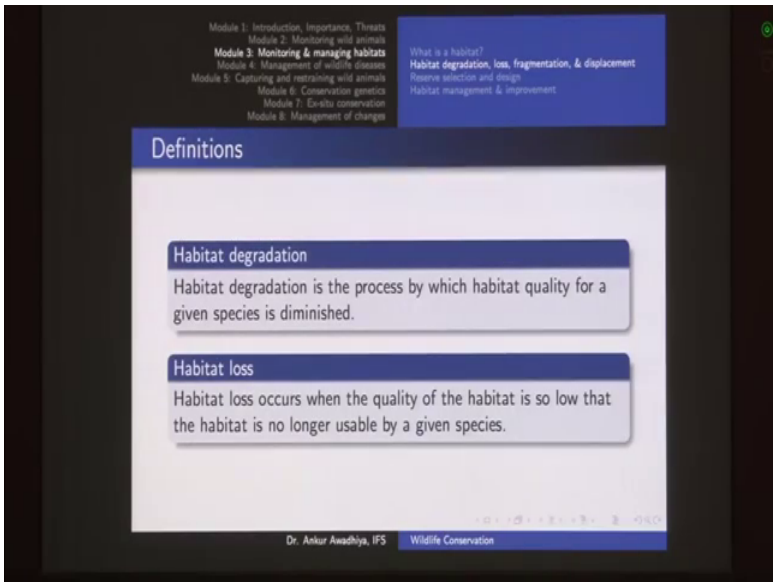

Now, when degradation goes to such an extent that the habitat is no longer usable then we talk about habitat loss.

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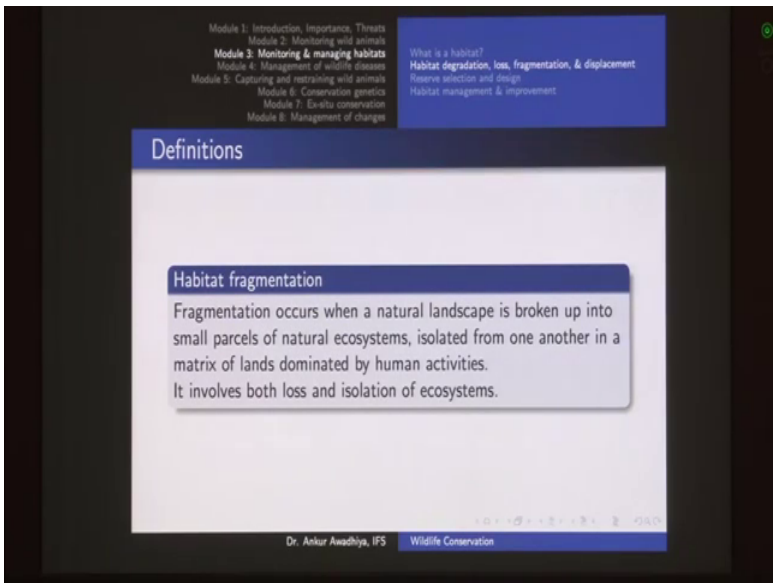

Next was fragmentation. So, fragmentation occurs when a natural landscape is broken up into smaller parcels of natural ecosystem, such a isolated from each other in a matrix of lands nominated by human activities. So, larger fragments are better.

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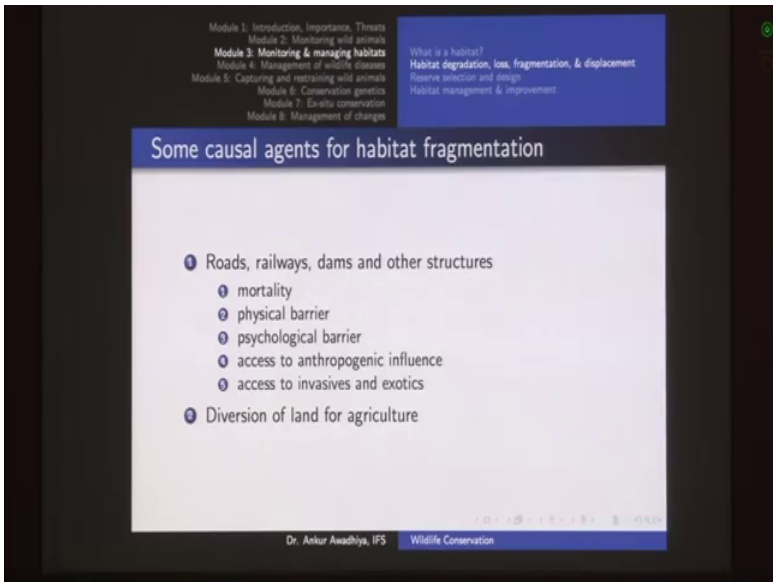

And these are the agents of habitat fragmentation. Linear infrastructure, roads, railways, then we have dams, diversion of lands for agriculture.

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And then we had a look at how fragmentation occurs. So, you have this original forest followed by dissection because of a road, then followed by perforation of some small human habitations, then followed by fragmentation, because these habitations are now growing expanding, and then coming into contact with each other. And then that is

followed by attrition in which it, they grow to such an extent that only small patches of forest remain. Then we had a look at Amazon deforestation.

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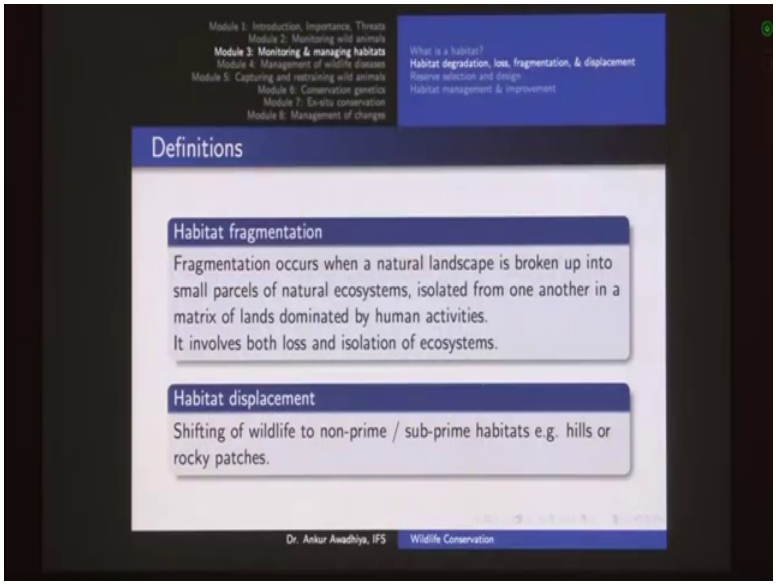

Next we talked about habitat displacements. So, displacement is shifting of wild life to non-prime or sub-prime habitats like hills or rocky patches. So, because all of your grasslands are now occupied, because of agriculture or pastures so, the animals have nowhere else to move. So, they move to non-prime location such as hills and rocky patches, and that is habitat displacement.

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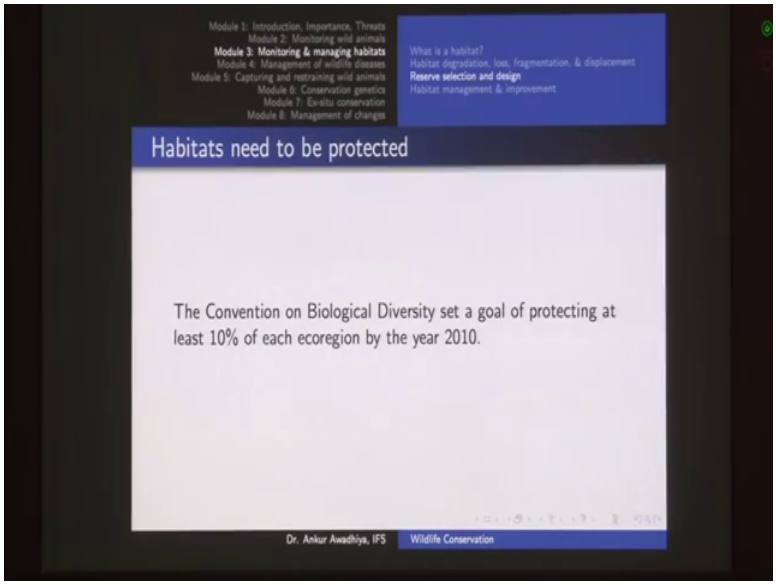

Next we talked about habitat selection and design. So, 10 percent of every eco-region needs to be protected at least.

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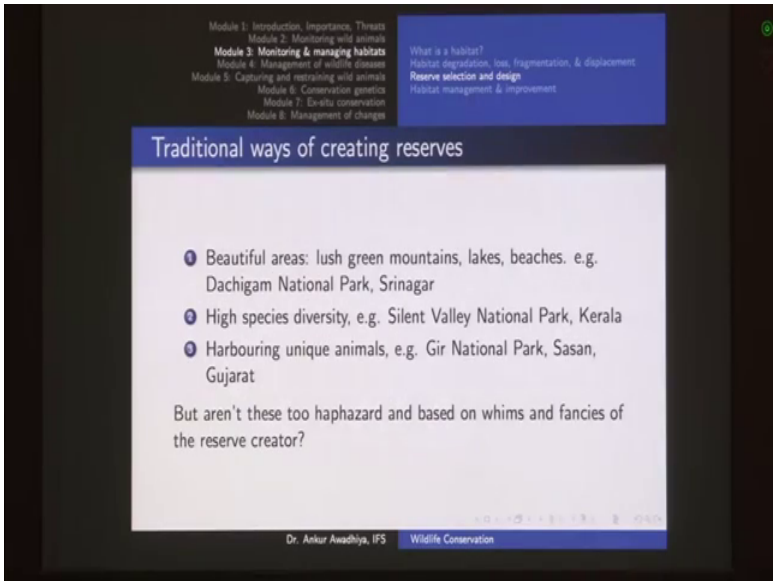

So, earlier we our reserve selection was more haphazard.

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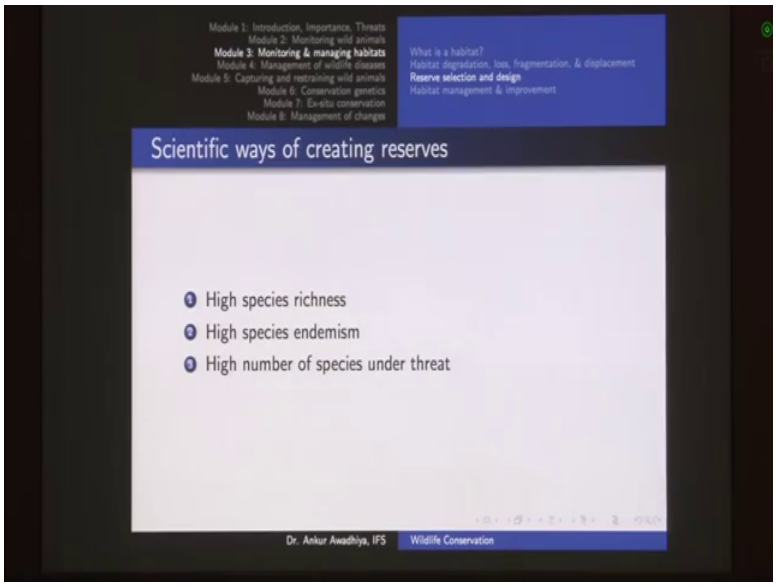

But, these ways we are focusing more on high species richness, endemism, and the level of threat.

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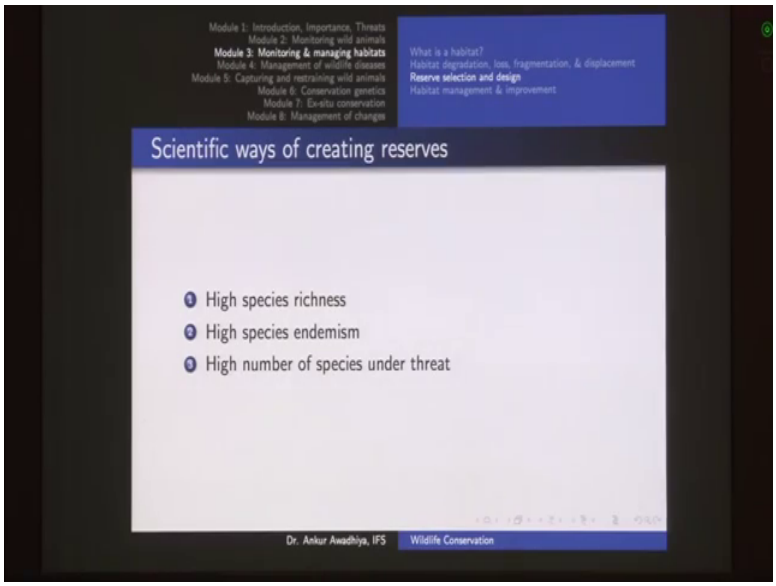

So, we can have these maps, and then we can also go with the definition of biodiversity hotspots. So, these are areas with high richness, high endemism, and high level of threat. So, these are the areas that require preferential protection.

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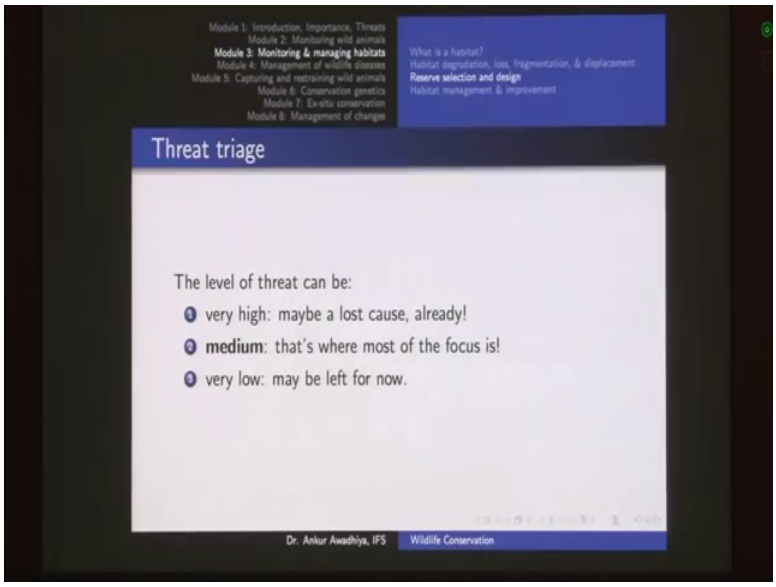

So, then we had a look at threat triage. So, this case we say that the level of threat if it is very high, so by the time we are able to create our reserve, this area would be overtaken, so it will be a lost cause.

If the level of threat is very low, then it is not an emergency situation, we can leave it for right now. And we can focus most of our attention on the medium level of threats, because these are the areas where we can have the maximum bank for the buck or the maximum amount of benefit for per amount of cost, in terms of time or money that is being put in.

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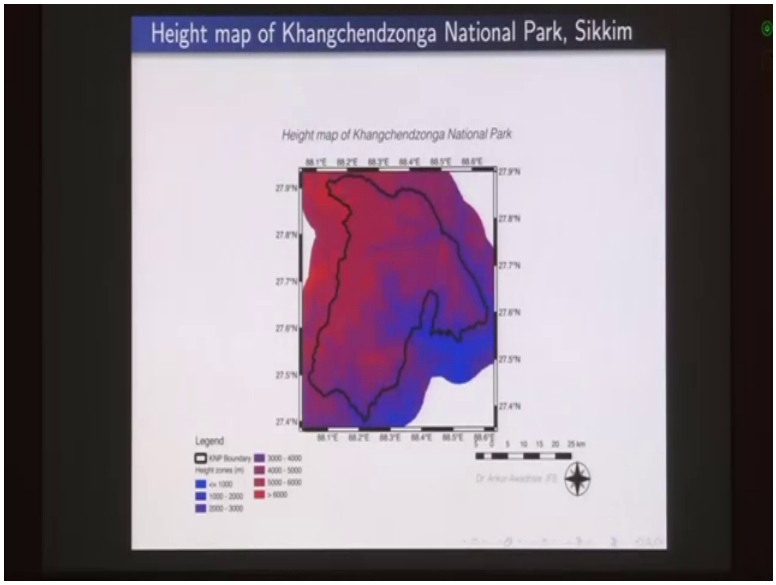

Next we looked at this approach of gap analysis in which those areas that are now missing out from our traditional reserve areas are now preferentially given a selection.

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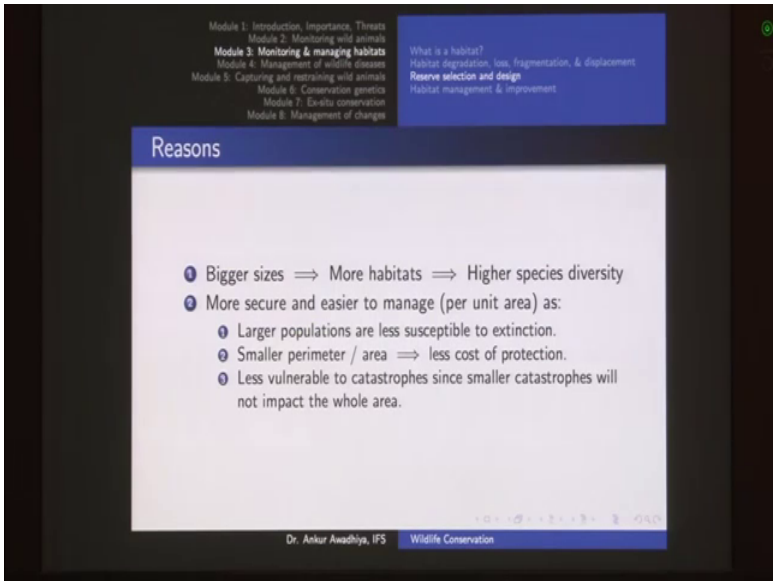

Next we had a look at the principles of reserve design.

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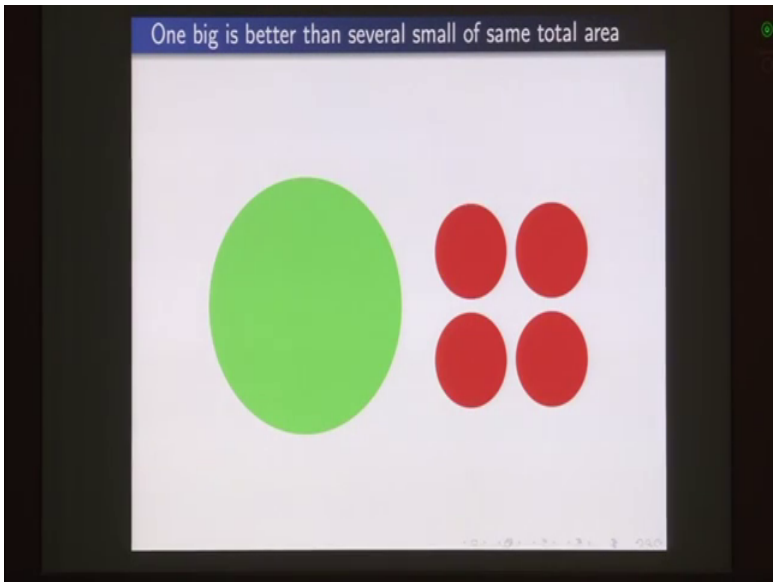

So, big smaller then big is better than small, then one big is better than several small of the same total area. Because, in the case of this big a reserve forest, so you we will have a larger core area as compared to these four smaller ones. So, the smaller ones will have more of edge areas, but less of core area.

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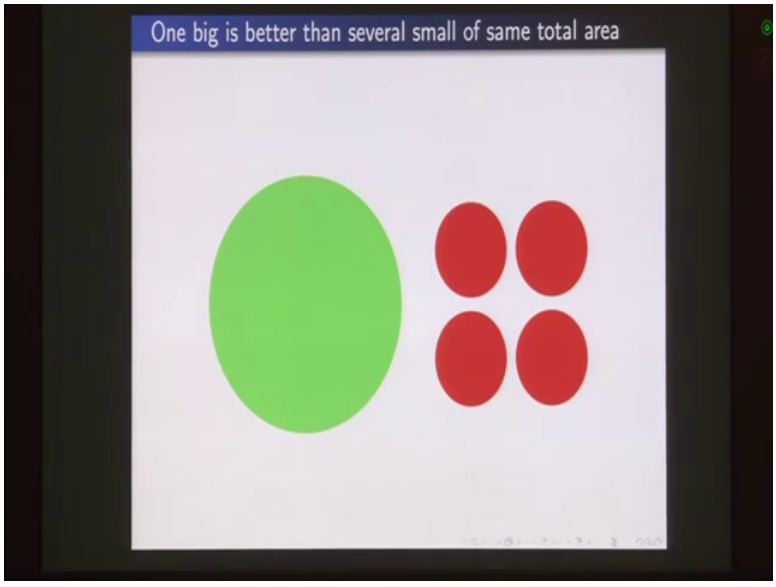

Next you have closer reserves minimize a isolation. Cluster is better, and then circular reserves are better. So, this is one problem that we are observing in some of our reserves. And then if nothing else works, at least have some connection between the reserves.

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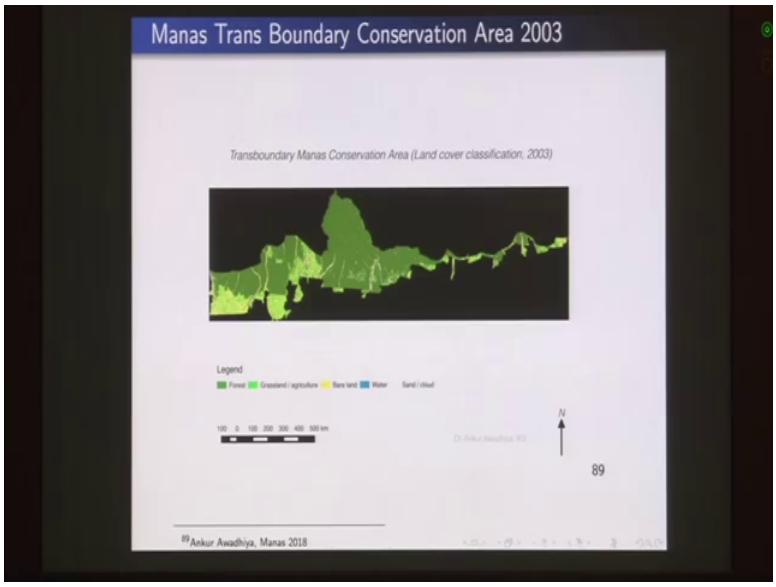

But, even this connection is now going off because of a heavy pressure on our forest.

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Next we talked about habitat management and improvement. So, there are five tools of habitat management as told by Aldo Leopold. So, you have axe, you have cattle; cattle or

cow, you have the plough, you have the gun, and you have the fire. So, these are five tools of habitat management.

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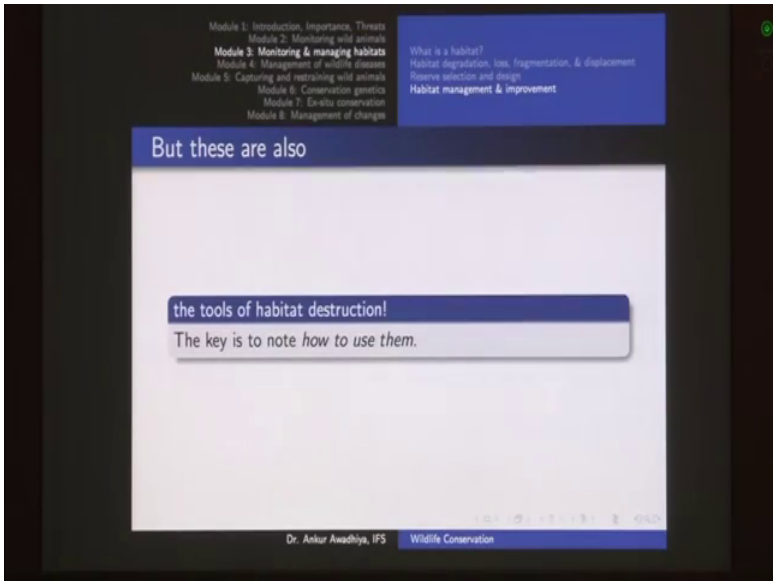

But, then these are also tools of habitat destruction. So, you need to know how to use them properly.

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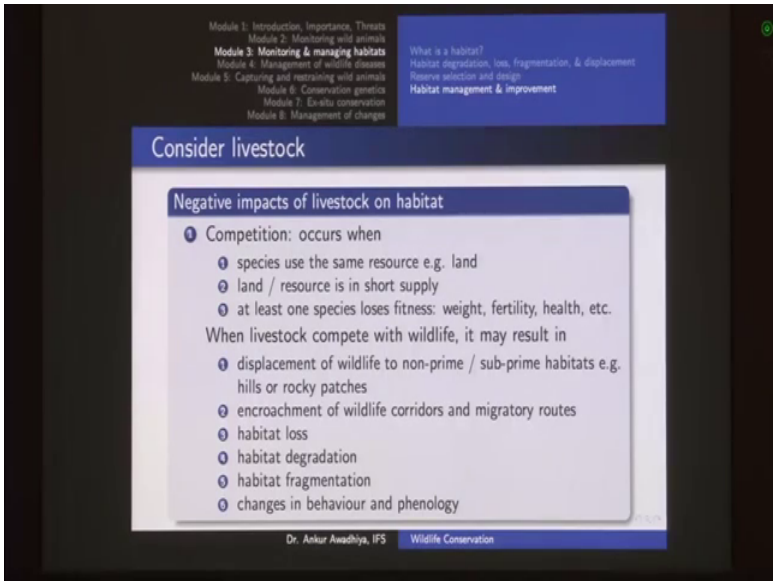

So, for instance, in the case of livestock, we looked at a number of negative impacts of the livestock on habitat.

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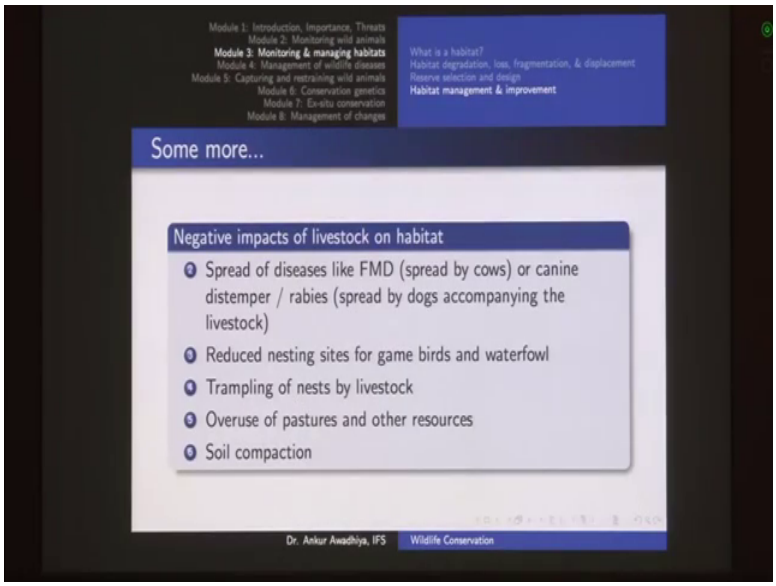

Like competitions, spread of diseases, reduced nesting site, trampling over use of pastures, soil compaction.

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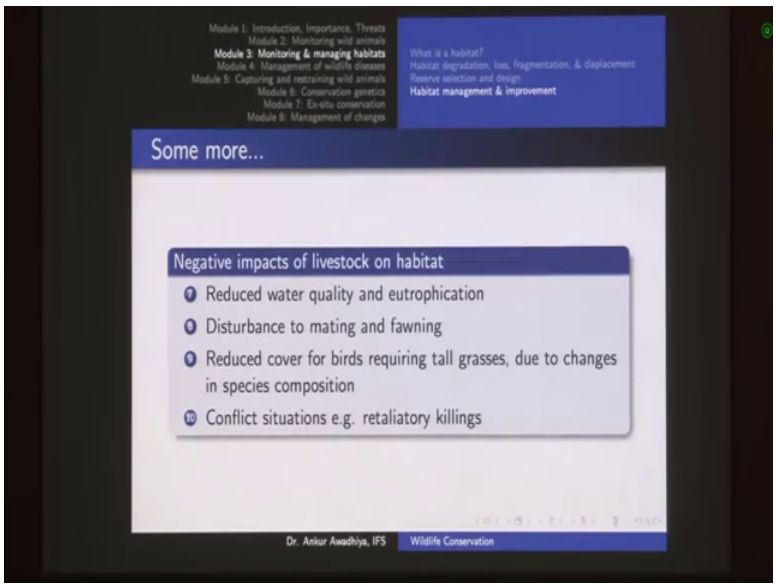

Reduced water quality, disturbance to mating and fawning, reduce cover for birds, and conflict situations.

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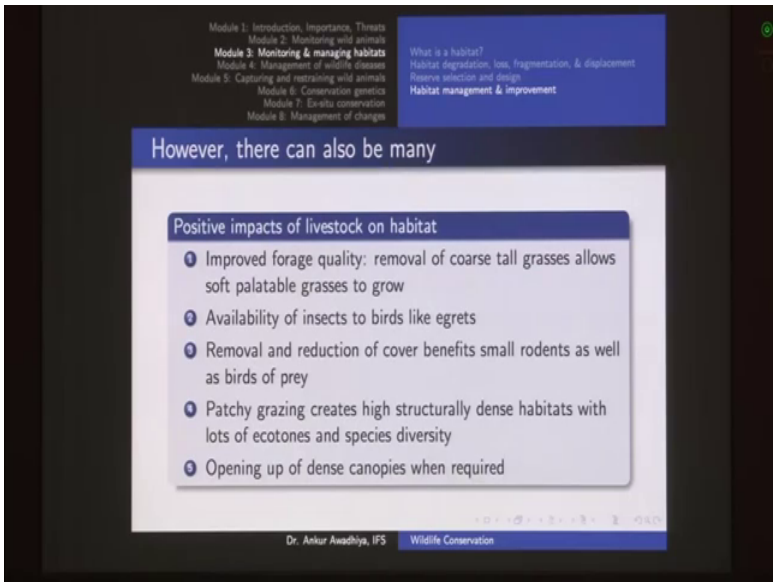

But, then they can also have a positive impact, if they are used properly. So, you can have an improved forage quality, availability of insects for birds, removal and reduction of cover benefits this the small rodents as well as birds of prey, patchy grazing to have more structural dense habitats, opening up of dense canopies.

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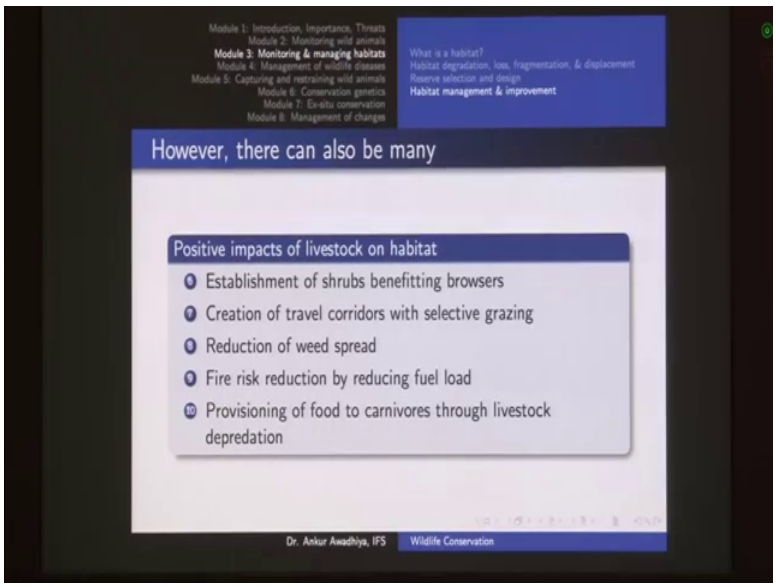

Establishments of shrubs, creation of travel corridors, reduction of weed spread fire risk reduction, and provisioning of food to carnivores.

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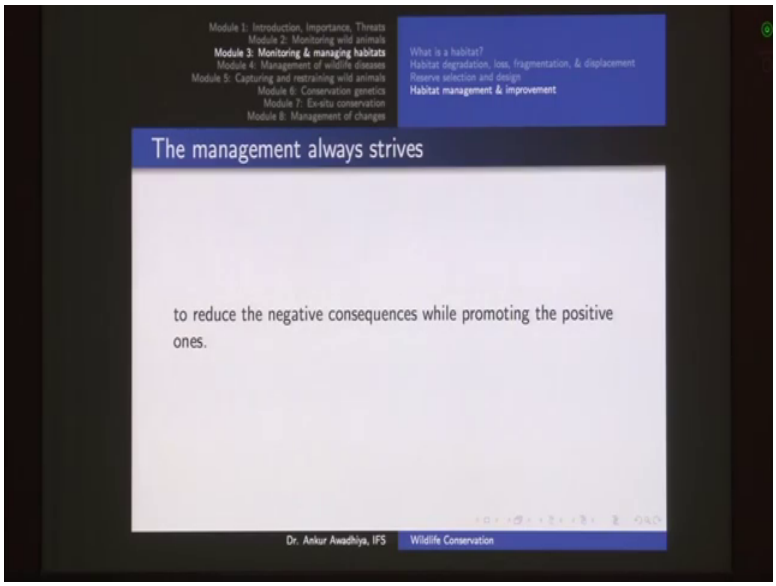

Whether you have the positive benefits or whether you have all these negative losses depends on how you are managing the situations. So, the management is always striving to reduce the negative consequences while promoting the positive ones.

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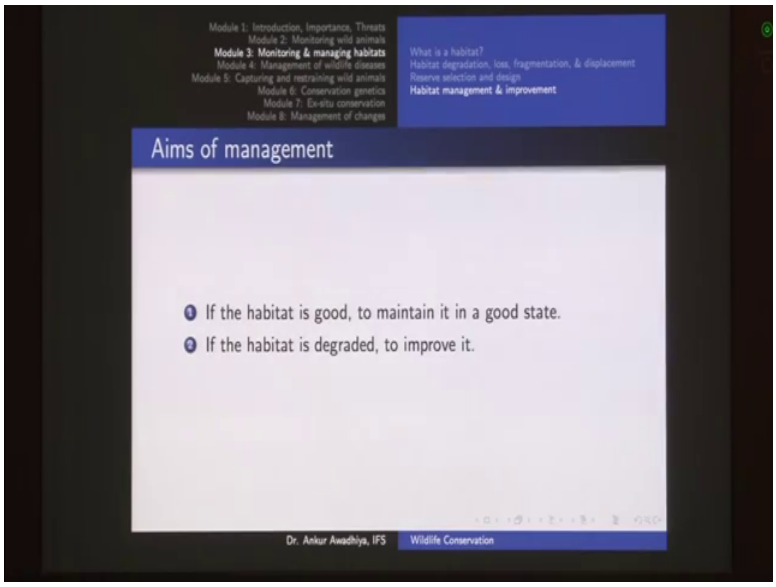

So, if there is good habitat maintain it, if it is degraded, then improve it.

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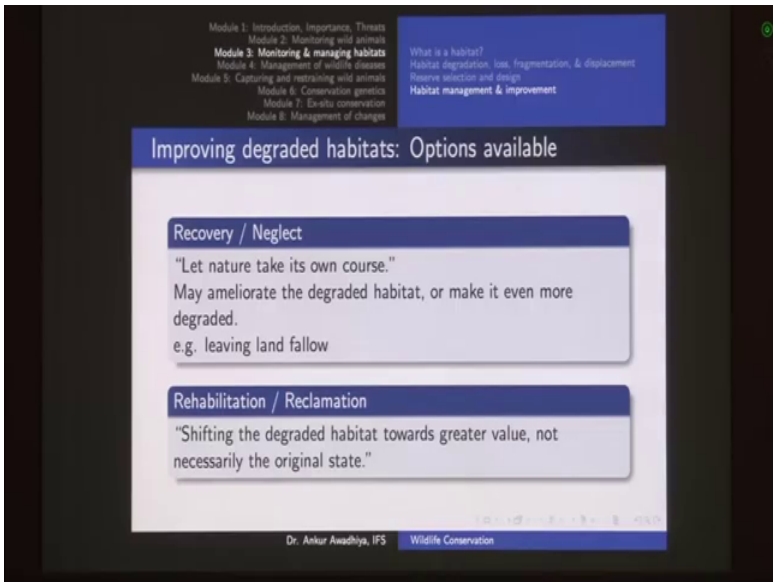

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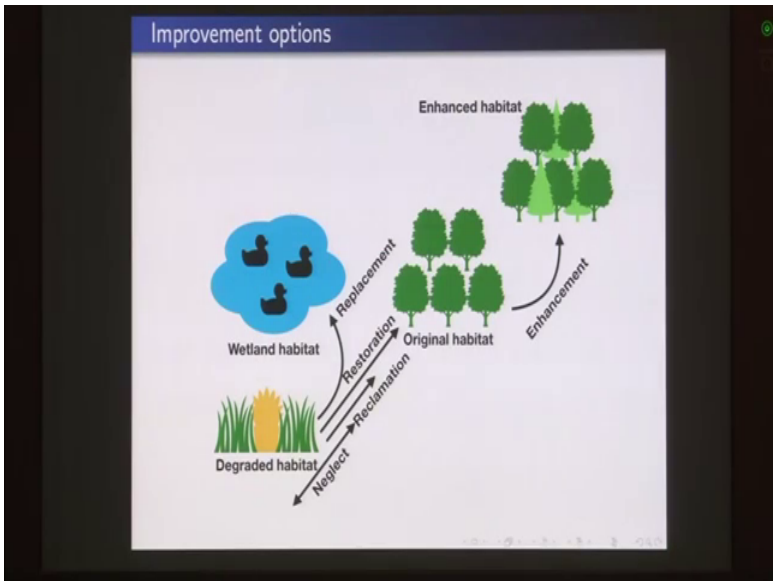

Then we looked at different improvement options. So, if you have degraded habitat, you can just leave it as such, which will be known as a neglect. Now, neglect may further degrade it or there may be some amount of improvement in the habitat by nature itself. But, then if the amount of degradation is large, then next you could go for a reclamation. So, in the case of reclamation, you are moving towards the original habitat. If you are able to completely reclaimed, then it will be known as restoration. And then if you go beyond the restoration, it will be called as enhancement.

Now, in certain situations when all these are not possible, we can even go for a replacement. So, in the case of a replacement, you do not you have moved away from the degraded habitat, but not towards the original habitat, but towards a very new habitat such as a wet land. So, this goes by the name of replacement.

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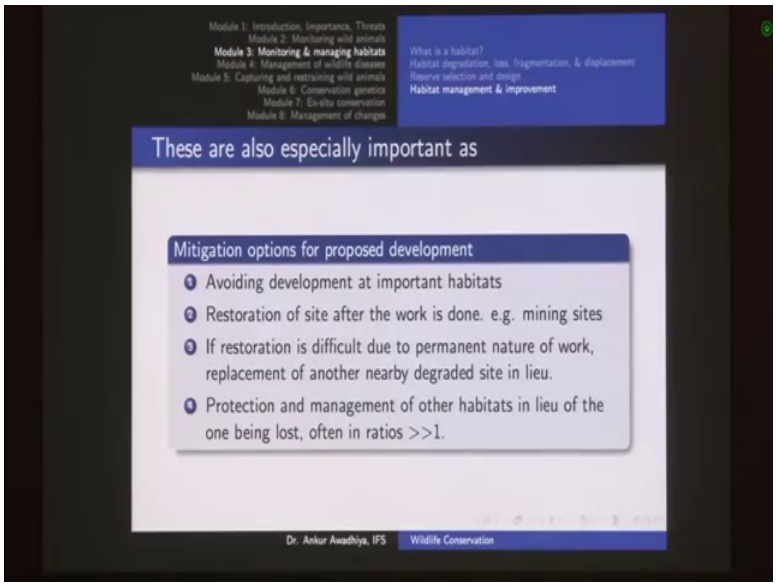

Now, we also looked at different mitigation options. And then what are doing for habitat management. So, control of fires if we are using more and more technologies, then control of invasive species, provisioning of water holes and salt licks, involvement of locals and stakeholders, habitat monitoring plantation, drives trash collection and so on. So, all these are being done for habitat management.

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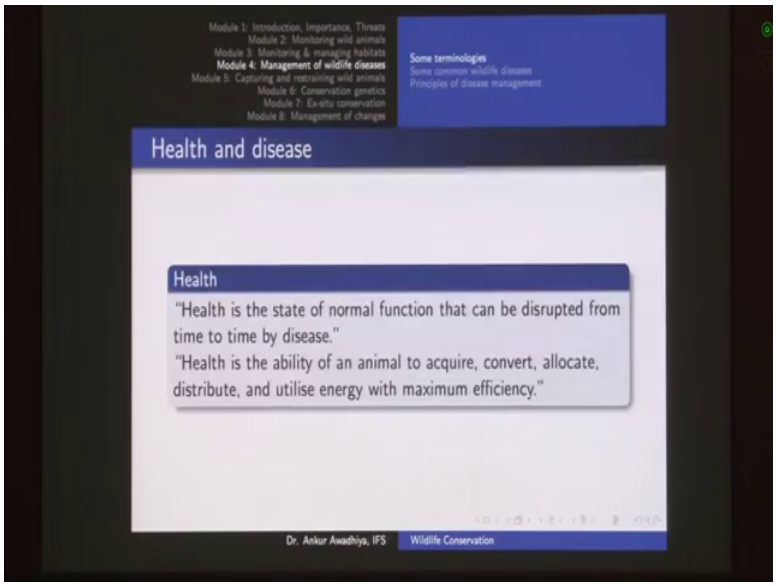

The 4th module was on management of wild life diseases. So, we began with some terminologies, what is health, what is a disease.

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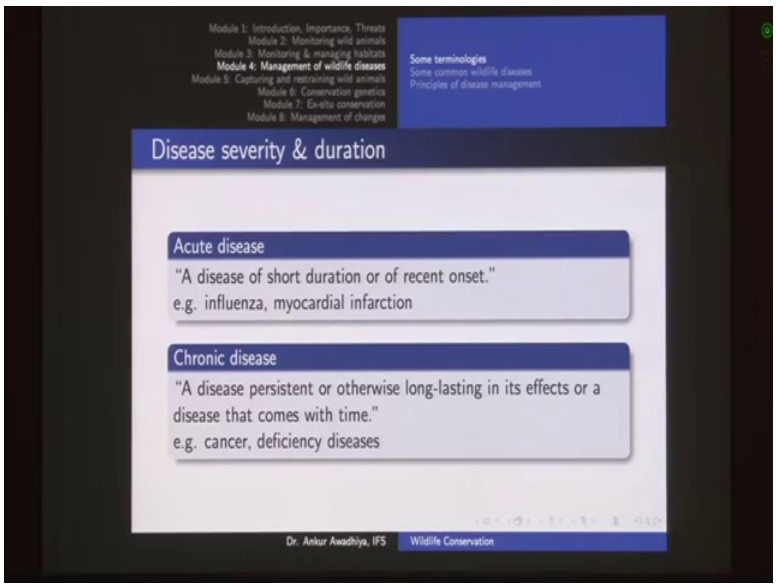

Then in the case of acute and chronic diseases; the one thing that you need to keep in mind is that acute is fast acting, chronic is slow acting. So, in the case of acute diseases there will be short duration, recent onset, it occurs very fast. In the case of chronic diseases, they take a very long period of time. So, they have been therefore a very long time like cancer and deficiency diseases.

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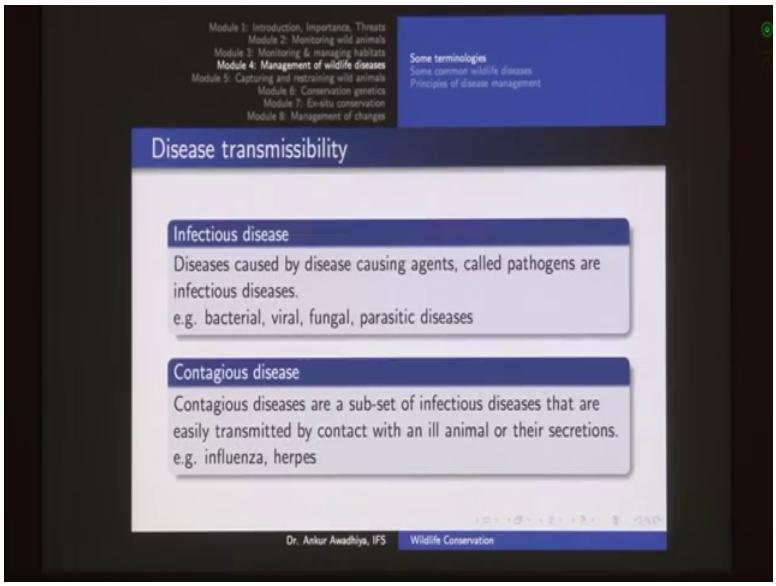

Then we differentiate it between infectious diseases and contagious diseases. So, contagious diseases are those infectious diseases that can spread just by touch.

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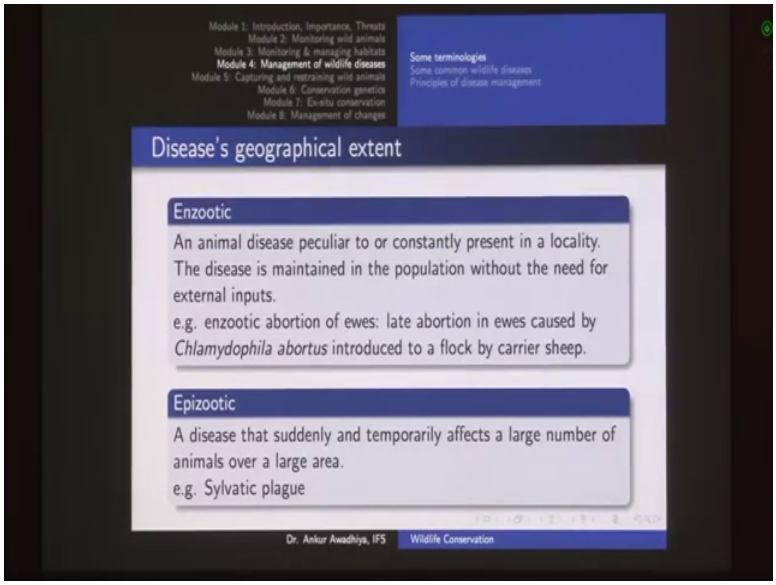

Now, we talked about enzootic. When disease is localized epizootic, when it is effecting large number of animals over a large area.

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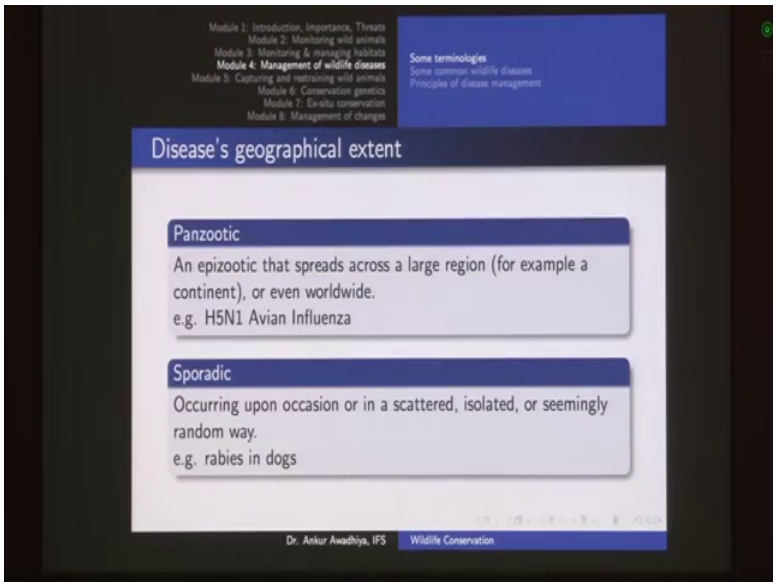

Then panzootic, when it is effecting the whole of the world or a at least a continent, then sporadic, when it is happening randomly in a haphazard manner.

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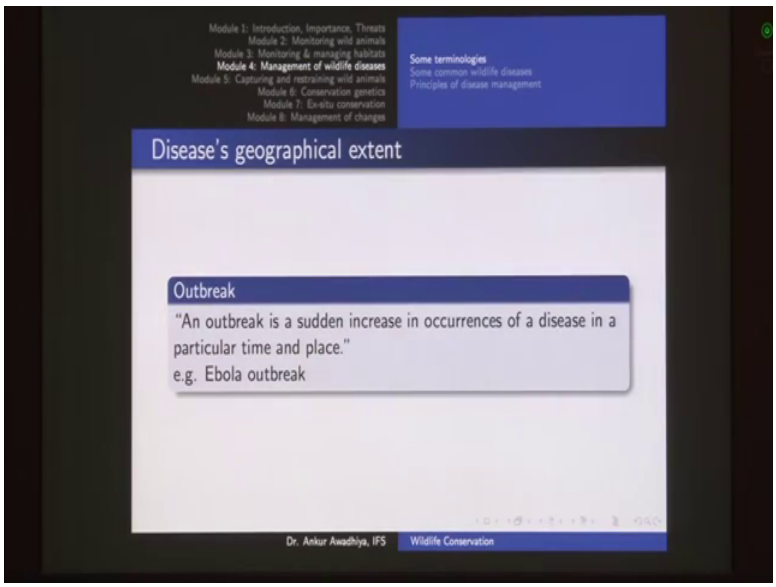

And also an outbreak, when there is a sudden increase in the occurrence, like an Ebola outbreak.

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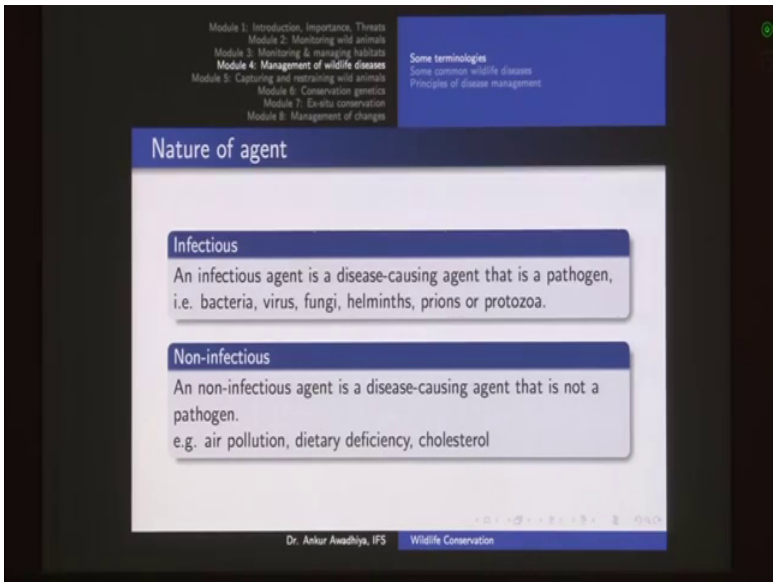

Next, we differentiate it between infectious agents and non-infectious agents. So, infectious agents are pathogens like bacteria, virus, fungi, protozoa or parasites or prions. And non-infectious agents are like air pollution, dietary deficiency, and cholesterol.

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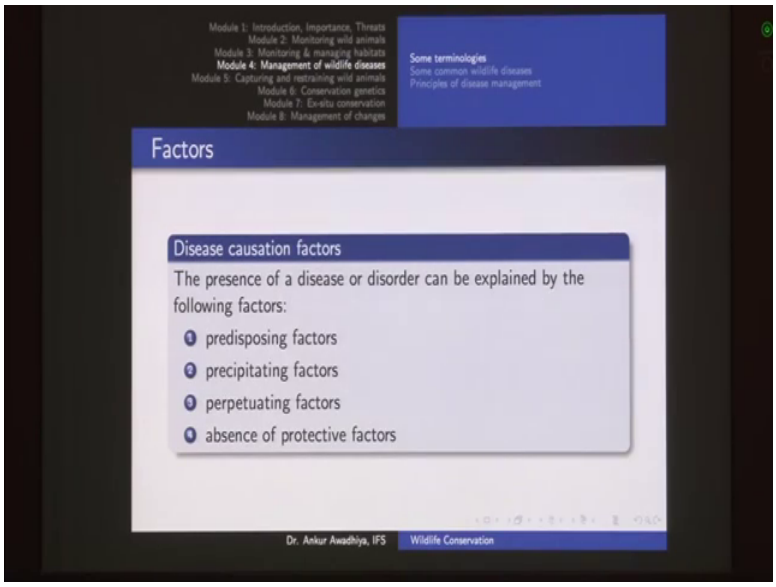

Then we talked about predisposing factors, precipitating factors, perpetuating factors, and the absence of protective factors. So, predisposing factor, if a person is say having a is very young or an animal is very young or very old.

Precipitating, if it gets exposed to the pathogen; when perpetuating factors, if it is kept in a surrounding where all the other animals are already diseased, it is not getting enough amount of nutrition. So, this disease will perpetuate. And then absence of protective factors, so if the immune system is not working properly, then there is an absence of the protective factors.

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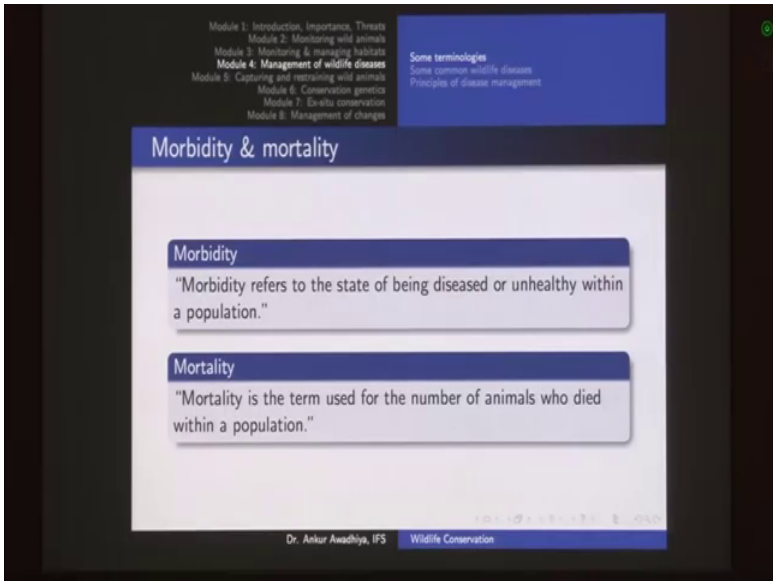

Next, we differentiate it between morbidity and mortality. So, morbidity is getting sick mortality is a dying off.

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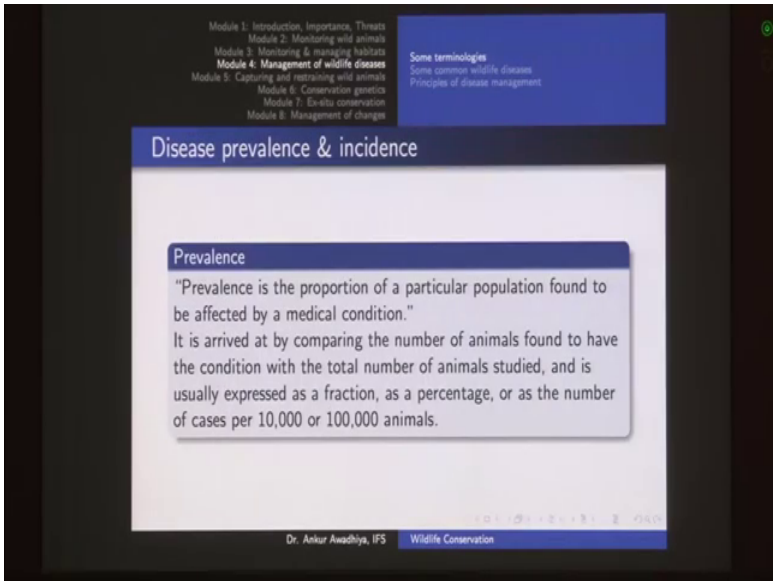

Next, we differentiated between prevalence and incidence

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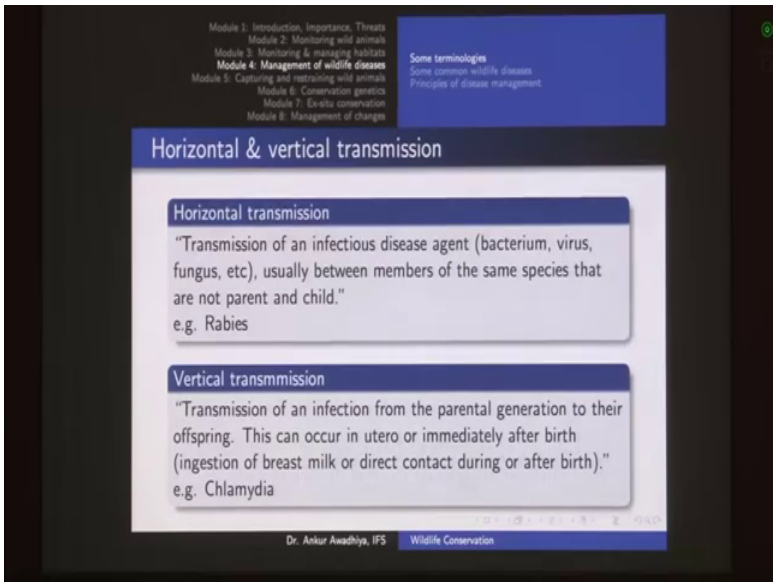

And also horizontal and vertical transmission; so, horizontal transmission is between (Refer Time: 12:16) member to another member that is not parent or child. Vertical transmission is that is occurring between parents and child.

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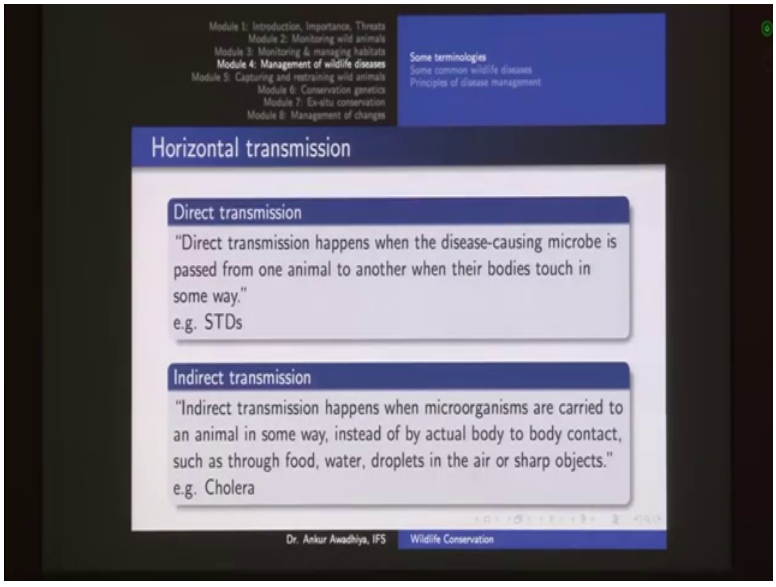

Then we talked about direct transmission and indirect transmission. So, direct transmission is when the bodies are touching in some way. Indirect transmission is when

the bodies are not touching, but this is going through food, water, droplets, in the air or sharp objects.

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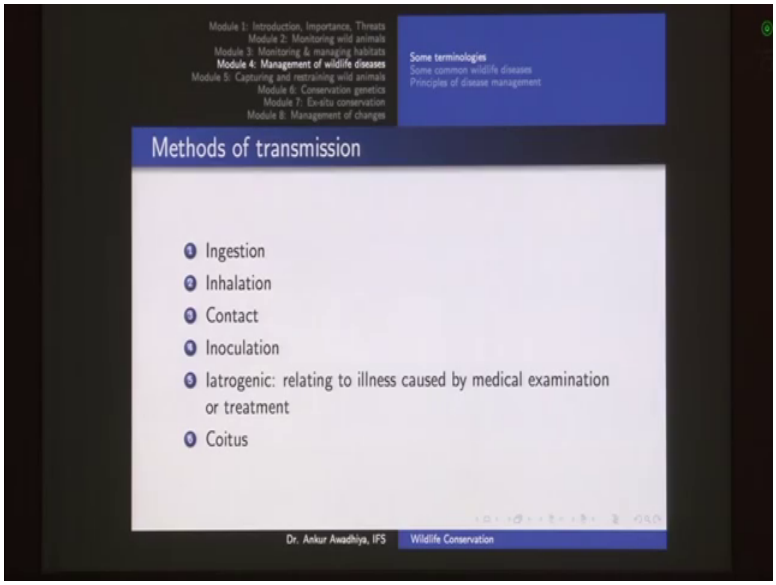

Then the methods of transmission are ingestion, inhalation, contact, inoculation, iatrogenic that is related to medical treatment or coitus, which is mating.

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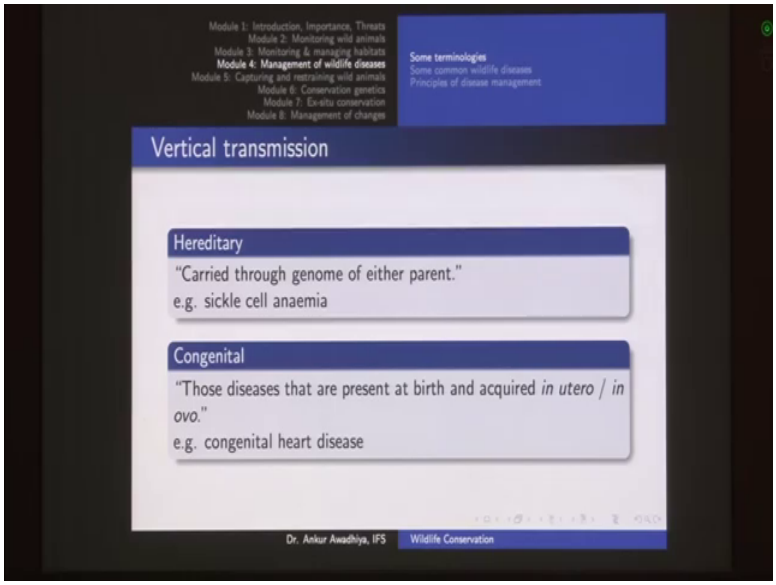

Next we talked about vertical transmission. So, there can be hereditary diseases, there can be congenital diseases.

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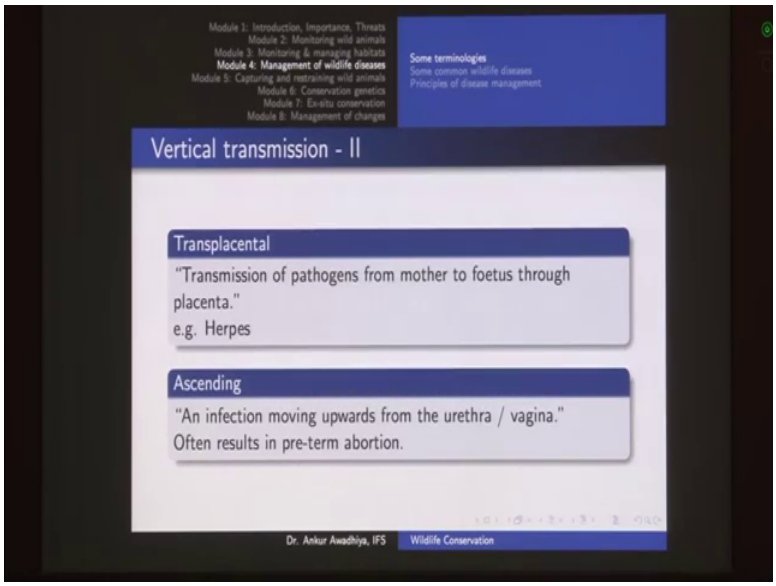

There can be transplacental diseases, and ascending diseases.

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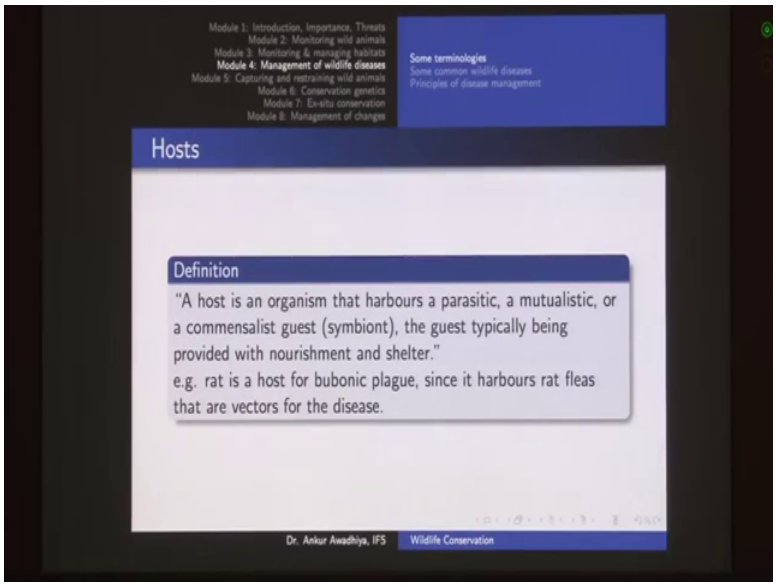

Then we looked at host. So, host is an organism that harbors a parasitic, a mutualistic or a commensalist guest or a symbiont, the guest typically being provided with nourishment and shelter.

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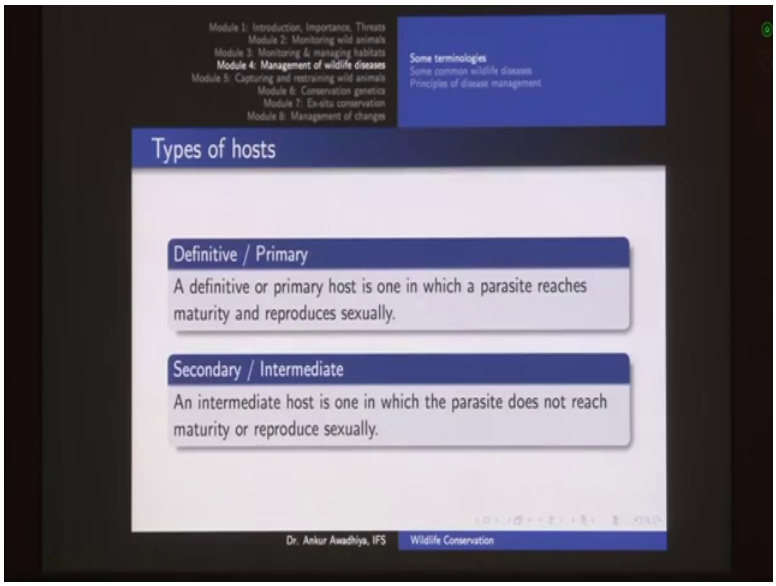

Then we differentiated between different kinds of host. The primary host in which the parasite is able to reach maturity and reproduce sexually. Secondary host in which it is not able to reach maturity or reproduce sexually.

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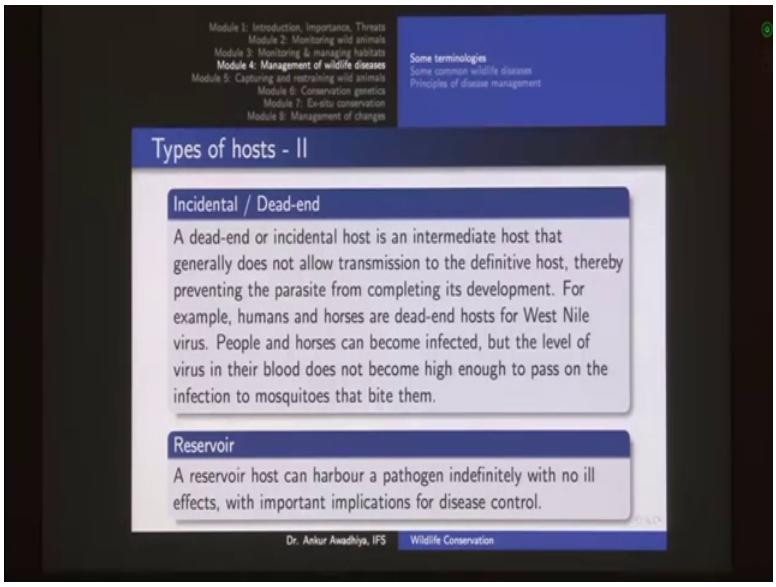

Then incidental or dead-end host that that gets the gets this guess, but is not able to transmit it further. Then reservoir that acts as a harbor.

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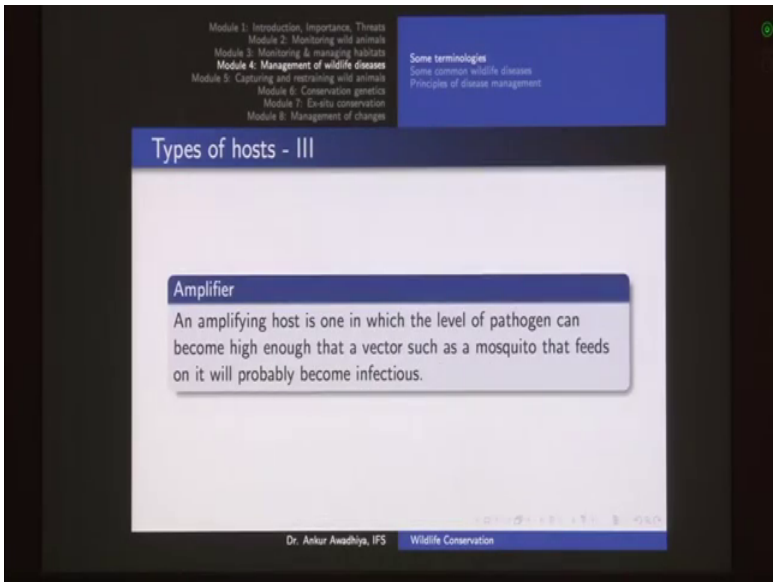

And then an amplifier in which case the pathogens is able to increase in numbers.

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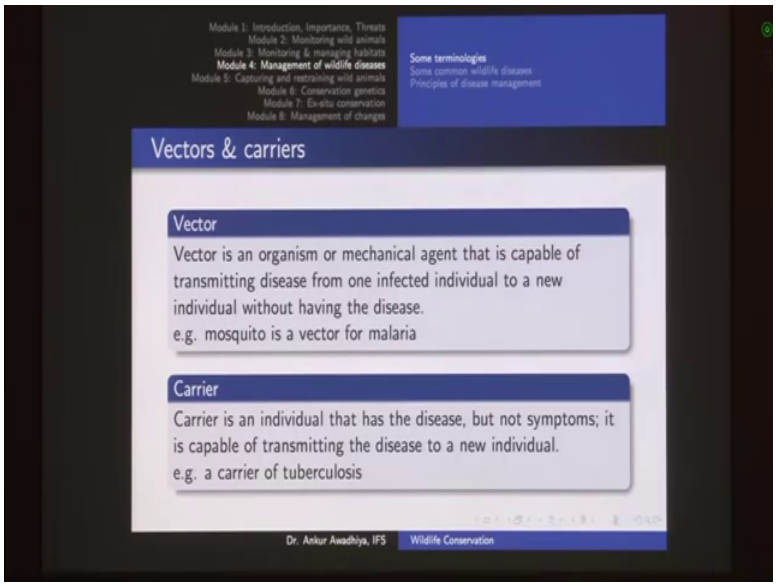

Then next we differentiated between vectors and carriers. So, vectors are those things or organisms that are able to move the pathogens from one place to another without getting the disease themselves. So, like mosquito is a vector formal area or like house flies are vectorous for cholera.

Then carrier is an individual that has this disease, but is not showing its symptoms. But, is at the same time it is transmitting this disease to someone else like carrier of

tuberculosis. So, this carrier will not show the features of tuberculosis, but this carrier will be infecting other individuals.

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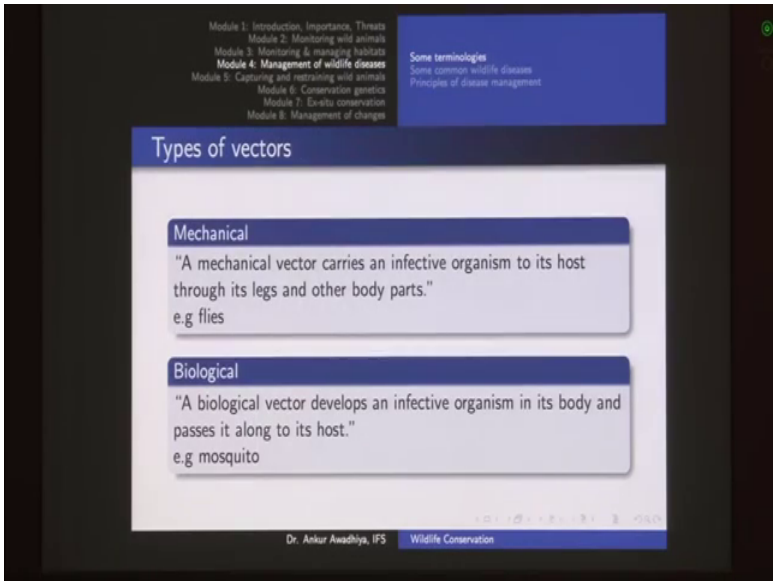

Now, we differentiated between mechanical vectors and biological vectors. So, mechanical vector is when it is when your pathogen is there on its leg and other body parts. And biological vector is when it gets inside the body, and then it comes out. So, for instance in the case of mosquito.

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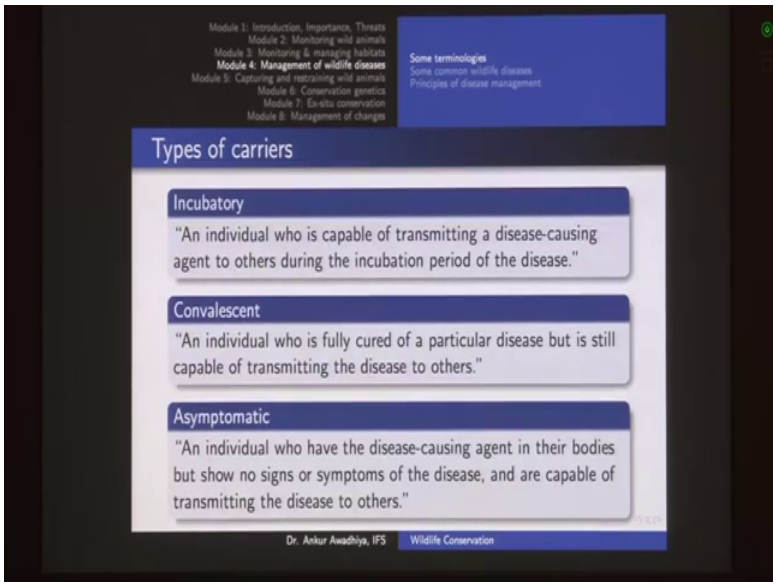

Now, in the case of carriers, we differentiated between incubatory carriers. So, these are animals that have just received this disease and this disease has not progressed to a stage that it would start showing the symptoms. Convalescent carriers in which these animals had their bought of disease, now they are recovering, but they are still capable of transmitting this disease to another animal.

Asymptotic carriers in which these animals are having these disease within them, but their immune system is strong enough to not show the symptoms, but then there are still transmitting it to others.

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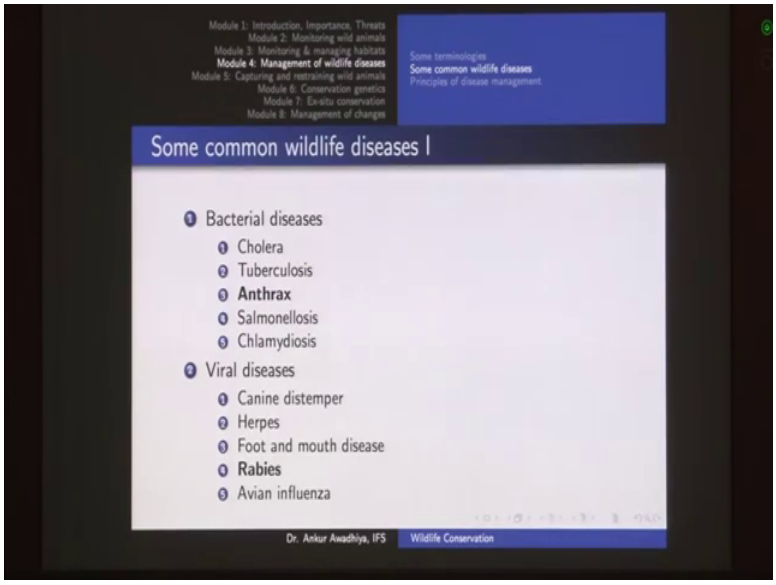

Then we had a look at some common wild life diseases. So, bacterial diseases include cholera, tuberculosis, anthrax that we discussed in more details salmonellosis, chlamydiosis. Viral diseases are canine distemper, herpes, foot and mouth disease, rabies, avian influenza.

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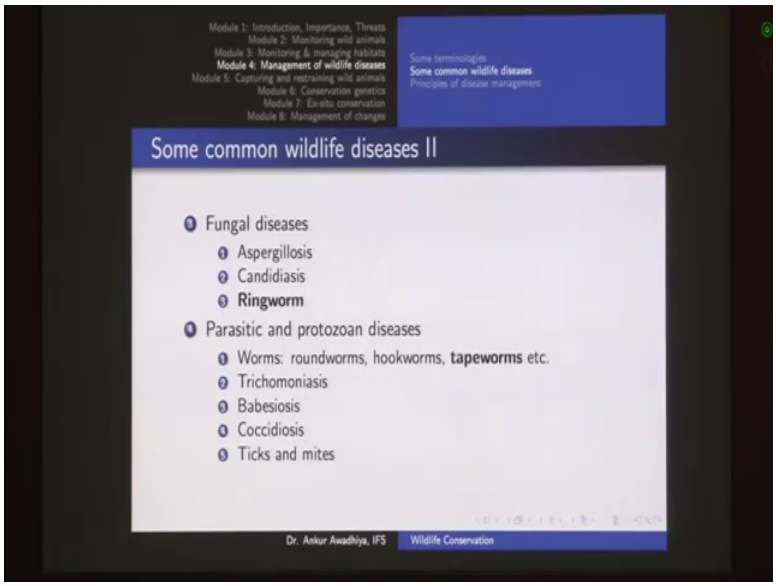

Fungal diseases are aspergillosis, candidiasis, and ringworm. And parasitic and protozoan diseases include worms, trichomoniasis, babesiosis, coccidiosis, ticks and mites.

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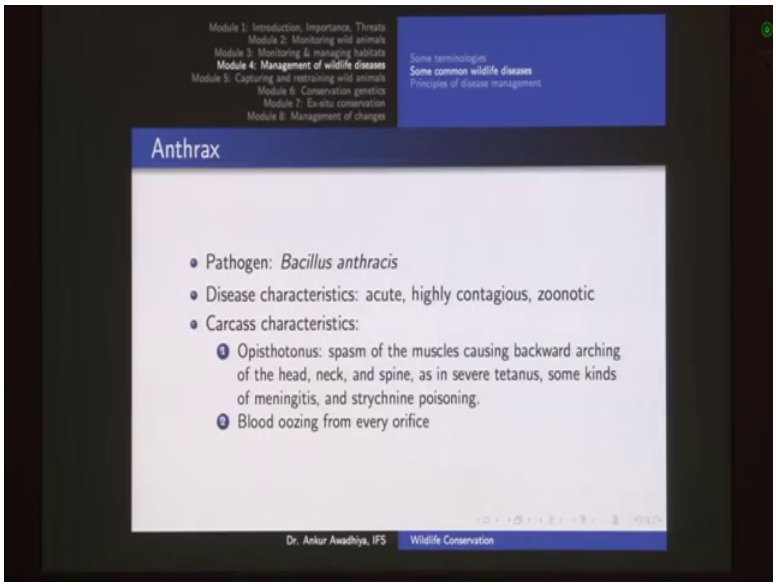

So, we began with anthrax.

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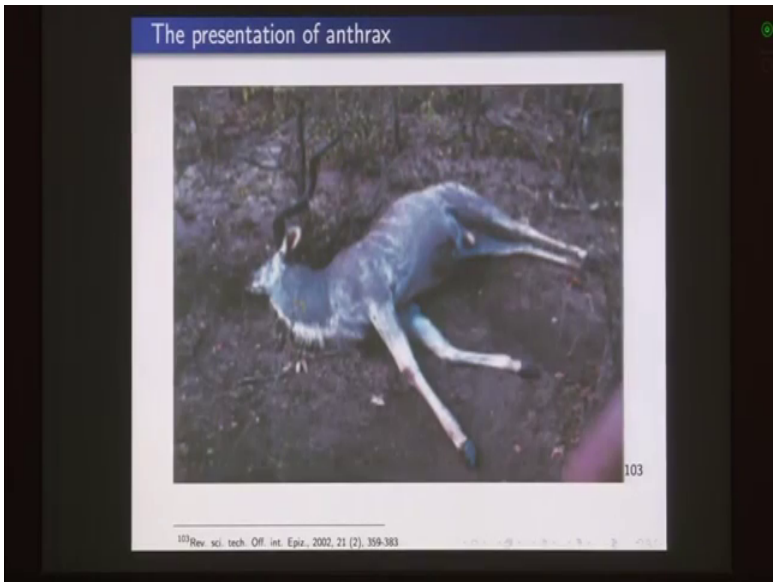

The most important factor is that if you see a dead animal, in which the neck has moved to the back, and there is blood whooshing out from every orifice, then it could be a case of anthrax.

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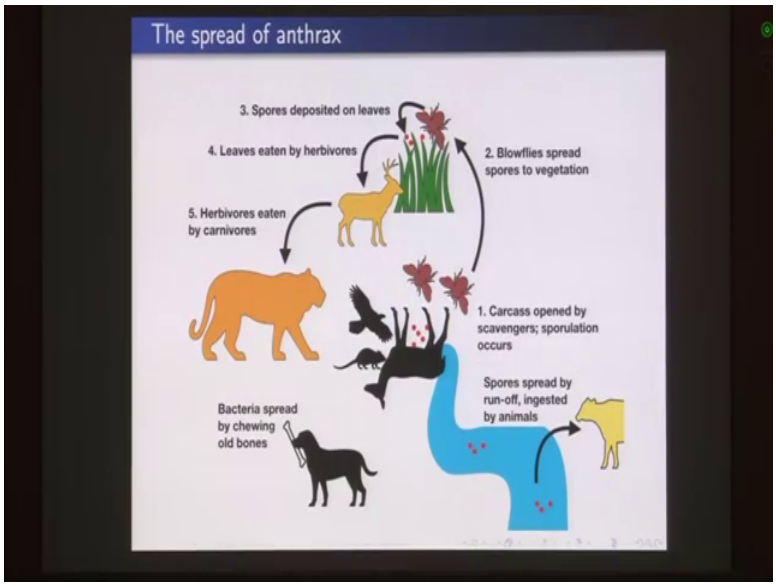

Now, in the case of anthrax if this animal has died, and if there are scavengers that open up its body or if go for a post mortem examination, so all these bacteria would convert into spores. And this spores would then further propagate throughout the system.

So, if there is an anthrax, we do not go for a post mortem examination. Then we looked at various vectors and carriers that spread these diseases around, then disease can also move through the water system. And so it is very important that the water systems are kept clean.

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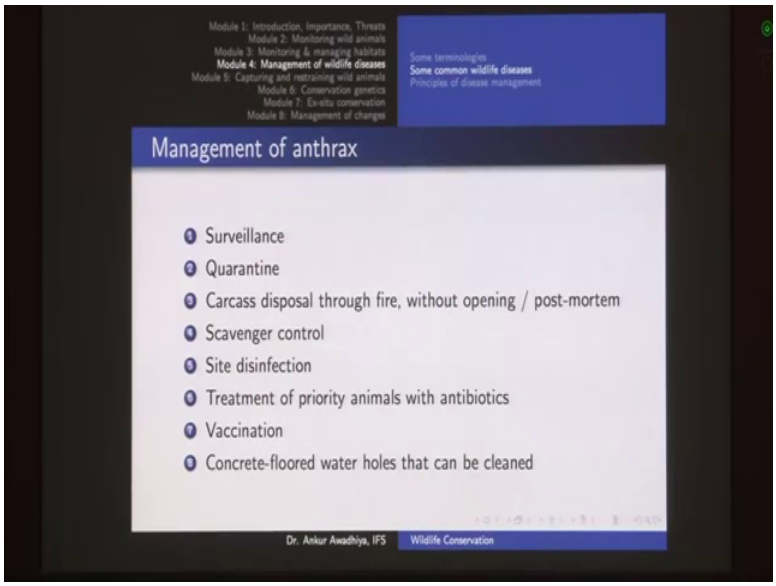

So, the management is surveillance, quarantine, carcass disposal through fire, so I you burn up the whole area, so that all this spores die out without opening or post mortem. Then control of scavenger's, site disinfection, treatment of priority animals with antibiotics.

So, for instance if there is an animal in your ex situ facility that has, this disease you will give it the antibiotics. Vaccination and then also concrete-floored water holes, that can be cleaned, because this bacterium can move through our water systems. We need to clean them periodically.

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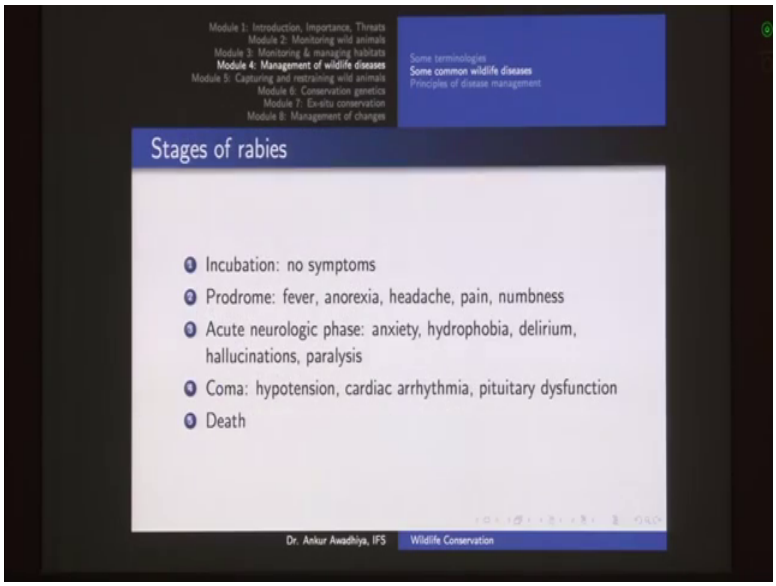

Next we had a look at rabies. So, there are five this is a viral disease, and there are five stages. One is incubation, where the animal does not show any symptoms. Next is prodrome, there you get all the symptoms of flu. So, in this case, you get fever, you lose the appetite the animal gets headache, pain, and numbness.

Then you have neurological phase in which the animal shown anxiety, hydrophobia, so it is not able to drink anything, it is not able to swallow anything. Delirium in which the animal becomes confused, hallucinations and paralysis and then this stage the animal might even come out and bite other animals. Then you have the stage of coma in which the animal gets cardiac arrhythmia, pituitary dysfunction, and hypotension followed by the death of the animal.

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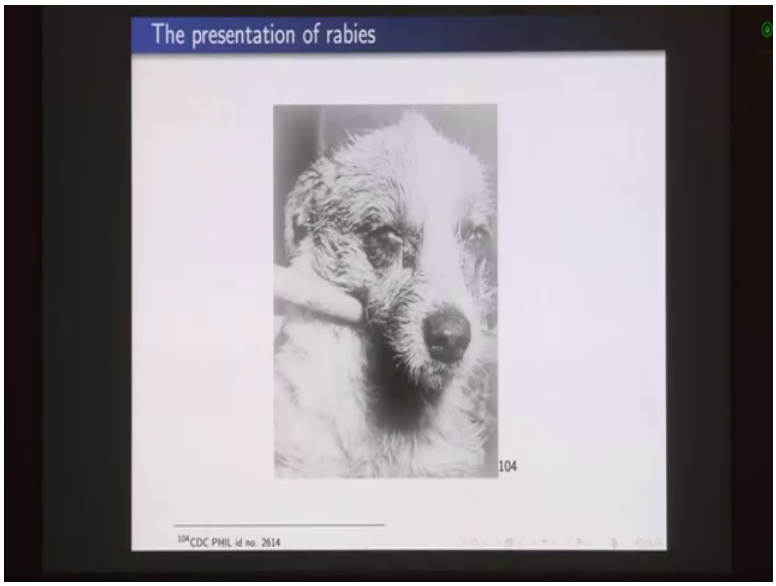

And in this case, this is how an animal would look.

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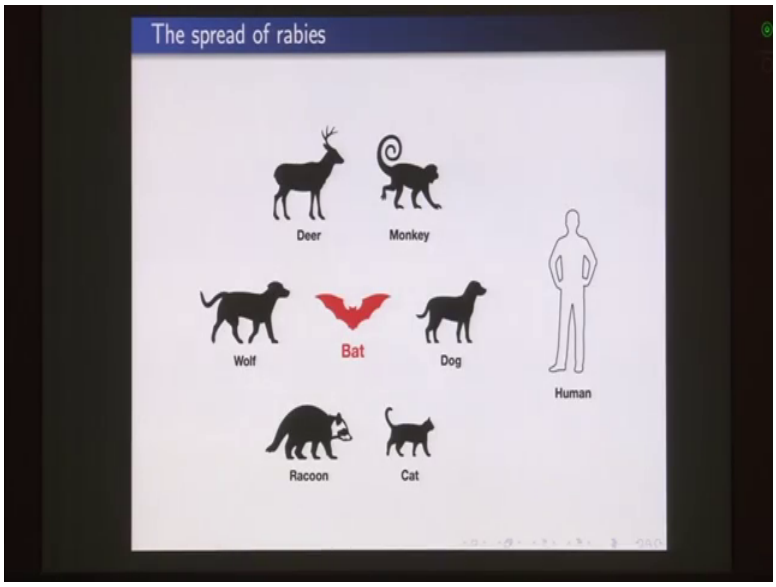

And there are a number of animals that can act as host for this virus.

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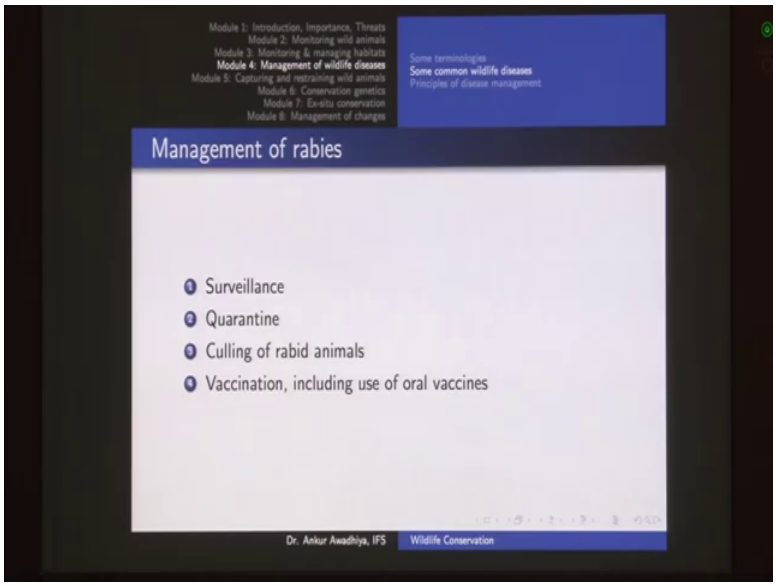

And management includes decides other things. You also have vaccination through the use of oral vaccines in the case of wild life.

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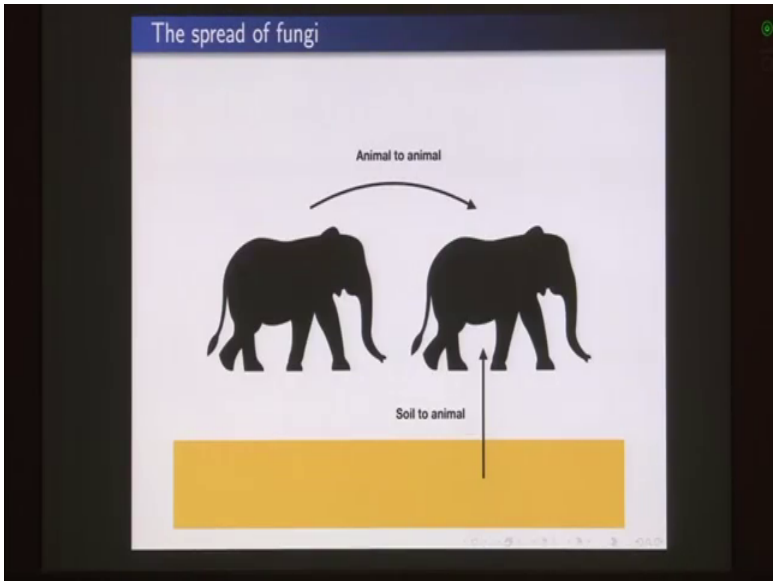

Next we had a look at fungal infection called ringworm, so it results in itchy patches. And then this can split from animal to animal, and this can also split from the soil to the animal. So, even if you do not have ringworm in the system, it may come up suddenly.

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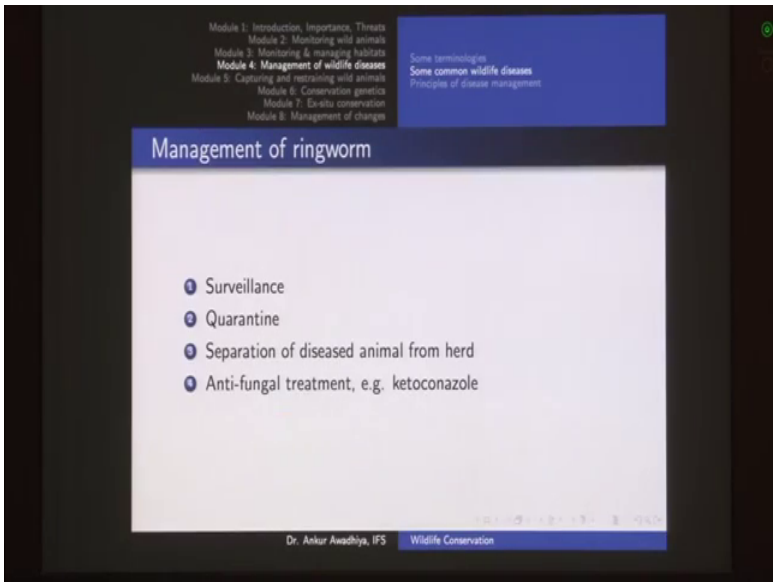

And you need to keep the animal dry, you need to use some antifungal treatments, and you need to separate the disease animal from the herd, so that it does not spread the disease any further.

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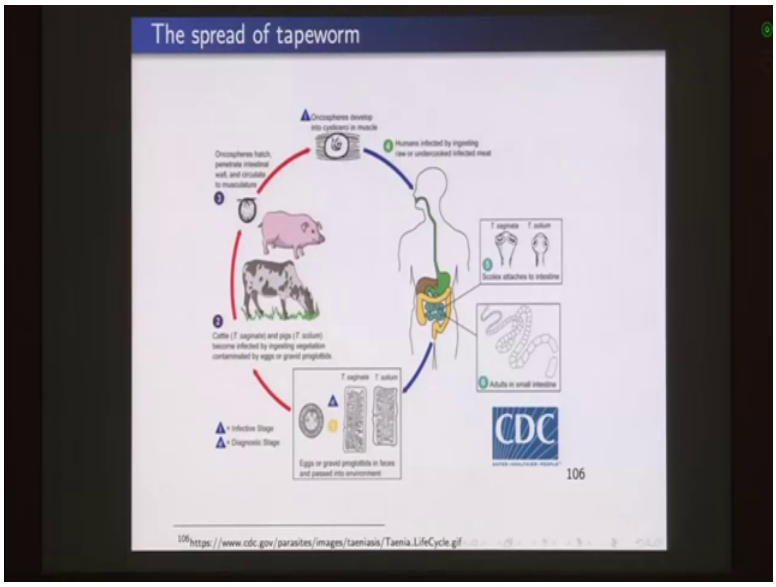

Next we had a look at tape worm, which is a parasitic disease.

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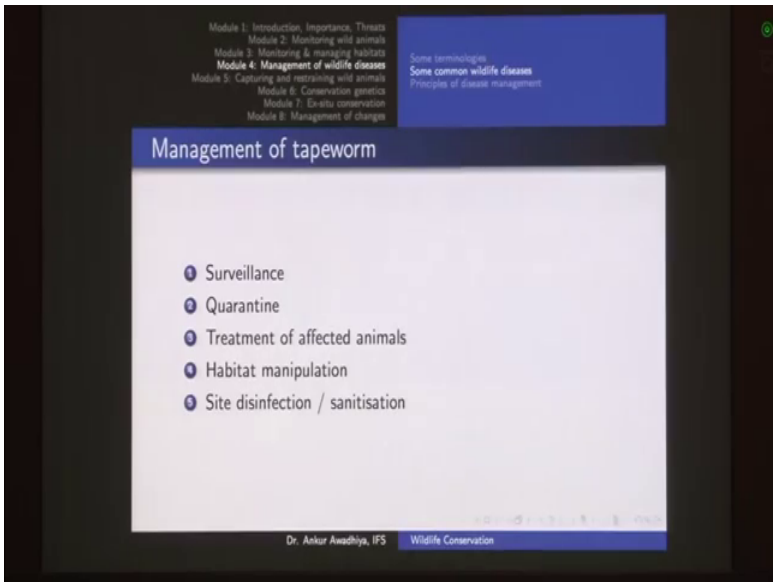

And in this case also you are main control mechanisms are surveillance, quarantine, treatment of affected animals, habitat manipulation, and site disinfection or sanitization.

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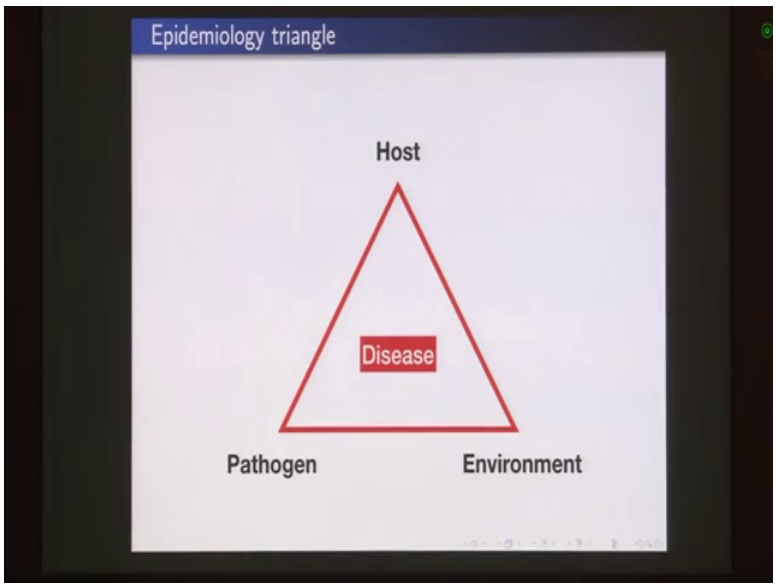

In the next lecture, we looked at the principles of disease management. So, epidemiology triangle can be remembered by the term HPED. So, host, pathogen, environment, gives you the disease host pathogen and environment.

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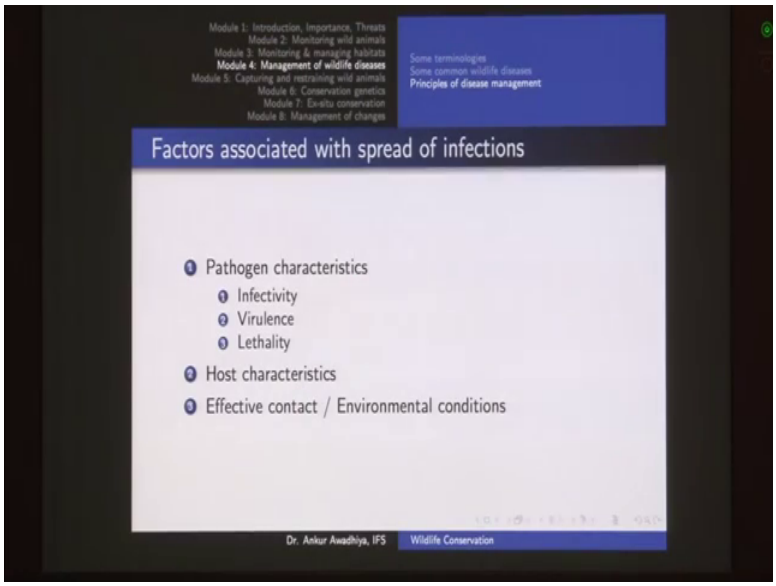

Next you we had a factors that are associated with spread of diseases. So, you have pathogen characteristics, host characteristics, and environmental characteristics. So, pathogen characteristics include infectivity, virulence, and lethality, so we defined all of them.

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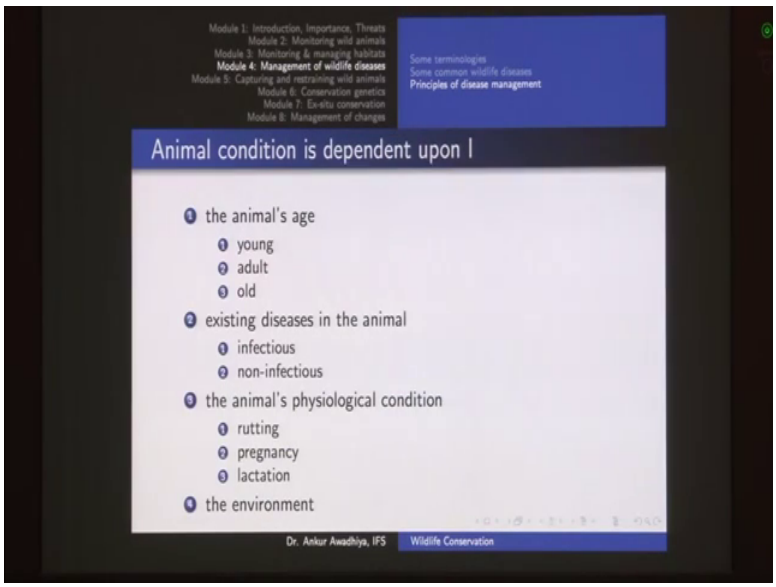

Animal characteristics would be the age any prevailing diseases, the physiological condition, the environmental conditions, and the ecological condition.

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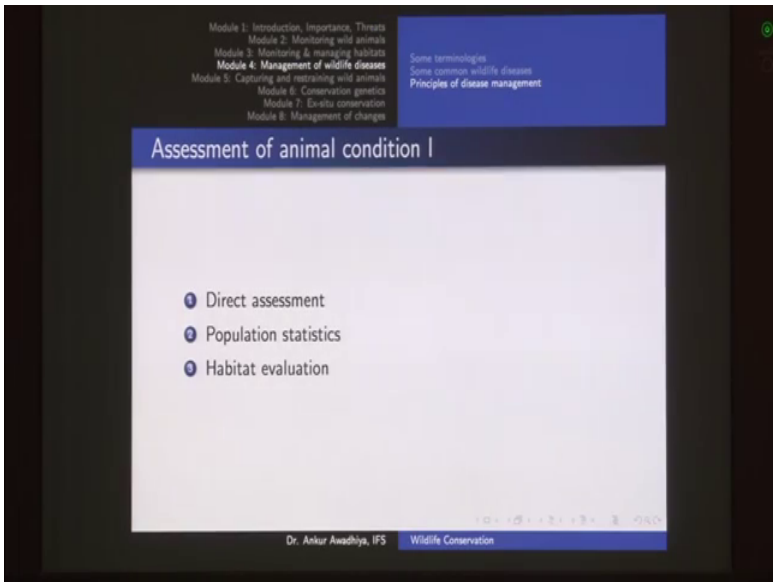

Now, assessment of annual condition is done through three methods. One is direct assessment in which you look at the animal or any of its body parts, then you have population statistic and you also have habitat evolution.

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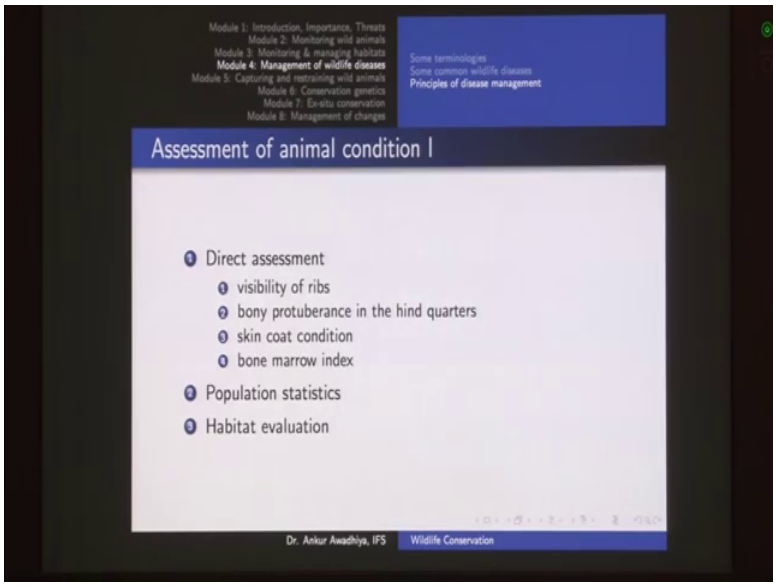

So, next we looked at direct assessment. So, you have visibility of ribs, bony protuberance in hind quarters, skin coat condition, and bone marrow index.

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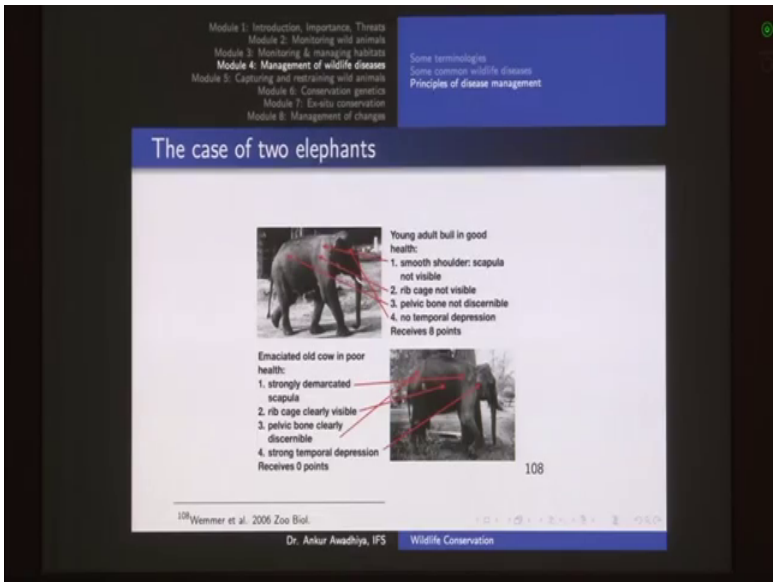

So, this is we looked at the condition of these two elephants.

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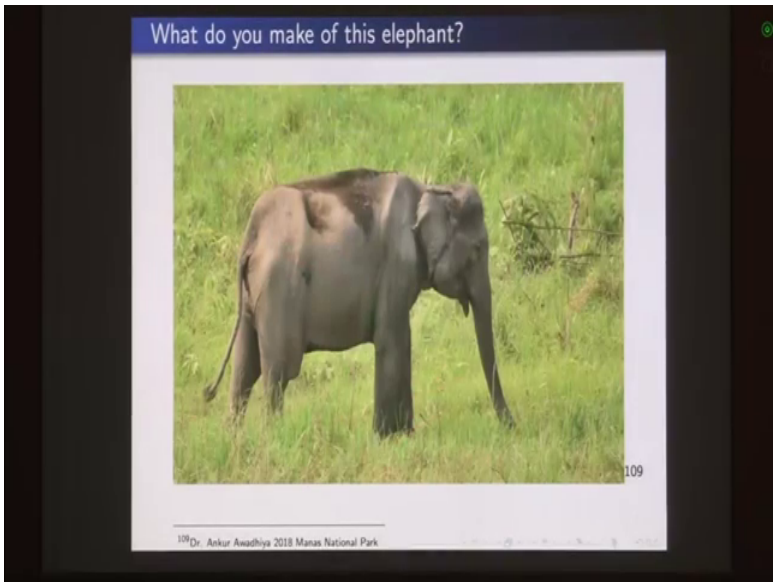

And so just by looking at the condition of an of an animal, you can tell whether it is healthy or whether it is sick.

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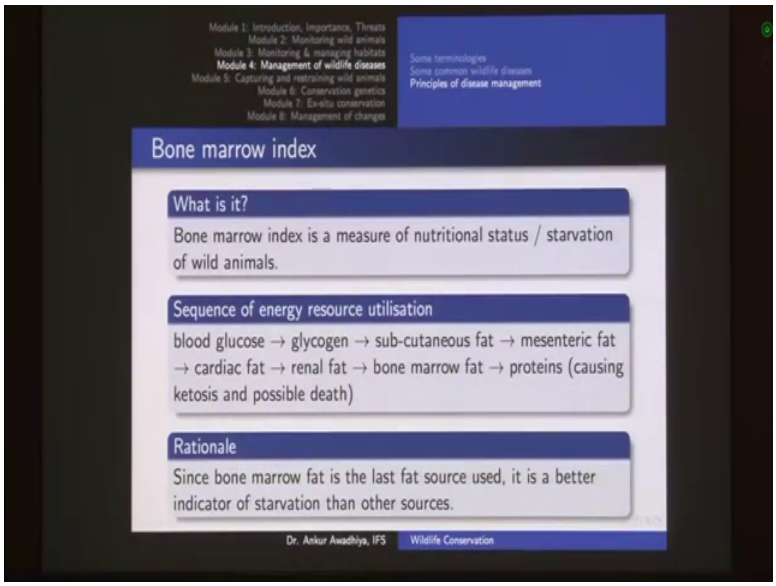

Next we had a look at the bone marrow index. So, whenever an animal is starving, this is the sequence of energy resource utilization. And bone marrow comes as the last fat. Reservoir, which is followed by proteins which leads to death or probably ketosis; so, bone marrow is the last fat use fast reservoir that is used, so which is by it becomes a very good indicator of the health of the animal.

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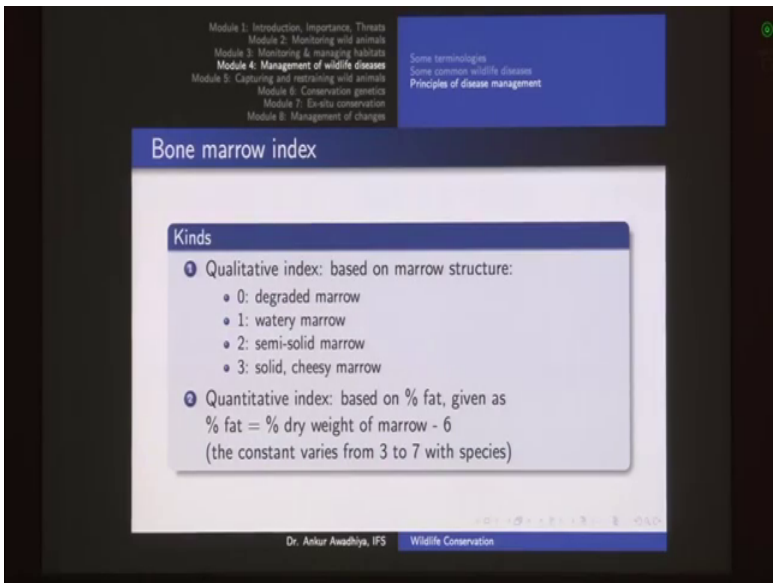

So, we have qualitative index and qualitative index. So, qualitative index is whether your bone marrow is looking like cheese or whether it is looking extremely degraded. And quantitative index is based on the percentage of fat.

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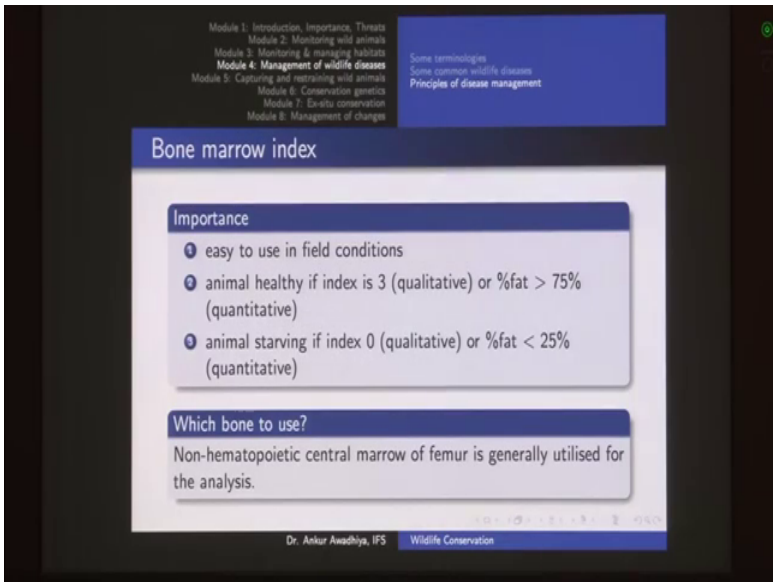

And in this case you go for the non-hematopoietic central marrow of the femur is generally utilized, because this is the large bone, this is easily available. And you can very easily break it apart and have a look inside.

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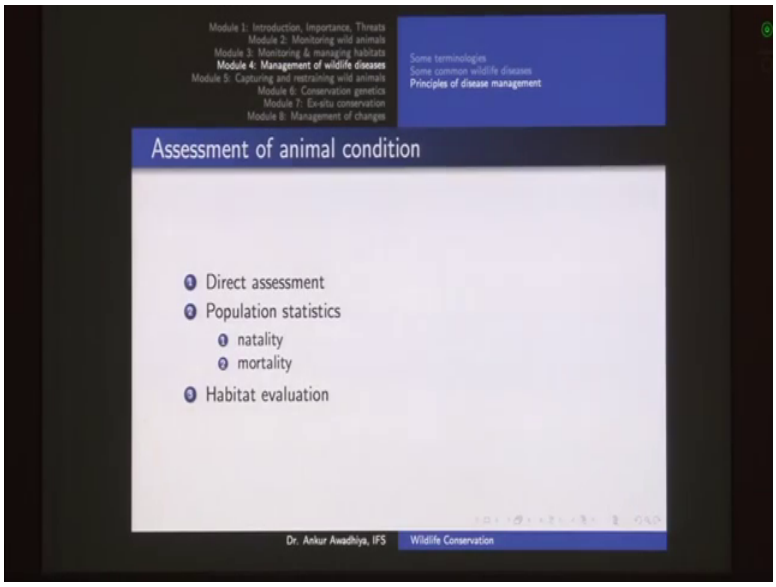

Next is population statistics. So, we have natality or whether the animals are having off springs and also the mortality.

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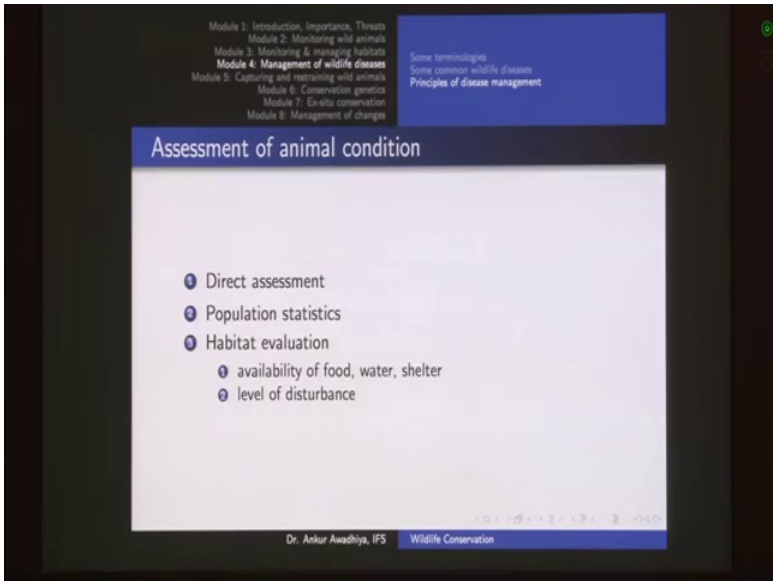

In the case of habitat evaluation, we look at the availability of resources, and the level of disturbance.

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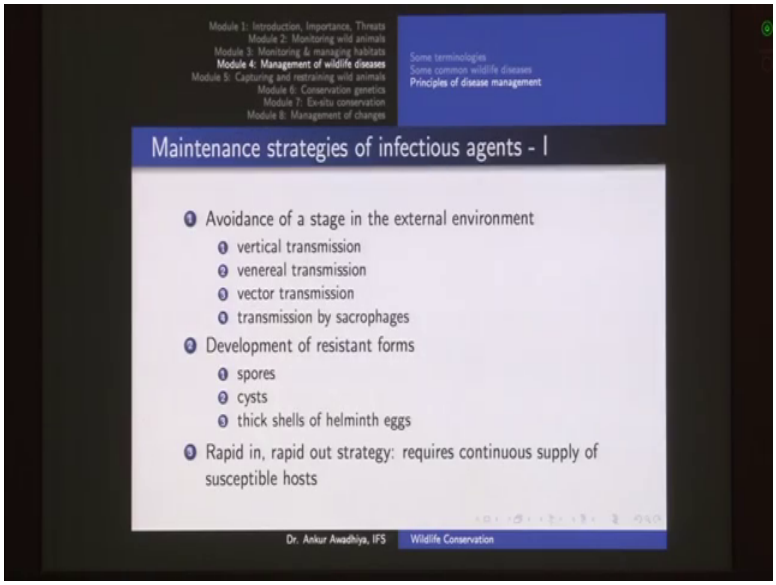

Now, there are these roots of infection, and the maintenance strategies of infectious agents. So, we need to understand these maintenance strategies, so as to be able to break those.

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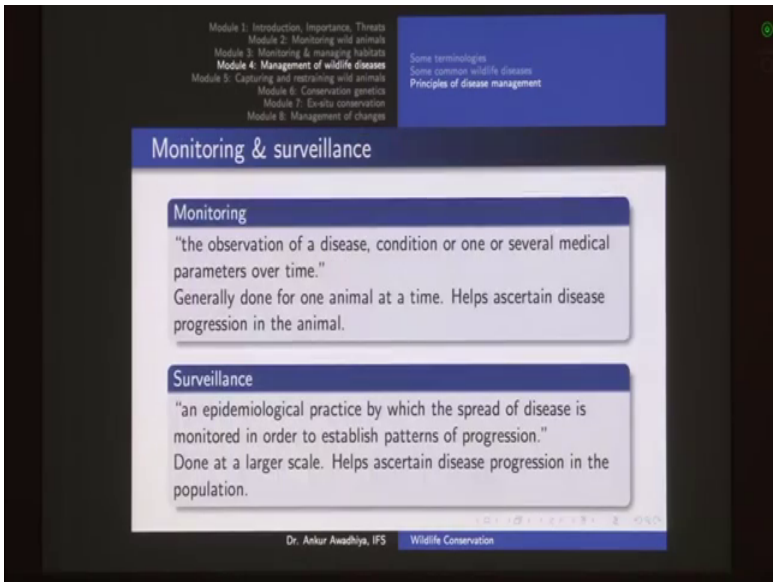

Next we differentiated between monitoring and surveillance. And in the 5th module, we began with capturing and restraining of wild animals.

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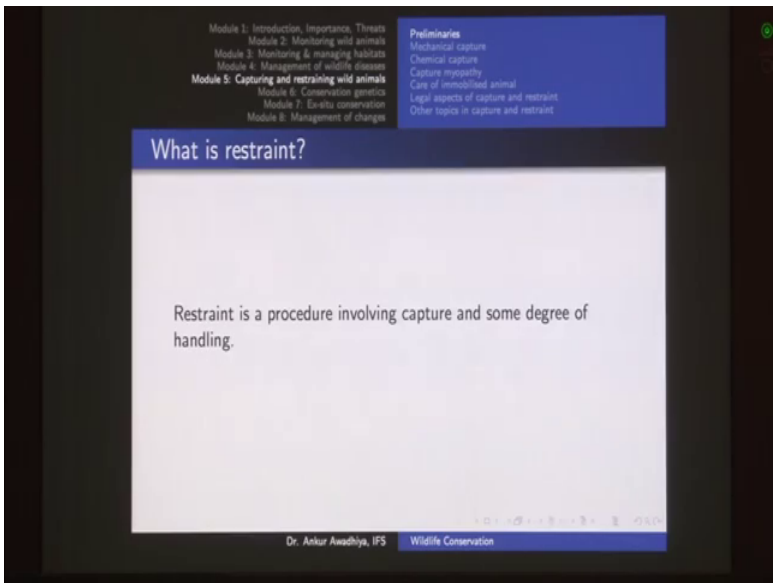

So, what is restraint? Restraint is a procedure that involves capture and some degree of handling.

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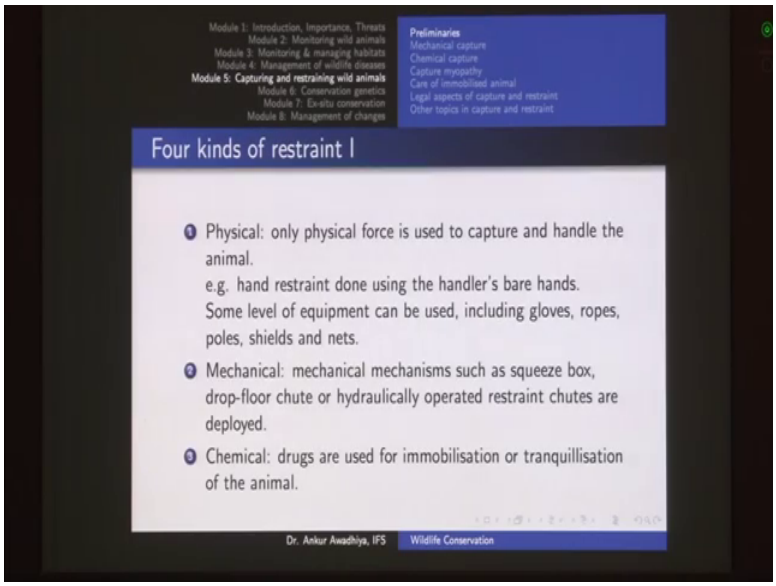

And there are four different kinds of restraint. Physical restraint that only uses force. Mechanical restraint in which you some mechanical mechanisms. Chemical restraint in which we use drugs.

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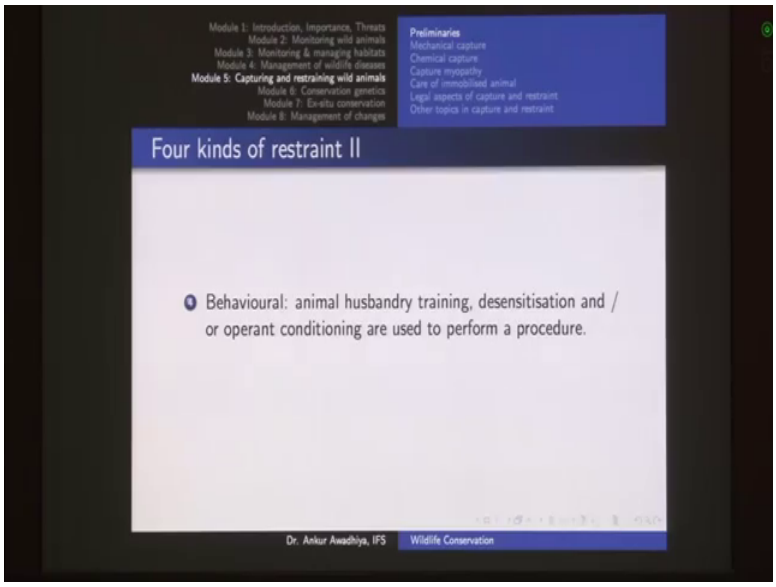

And 4th is the behavioral restraint in which we go for training and desensitization.

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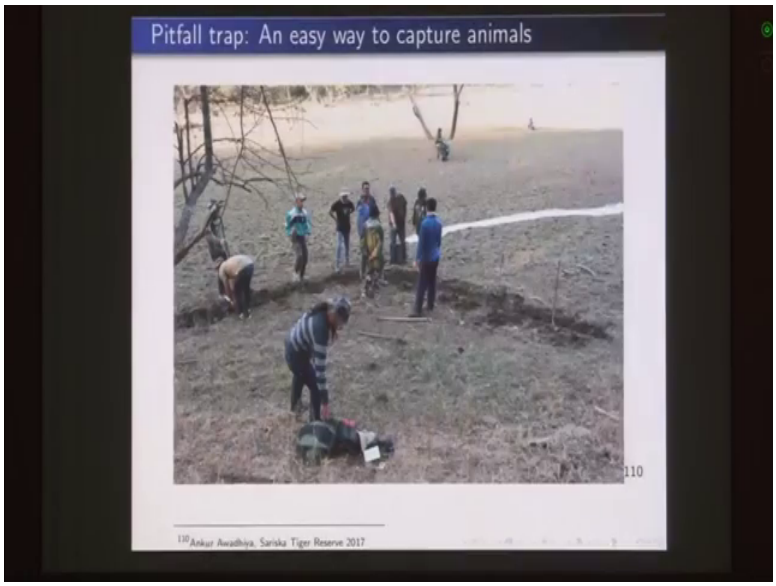

Now, we looked at certain capture and restraint situations, where it may be required in important points to note. Next in the case of mechanical capture, these are the backgrounds that need to be kept in mind. We looked at pitfall trap in great detail as an easy way to capture animals.

So, you dig up a hole, then you install buckets, raise post, place a polythene sheet, tie it up, then cut off any over hangs, put some shelters inside, and then you leave it.

Then next day or after x amount of time, you can go back there you can plot all of these buckets, and look at what animals are inside. And once you get these animals, you can then do your measurements. So, we looked at their advantages and disadvantages.

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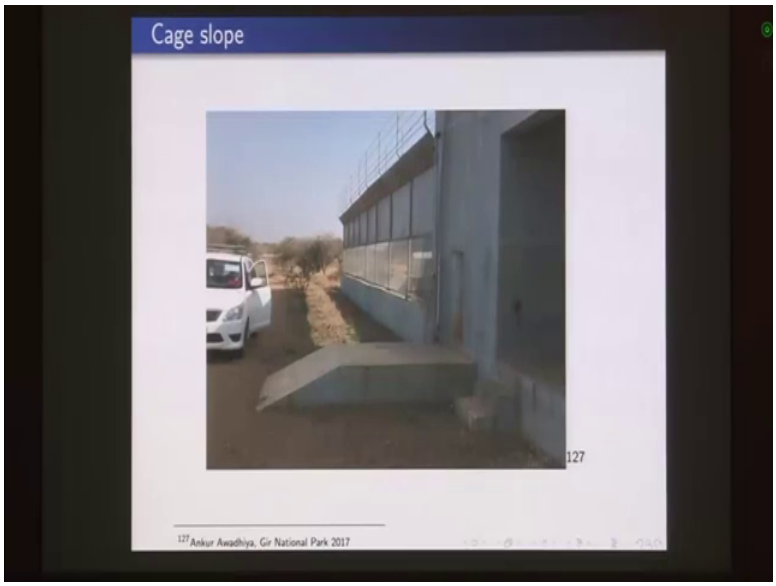

And then we looked at working of a trip device, cages. Now, if you are carrying an animal in a cage, then you require this slopes, so that your cage can be moved here to this is small opening, which when opened, and you opened your cage door and the animal is able to get inside.

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Next we had a look at the squeeze cage that is used for the handling of animals. So, essentially you bring your animal inside here, and then you move this wheel, so that both of the walls come together. So, you have three walls here, and the middle wall moves, so

that your animal is squeezed between two of these walls. And then you can take out blood samples, so you can give it some medicines, and so on.

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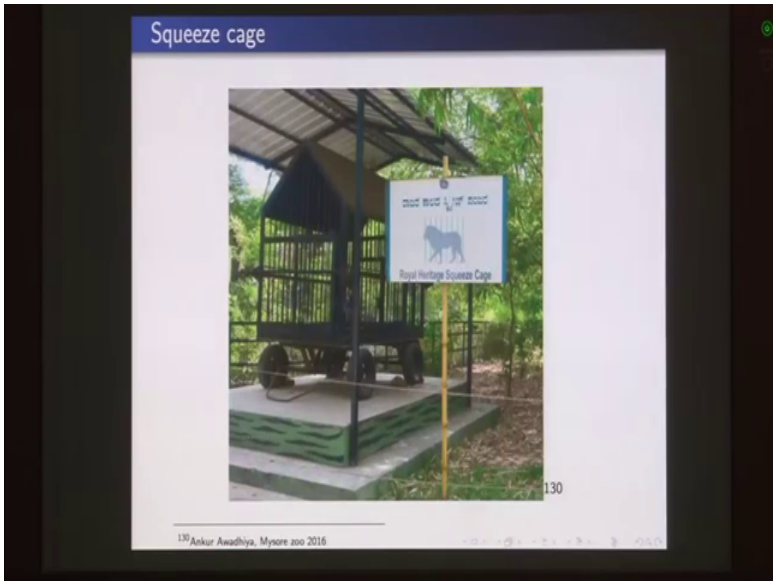

So, a squeeze cage has been used for quite some time.

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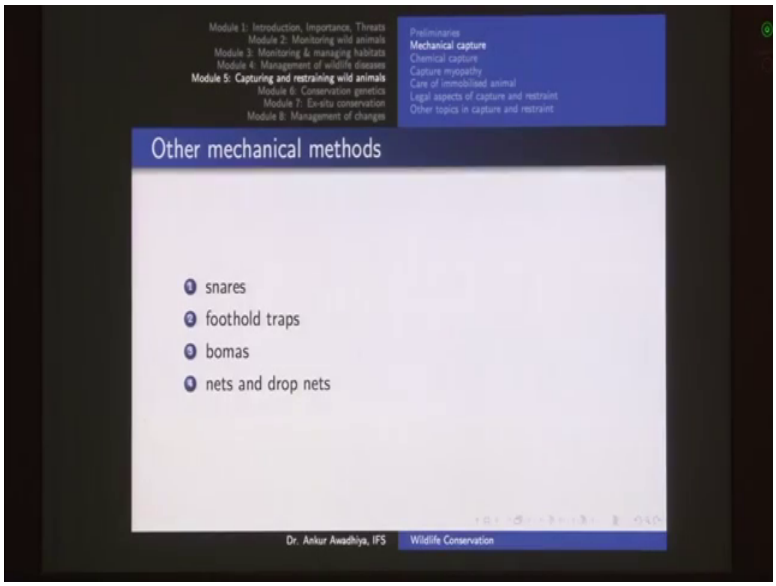

Then we had a look at rope noose, and other mechanical methods are snares, foot hold traps, bomas, and nets and drop nets.

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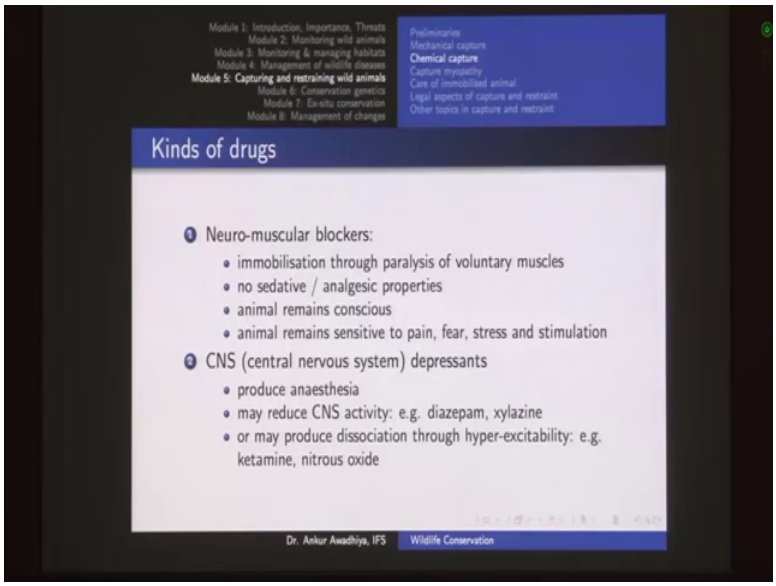

Next we looked at chemical captures. So, in chemical capture, we use two kinds of drugs. One is neuro-muscular blockers, which give certain amount of paralysis. And then there are your CNS depressants, which reduce the functioning of the CNS or in certain situations, they produce a dissociation.

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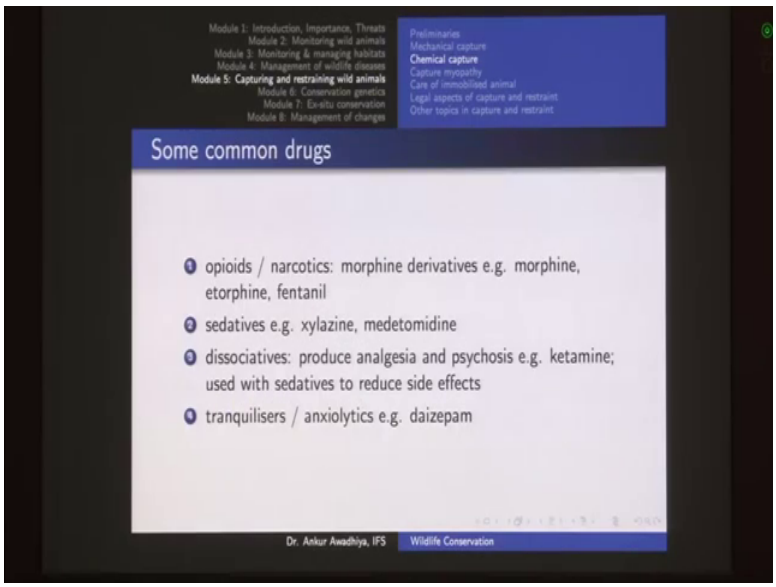

So, some common drugs are opioids, sedatives, dissociatives, and tranquilizers.

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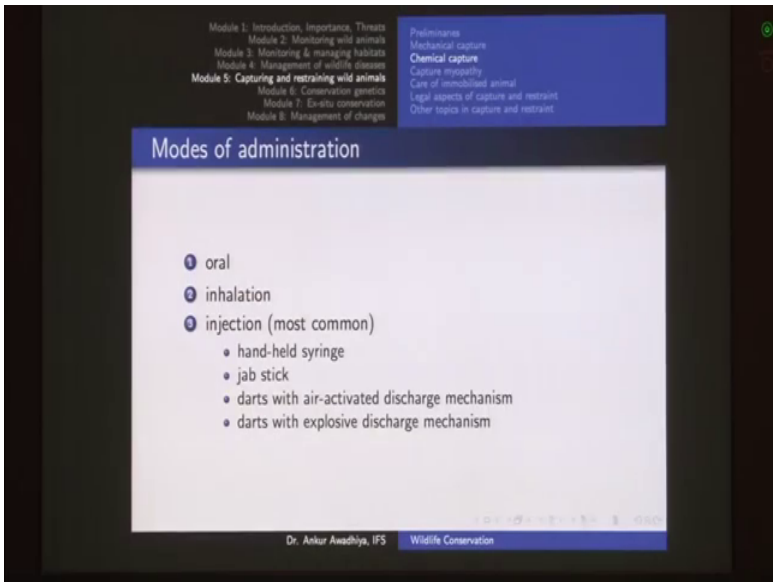

So, then we had a look at modes of administration it is oral inhalation or injection and in the case of injection you can have a hand-held syringe you can have a jab stick or you can use darts. Now, darts can be propel using air guns or they can be propelled using gunpowder-charge.

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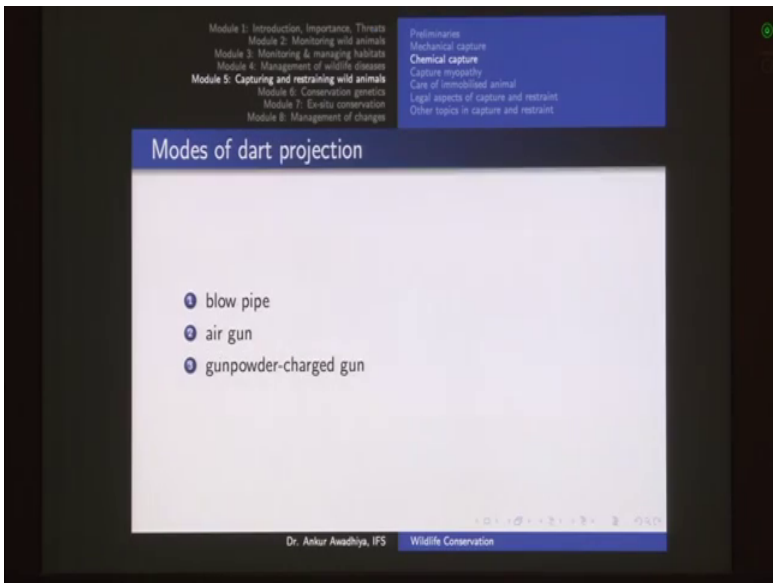

So, then we had a look at blow pipe, air gun, and this is air gun and then we also had a look at the gun powder gun and this is the method of dart preparation. So, what will steps are required. So, we went into it in great detail.

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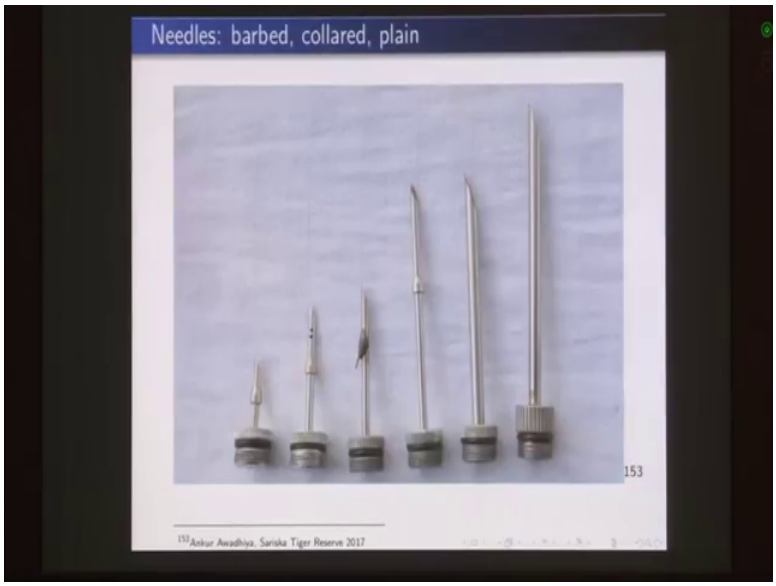

Then we looked at speedy dots different kinds of needles, the barbed needle, the collared needle and the plain needle. So, plain needle is used when you want this dart to get inside and then quickly come off. Your barbed your collared needle is used when you want this dart to remain in the animal for some time. And a barbed needles is used in situations when you want your dart to remain with the animal till you go and remove it surgically.

So, we looked at speedy darts, dan inject and then we will had a look at the gunpowder dart gun. So, you have a site adjustment this is how the dart looks and you have different kinds of charges. And you should never put a plastic dart in a gun powder gun otherwise it is it will not work properly.

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And then approaching animal can beyond helicopters or on elephant backs or maybe even on ground. And then this is a good position to dart the animal. So, one position is this (Refer Time: 24:43) portion and the second is on the shoulders where you have adequate amounts of muscles.

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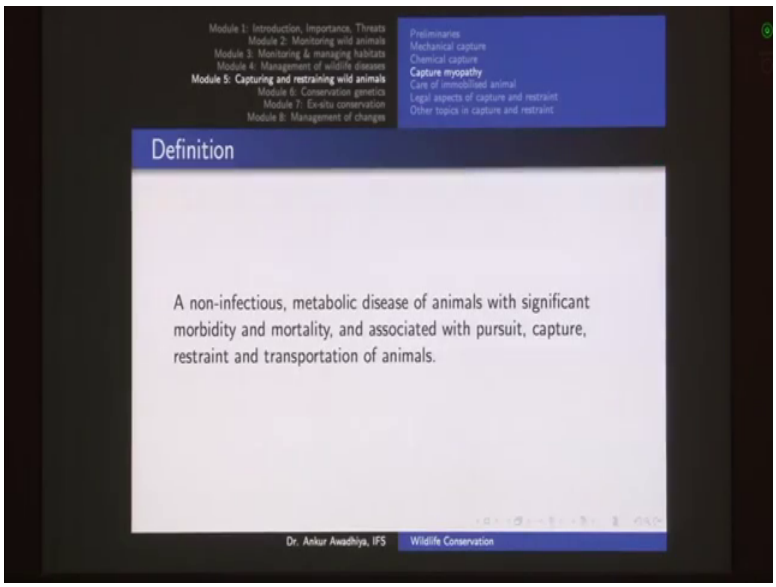

Next we had a look at capture myopathy. So, it is a non-infectious, metabolic disease of animals which significant morbidity and mortality and is associated with pursuit, capture,

restraint and transportation of animals. So, these are the clinical signs. We looked at different names that are used for this disease.

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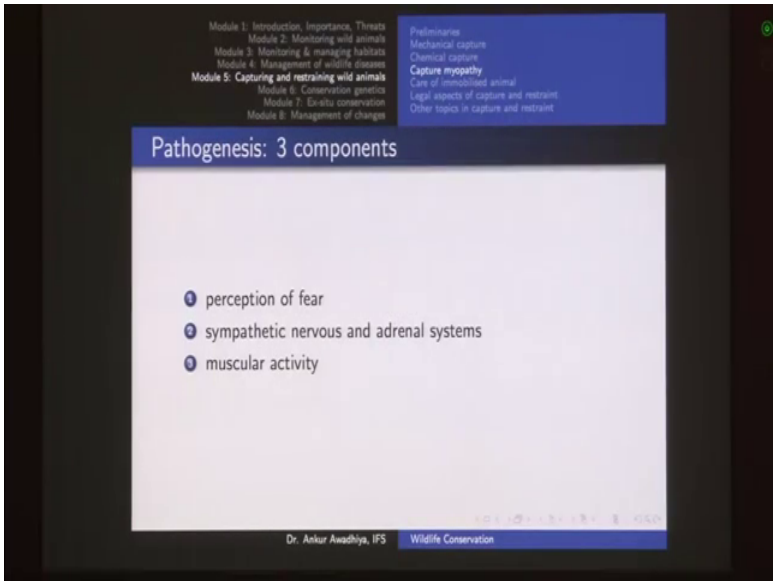

The predisposing factors and then in pathogenesis there are three components. The animal gets a perception of fear because of fear it has a sympathetic nervous system response it releases adrenaline into the blood. And because of this there is intense level of muscular activity, the muscles then break down because of deposition of lactic acid and then you have myoglobinuria.

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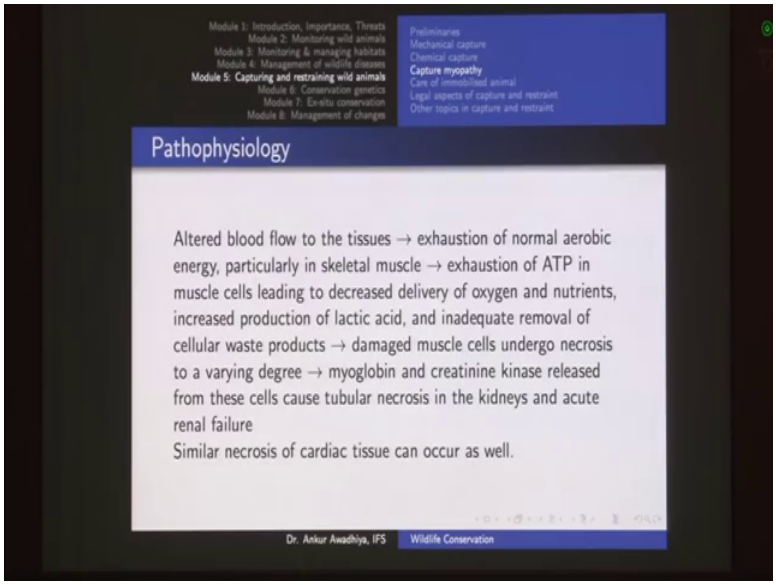

So, this is the pathophysiology.

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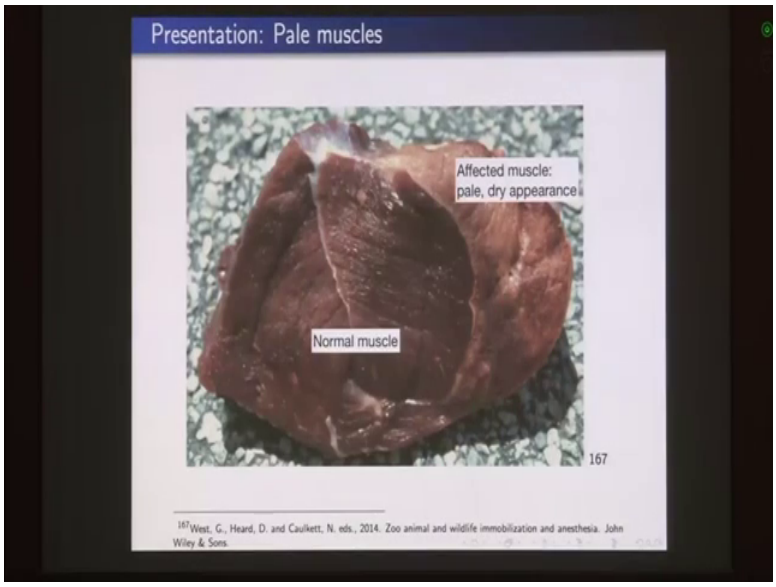

And this is the presentation. So, if we look at the muscles, so this is a normal muscle and this is unaffected muscles; so, it is pale and dry in appearance because all the myoglobin has moved out into the blood.

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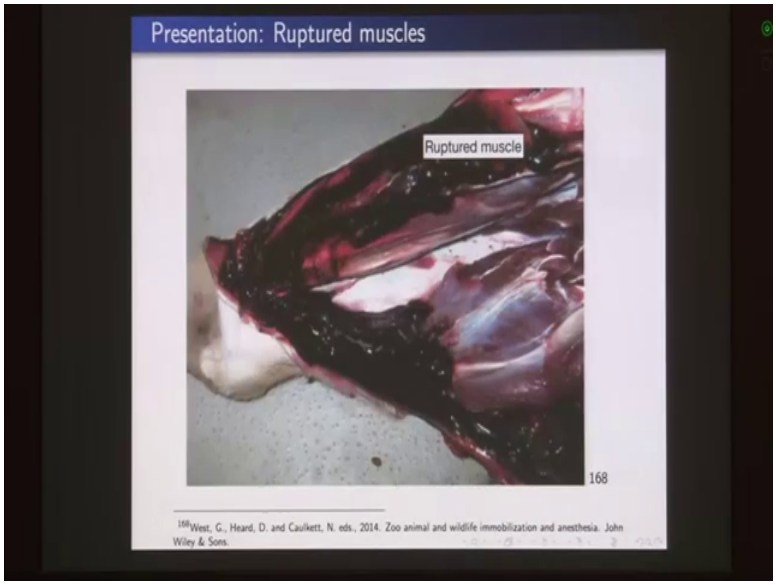

And then you can also see ruptured muscles in which your muscles have quite a lot of lactic acid and then finally, the rupture out.

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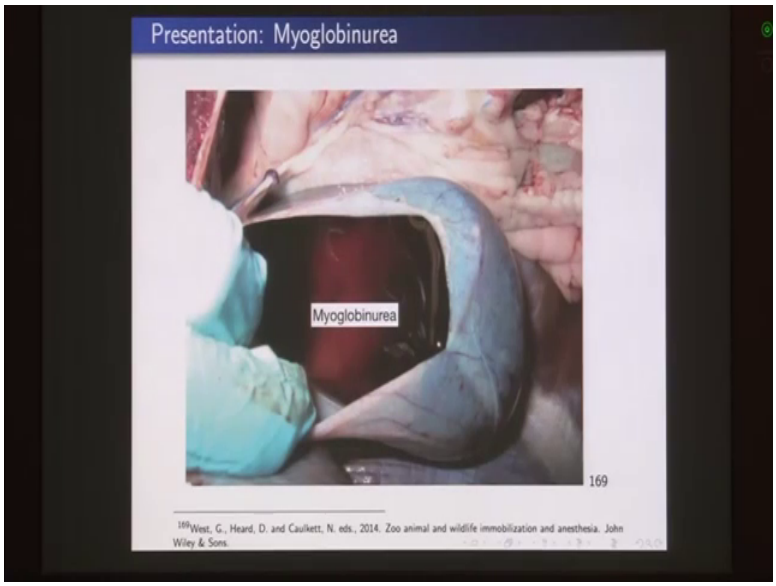

And then the third thing is myoglobin urea in which your this urine of the animal becomes red in color because it is now having myoglobins that are that have moved through the kidneys and they have also damaged the kidneys. So, treatment has a very low success rate. So, we have different treatment options, but they do not work very well.

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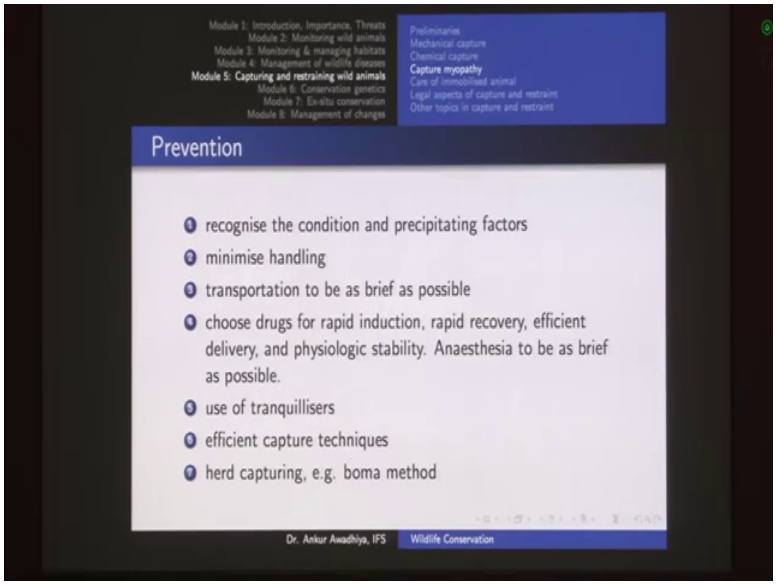

So, prevention is the only key. You minimize handling you recognize the conditions, and the precipitating factors, transportation is should be as brief as possible, use tranquilizers,

choose drugs properly, efficient capture techniques in herd capturing that is the boma method.

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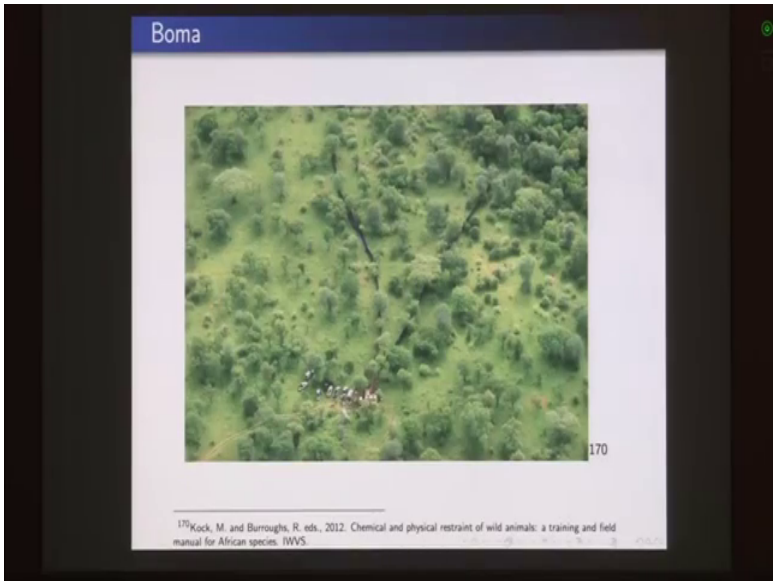

In the boma method you create these walls out of plastic sheets and then you drive whole of the herd together when the herd comes inside you close this area then you drive it further when it comes to a smaller area, you have another grid that should be close and then all of these animals as a herd move into your vehicles and then they are transported very quickly. Now, because these animals are moving in the herd they do not sense a lot of fear and because of which capture myopathy can be avoided.

Next we had a look at the care of immobilized animal. So, things may go wrong and different things need to be monitored.

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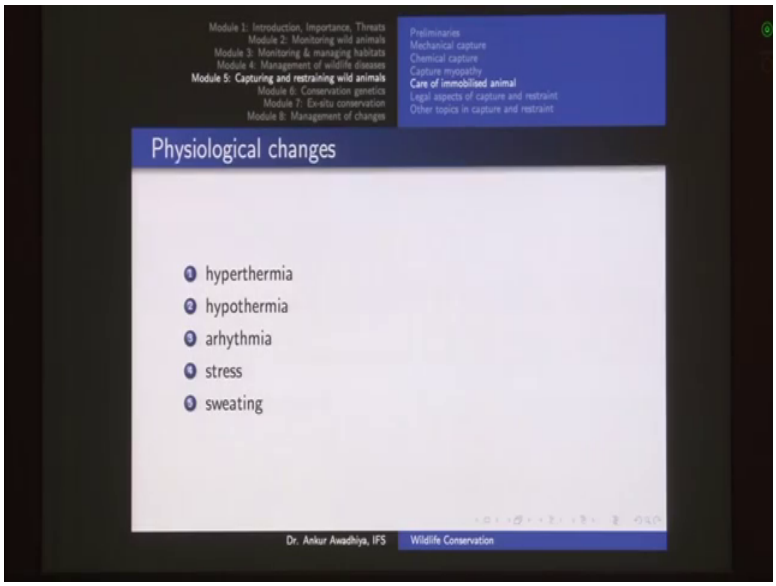

Things like hyperthermia, hypothermia, arrhythmia, stress and sweating.

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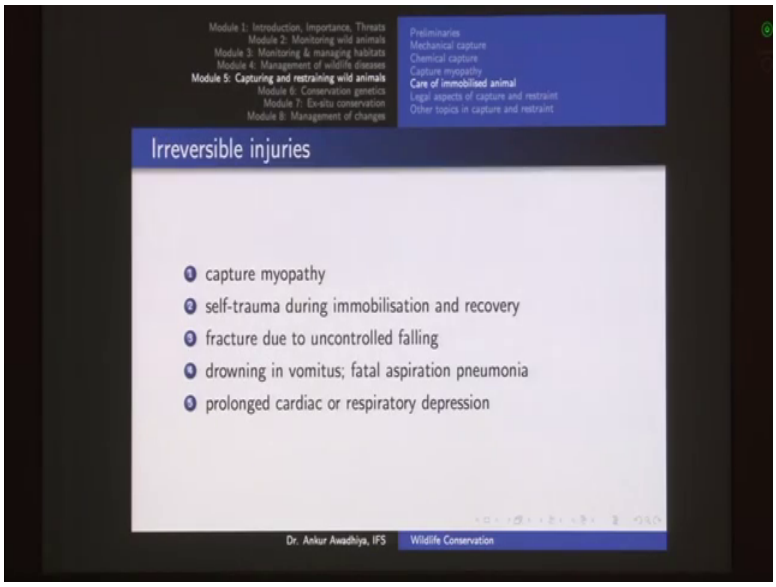

And then there are a number of irreversible injuries we have to look at anesthetic depth.

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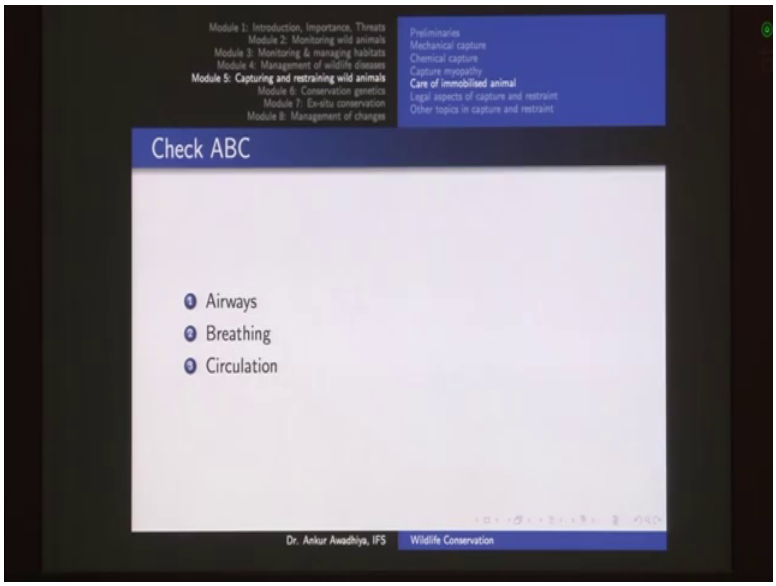

So, most important thing is checking off ABC airways breathing and circulation. So, the airways should be clear there should not be any mucus there should not be any liquid that is blocking the airways the tongue of the animals should also not be blocking the airways. And in the case of elephants the truck needs to be kept out it should not come below the body in which case it will be blocked.

Next is breathing. So, the animal should be breathing properly. So, you can put your fingers in front of its nose to see whether the animals breathing properly or you could go with a stethoscope. And next is circulation so, whether the heart is pumping the blood properly, whether the blood is getting oxygenated or not.

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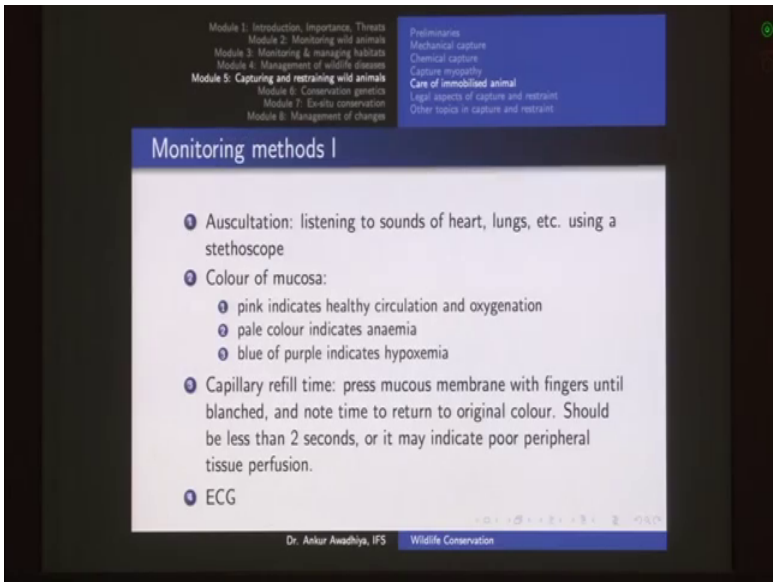

So, in the case of circulation, there are two important things one is the color of the mucosa if it should be pink or reddish in color if it becomes pale then it means that the animal has anemia. If it is becomes blue then it means that the blood is not getting oxygenated. And second is the capillary refill time in which you press certain areas of the animal to drain out the capillaries then you release the pressure and you see how much time it takes to reach to the original color. And it should be less than 2 seconds, otherwise there is a problem of poor peripheral tissue perfusion. Then you can also use equipments like stethoscope or ECG droplet flow and so on.

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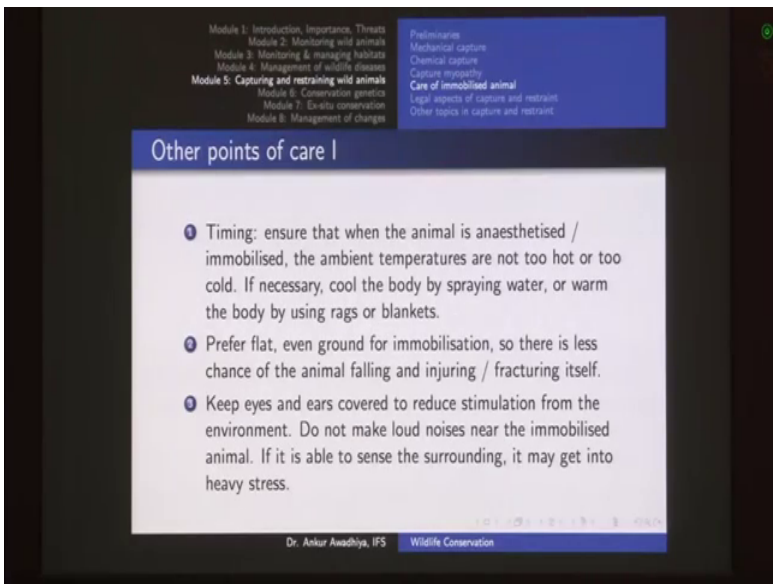

So, other points of care are that you do your operation in the right time. So, ambient temperatures in the environment should not be too high or too low. So, we normally go for early morning operations. If it is necessary you cool the body by spring water or warm the body by using the rags or blankets. Then we prefer flat ground for immobilization. So, the animal does not topple down and there should not be a large sized water body in which the animal could drown. Then keep eyes and ears covered to reduce stimulation from the environment because of the animal is getting stimulation then not only do the drugs take more time to action, but then there is also a chance of getting a capture myopathy.

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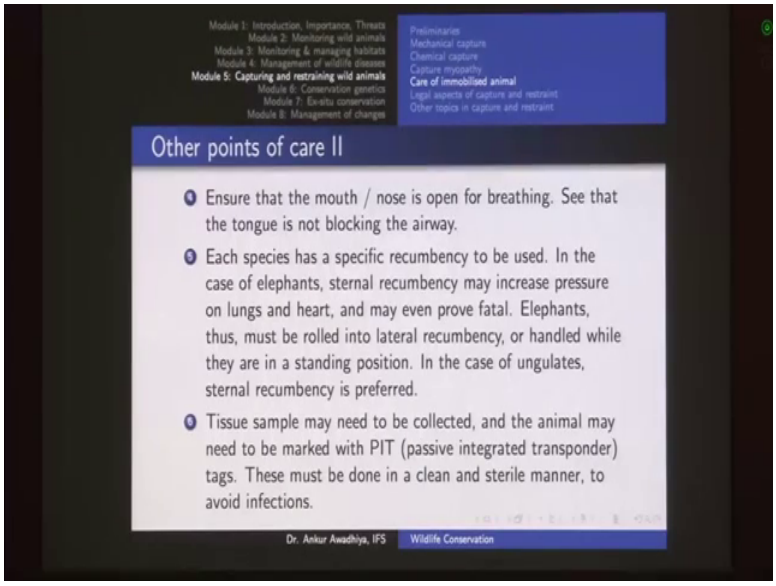

Then ensure that the mouth or the noise is kept open for breathing then each species has a specific recumbency to be used. So, in the case of elephants you should not put those animals into the sternal recumbency, but you should always put them in to a lateral recumbency or you should work with the animals when they are standing.

But on the case of other ungulates in the case of ungulates such as deer you should go for a sternal recumbency. Now, when you are taking out tissue samples then or when you are taking out blood or when you are marking the animal with a pit tag, it has to be done in a sterile manner, so that there is no infection.

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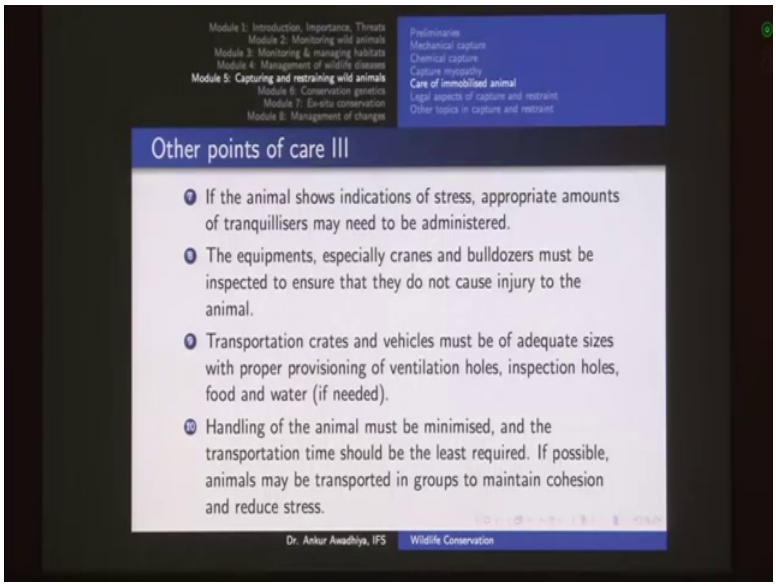

Now, if the animal shows any indications of stress then appropriate amounts of tranquilizers will have to be administered. The equipments must be must be inspected that they do not have any sharp corners and they do not cause any injury to the animal. Transportation crates and vehicles to have to be of adequate size and with proper provisioning of ventilation hole, inspection holes, food and water if required.

Handling of the animal needs to be minimized transportation time should be as less as possible. And if possible the animal should be translocated in a group to maintain cohesion to reduce stress and to avoid capture myopathy.

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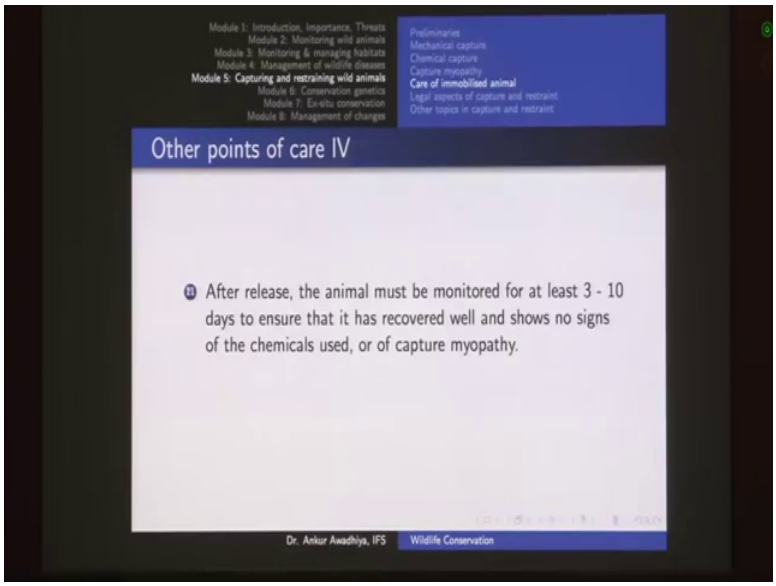

And after release also the animal needs to be a monitored for at least 3 to 10 days to ensure that it is a recovered well and does not show any signs of the chemicals that were used or any signs of capture myopathy. So, let us stop here. So, these are things that we covered in modules 3, 4 and 5. And we will begin with the legal aspects of capture and restraint tomorrow. So, that is all for today.

Thank you for your attention. [FL].