DNA Research
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[Animated ROM logo appears with sound sting]

[Oliver is standing in the DNA lab at the Royal Ontario Museum with bird bones and eggs displayed in front of him on the lab table]
One of the additions they have made to doing research at the Royal Ontario Museum started in the 1970s and very much in the 1980s was to actually add some molecular labs that can help us to actually study how animals are related to each other using other things rather than morphological characters such as, you know, plumage characteristics or bones. We can actually look at the DNA of different animals and actually be able to compare how they are related to each other; whether you are studying rare and endangered species, or basically to work out how distant animals are related to each other.

[Oliver points to the DNA thermal cycler, a white machine on the counter behind him]
Now, the heart of actually doing a lot of the DNA work we do now is this particular machine we have over here: It is called a DNA thermal cycler. What it actually does is it actually replicates DNA for us. So we can actually start off with a piece of DNA, and the DNA can be either from a blood sample or from a hair sample or, perhaps, the DNA can actually come from a bone that could be several thousand years old. And this machine, will, in a couple of hours, replicate millions of copies of that particular gene that you want to amplify. And once you actually have amplified that gene, you can then actually sequence the DNA, using a DNA thermal cyclar.

[Cut-away to Oliver sitting in front of the computer demonstrating the process, and then back to Oliver in front of the lab table]
What it does is it will actually read the DNA sequences and will allow us then to compare those DNA sequences for the different animals.

[Oliver picks up a mount of a salmon]
Now, to give you an idea of one particular project that we are involved in: This is a mount from 1882. This is an Atlantic salmon taken from Lake Ontario. In fact, it's been reported on that Lake Ontario was one of the greatest fresh water salmon lakes in the world when settlers, European settlers, arrived here in the 17 and 1800s. *[close-up of salmon mount]* But, the polluting of the lake and the damming of the rivers wiped out the populations by about 1900. And now, ever since then, the Ministry of Natural Resources in Canada, as well as the Department of Fisheries and Oceans in the United States, have been trying to bring back salmon stocks in Lake Ontario. *[return to full view of Oliver holding salmon mount]* And one thing they have been doing is capturing more Atlantic salmon from some place like in Nova Scotia, and using those fish to restock the lake. So far, it hasn't been all that successful. So what we're doing actually here in the DNA lab is that the Museum has six mounts taken from the 1800s. And we've actually succeeded in recovering DNA from these particular mounts and are now using those DNA patterns to find out if any of the fish that are descended from Lake Ontario still exist. Because, prior to

them going extinct, eggs were actually taken around and used to stock other lakes and rivers. Our logic being here, that the fish that they are currently using may not be the best suited – being used to a salt-water condition – the ones that will be in Lake Ontario will be trapped in fresh water, and the ones that were here had been in fresh water for a very long time so they had adapted to it. So, we are actually using DNA fingerprints from the salmon to hopefully find the original stocks and use them to re-stock Lake Ontario.

[Video ends with animated ROM logo and sound sting]