

WILD HOPE

Birds on the Brink

	TIME CODE	VIDEO	AUDIO
1	01:00:00:00		CHRISTA SEIDL: There were once over 50 species of honeycreepers only found in Hawaii. They were seed dispersers, pollinators, predators of many of our native invertebrates. We now only have 17 species. If we lose honeycreepers, we lose the balance of our Hawaiian ecosystems.
2	01:00:24:17		VO: WITH TWO-THIRDS OF HAWAI'I'S NATIVE HONEYCREEPERS ALREADY EXTINCT, SCIENTISTS ARE TAKING EXTRAORDINARY STEPS TO SAVE THE FEW THAT ARE LEFT.
3	01:00:36:21		CHRISTA SEIDL: People from all over the world have come together in order to save our species. But we need to act now.
4	00:00:47:20	TITLE: WILD HOPE BIRDS ON THE BRINK	
5	00:00:59:03	LOWER THIRD: Christa Seidl, Ecologist	CHRISTA SEIDL: I was so inspired when I first came to Hawaii to work on Hawaiian honeycreepers.
6	01:01:06:08		VO: ELEVEN YEARS AGO, CHRISTA SEIDL STUDIED HONEYCREEPERS AS AN INTERN WITH THE MAUI FOREST BIRD RECOVERY PROJECT. WHEN SHE LEFT FOR HER PHD IN DISEASE ECOLOGY, SHE KNEW SHE'D RETURN.
7	01:01:22:11		CHRISTA SEIDL: I thought one day I'll come back and I'm going to be a coordinator for that project. Here I am.

8	01:01:33:07		<p>VO: LIKE DARWIN'S FINCHES IN THE GALÁPAGOS, HONEYCREEPERS ARE A FAMED EXAMPLE OF HOW ONE SPECIES CAN MULTIPLY INTO MANY.</p> <p>6 TO 7 MILLION YEARS AGO, A SINGLE ROSEFINCH SPECIES ARRIVED ON THE HAWAIIAN ISLANDS, LIKELY AS A FLOCK BLOWN IN FROM ASIA BY A STORM.</p> <p>OVER SEVERAL MILLION YEARS AND AS NEW ISLANDS FORMED, HONEYCREEPERS SPREAD ACROSS THE ARCHIPELAGO. THEY EVOLVED INTO MANY DIFFERENT SPECIES WITH UNIQUE COLORATIONS, BEAK SHAPES AND FORAGING PATTERNS. THESE ADAPTATIONS ALLOWED THEM TO TAKE ADVANTAGE OF OPEN HABITATS.</p>
9	01:02:20:16		<p>VO: BUT THE SAME ISOLATION THAT ALLOWS ISLAND SPECIES TO DIVERSIFY, ALSO LEAVES THEM VULNERABLE TO THREATS FROM AFAR.</p>
10	01:02:32:02		<p>VO: THE FIRST WAVE OF EXTINCTIONS BEGAN AFTER POLYNESIANS ARRIVED AROUND A THOUSAND YEARS AGO. THE RATS, PIGS AND DOGS THEY BROUGHT WITH THEM STARTED THE DECLINE.</p>
11	01:02:47:10		<p>CHRISTA SEIDL: It accelerated with the arrival of Europeans who brought many more invasive animals with them.</p>
12	01:02:56:08		<p>VO: THE HONEYCREEPERS HAD EVOLVED NO DEFENSES AGAINST THESE PREDATORS,</p> <p>AND WHEN MONGOUSES WERE LATER INTRODUCED TO KEEP THE RATS IN CHECK, THEY ALSO BEGAN EATING THE BIRDS, EGGS AND NESTLINGS.</p> <p>INVASIVE PLANTS TOOK THEIR TOLL TOO, OUTCOMPETING THE NATIVE SPECIES THAT THE HONEYCREEPERS DEPENDED ON.</p>

			<p>AND THEN, THERE WAS HUMAN DEVELOPMENT, WHICH CONTINUALLY ENCROACHED ON THE BIRDS' HABITAT.</p> <p>IT WAS A DEVASTATING MIX OF THREATS. TODAY, SOME OF THE REMAINING SPECIES HAVE FEWER THAN 200 INDIVIDUALS LEFT.</p>
13	01:03:44:21		<p>CHRISTA SEIDL: We felt like each one of us would eventually come to know a bird that went extinct.</p>
14	01:03:53:18		<p>VO: UNWILLING TO SIMPLY ACCEPT SUCH A LOSS, CHRISTA AND HER COLLEAGUES ACROSS HAWAI'I WENT TO WORK.</p>
15	01:04:02:22 01:04:03:20	<p>LOWER THIRD: LAURA NAVARRETE Field Technician</p>	<p>LAURA NAVARRETE: So this one's active and we can move onto the next trap.</p>
16	01:04:06:04		<p>VO: THEY BEGAN BATTLING THE INVASIVE PREDATORS.</p> <p>...AND RESTORING NATIVE TREES TO THE FORESTS.</p>
17	01:04:15:15 01:04:16:03	<p>LOWER THIRD: Laura Berthold, Ornithologist</p>	<p>LAURA BERTHOLD: We planted nearly a quarter of a million trees over 16 different native plant species.</p>
18	01:04:26:04		<p>VO: IN SPOTS, THEIR EFFORTS SEEMED TO BE WORKING.</p> <p>HERE IN NAKULA NATURAL AREA RESERVE ON MAUI, THE TWO MOST ABUNDANT HONEYCREEPER SPECIES, THE 'APAPANE AND THE HAWAI'I 'AMAKIHI, WERE FLOURISHING.</p>

19	01:04:44:16		<p>CHRISTA SEIDL: The forest grew back so well that by 2019 we thought it was ready to have one of our rarest species of birds, the kiwikiu, reintroduced to it.</p> <p>There are less than 150 individuals. We wanted to reintroduce them to Nakula because we know from the fossil record they once occurred all across Maui.</p>
20	01:05:14:01		<p>VO: WHAT THEY DIDN'T KNOW WAS THAT THE FOREST ALSO HID A DEVASTATING DISEASE.</p>
21	01:05:22:09		<p>LAURA BERTHOLD: It was exciting at first because we had released these birds into this area that we had worked so hard to restore. But unfortunately, in less than a month, the birds started dying and we found out that it was from avian malaria.</p>
22	01:05:43:22		<p>VO: AVIAN MALARIA IS A PARASITE CARRIED BY MOSQUITOES. IT'S BEEN AROUND FOR MILLIONS OF YEARS, BUT ONLY REACHED HAWAI'I IN THE MID-20TH CENTURY.</p> <p>WITH SUCH LOW NUMBERS AND NO NATURAL RESISTANCE TO THE DISEASE, THE REINTRODUCED KIWIKIUS QUICKLY SUCCUMBED.</p> <p>THE DEATHS WERE A DIRE WAKE-UP CALL. AVIAN MALARIA HAD BECOME THE BIGGEST THREAT TO HONEYCREEPER POPULATIONS.</p>
23	01:06:20:16		<p>CHRISTA SEIDL: Avian malaria kills our honeycreepers very quickly, often within a matter of weeks. So they don't have enough time to reproduce and create the next generation.</p>

24	01:06:34:21		<p>VO: SINCE MOSQUITOES ARE THE PRIMARY VECTOR FOR THE SPREAD OF AVIAN MALARIA, PREVENTING THE DISEASE SHOULD START WITH THEM.</p> <p>BUT THE CLOCK IS TICKING. RISING TEMPERATURES ARE ALLOWING THE MOSQUITOES TO MOVE HIGHER UP THE MOUNTAIN SLOPES AND INTO NEW BIRD HABITATS.</p> <p>UNLESS THAT SPREAD CAN BE STOPPED, THE REMAINING SPECIES OF HONEYCREEPERS WILL HAVE LITTLE CHANCE OF SURVIVAL.</p> <p>THINKING CREATIVELY, THE TEAM ZEROED IN ON AN APPROACH PREVIOUSLY USED TO PREVENT MOSQUITO-BORNE DISEASES IN HUMANS.</p>
25	01:07:21:11		<p>CHRISTA SEIDL: So in order to address the issue of avian malaria, we really need to suppress the mosquito populations that will transmit it onto our native birds by using a control technique that takes advantage of a unique biological interaction.</p>
26	01:07:38:14		<p>VO: MOST MOSQUITOES THAT CARRY AVIAN MALARIA NATURALLY HAVE A BACTERIUM CALLED WOLBACHIA IN THEIR GUT. BUT WHEN A FEMALE MATES WITH A MALE THAT HAS A DIFFERENT STRAIN OF WOLBACHIA, THE EGGS FROM THAT UNION SIMPLY WON'T HATCH.</p>
27	01:07:55:12		<p>CHRISTA SEIDL: We're taking advantage of this interaction to release male mosquitoes with a bacteria type that does not occur here in Hawaii.</p>
28	01:08:06:00		<p>VO: BY BRINGING IN INCOMPATIBLE MALES, WHICH DO NOT BITE AND CANNOT SPREAD DISEASE, THEY'RE EFFECTIVELY INTRODUCING BIRTH CONTROL FOR THE HAWAI'IAN MOSQUITO POPULATION.</p>

29	01:08:20:15		<p>VO: THIS TECHNIQUE HAS BEEN SUCCESSFULLY IMPLEMENTED IN MORE THAN 12 COUNTRIES TO REDUCE MOSQUITO POPULATIONS AND THE SPREAD OF DISEASE.</p>
30	01:08:32:09		<p>CHRISTA SEIDL: Because we've seen such success in using this technology to reduce human diseases, we're building on all of that knowledge and experience used all around the world to inform the control that we're going to use here in Hawaii.</p> <p>Okay, are we good to go? Awesome.</p>
31	01:08:51:21		<p>CHRISTA SEIDL: We are at the precipice of having a tool to address avian disease. All of the work we're doing has really invigorated us and given us a type of hope that we haven't had in decades.</p>
32	01:09:08:23		<p>VO: TIME WILL TELL, BUT IF THIS TOOL WORKS, IT COULD BE THE DIFFERENCE BETWEEN SURVIVAL AND EXTINCTION FOR HAWAI'I'S REMARKABLE HONEYCREEPERS.</p>