

## WILD HOPE Season 2 CORAL COMEBACK

0.	TIME CODE	VIDEO	AUDIO
1.	<b>01:00:01:10</b>		<p><b>KIRA:</b></p> <p>In our lab we do two different ways of approaching coral restoration. One is selective breeding.</p> <p>You first have to identify which parents are thermally tolerant. And we bring those into the lab and expose those to heat stress.</p>
2.	<b>01:00:16:10</b>		<p><b>MADIEINE:</b></p> <p>And we can assess a coral's resilience under that stress test.</p> <p>We're seeking out these resilient corals so that we have insurance in the reefs.</p>
3.	<b>01:00:25:20</b>		<p><b>NARRATOR:</b></p> <p><b>INSURANCE AGAINST THE DEVASTATING EFFECT OF CLIMATE CHANGE WHICH IS WARMING OUR OCEANS AND KILLING OFF CORALS WORLDWIDE.</b></p>
4.	<b>01:00:34:20</b>		<p><b>KIRA:</b></p> <p>If we prepare the reefs now for the future, then they have a better chance at surviving.</p>
5.		<p><b>GRAPHIC:</b> Wild Hope Coral Comeback</p>	<p><b>ACT 1</b></p>
6.	<b>01:00:46:10</b>	<p><b>GRAPHIC L3rd:</b> <b>Kira Hughes</b> <b>Marine Biologist</b></p>	<p><b>KIRA:</b></p> <p>I definitely have a personal relationship with coral. I grew up with it. Where we live in Hawaii, it protects our coastlines.</p> <p>When I was younger, I used to snorkel at a spot called Hanauma Bay. The fish would just come up to you and there was just these amazing corals. It was very different back then than it is now.</p>

7.	01:01:06:04		<p><b>KIRA:</b> The first bleaching event in Hawaii that people noticed was about 1996. And then, in 2014 and 2015 we had back-to-back bleaching events and that's when corals got really, really stressed.</p>
8.	01:01:19:14		<p><b>NARRATOR:</b> <b>YEAR AFTER YEAR OCEAN TEMPERATURES ARE RISING, AND TRIGGERING A DEADLY PHENOMENON KNOWN AS CORAL BLEACHING.</b> <b>IT'S A MAIN REASON WHY HALF OF ALL CORAL REEFS WORLDWIDE HAVE DIED SINCE THE 1950s.</b></p>
9.	01:01:37:20	<p><b>MAP GRAPHIC:</b> Oahu Lab location</p>	<p><b>NARRATOR:</b> <b>KIRA HUGHES AND HER TEAM ARE TRYING TO REVERSE THAT TREND.</b> <b>WORKING OUT OF THE CORAL RESILIENCE LAB AT THE UNIVERSITY OF HAWAII IN OAHU.</b></p>
10.	01:01:48:15		<p><b>KIRA:</b> We haven't just been looking at the threat to the corals, but we've also been looking at how they can recover.</p>
11.	01:01:58:00		<p><b>NARRATOR:</b> <b>CORALS ARE SMALL ANIMALS, SOFT-BODIED POLYPS THAT ATTACH THEMSELVES TO UNDERWATER SURFACES.</b> <b>MANY CREATE STONY SKELETONS AROUND THEIR BODIES, WHICH ACCUMULATE OVER TIME TO FORM COLONIES THAT MAKE UP REEFS.</b> <b>OVER 25% OF ALL MARINE LIFE DEPENDS ON CORALS HABITAT FOR PROTECTION OR AS A SOURCE OF FOOD.</b></p>
12.	01:02:25:15		<p><b>KIRA:</b> Coral is a foundation species that all of the other animals and plants and algae build from. Without coral, you lose a whole ecosystem.</p>

13.	01:02:38:00		<p><b>NARRATOR:</b></p> <p><b>THE CURRENT DANGER TO CORALS COMES FROM THEIR SYMBIOTIC RELATIONSHIP WITH PHOTOSYNTHETIC ALGAE THAT LIVE INSIDE THEIR CELLS.</b></p>
14.	01:02:47:07		<p><b>KIRA:</b></p> <p>Typically, the algae gives the coral sugars to feed it over 90% of its food. And then the animal, the coral, gives back its waste and the algae takes that up.</p>
15.	01:02:59:15	<p><b>GRAPHIC:</b> Bleaching animation</p>	<p><b>NARRATOR:</b></p> <p><b>WHEN SUDDEN, MARINE HEAT WAVES ENGULF CORAL, THE ALGAE PRODUCE CORROSIVE CHEMICALS THAT DAMAGE THE CORALS CELLS. THE ALGAE THEN LEAVE THE CELLS AND THE CORAL LOSES ITS COLOR.</b></p>
16.	01:03:17:00		<p><b>KIRA:</b></p> <p>When the algae releases outside of the coral, the coral no longer has that source of food.</p>
17.	01:03:26:05		<p><b>NARRATOR:</b></p> <p><b>MOST STARVING CORALS WILL DIE WITHIN A FEW WEEKS, IF THEY CAN'T REACQUIRE ALGAE.</b></p> <p><b>BUT AGAINST THE ODDS, <i>SOME</i> CORALS SURVIVE THESE BLEACHING EVENTS.</b></p> <p><b>THESE SURVIVORS ARE THE FOCUS OF KIRA AND HER TEAM'S WORK.</b></p>
18.			<p><b>ACT 2</b></p>
19.	01:03:41:05		<p><b>KIRA:</b></p> <p>In our lab we do two different ways of approaching coral restoration. One is selective breeding.</p>

20.	<b>01:03:49:00</b>		<p><b>NARRATION:</b></p> <p><b>THE GOAL IS TO BREED CERTAIN CORALS WITH EACHOTHER TO INCREASE THEIR TOLERANCE TO HEAT.</b></p> <p><b>THE WORK STARTS IN THE OCEAN WHERE THE BIOLOGISTS WAIT FOR CORALS THAT SURVIVE BLEACHING EVENTS TO SPAWN.</b></p>
21.	<b>01:04:03:20</b>		<p><b>KIRA:</b></p> <p>You first have to identify which parents are thermally tolerant and you can do that by tagging them during a bleaching event. We deem the ones that don't bleach as thermally tolerant.</p> <p>We go out at night when they're spawning, and we can pick up those egg sperm bundles. And we bring those into the lab and expose those to heat stress.</p>
22.	<b>01:04:25:05</b>	<p><b>GRAPHIC L3rd:</b>  <b>Madeleine Sherman</b>  <b>Marine Biologist</b></p>	<p><b>MADELEINE:</b></p> <p>Each tank is controlled by a computer. And we can program it to be whatever temperature we want it. We ramp the temperature up and then we bring it back down and we can assess a coral's resilience under that stress test.</p> <p>Corals in Hawaii will readily bleach at around 28 degrees Celsius.</p>
23.	<b>01:04:45:05</b>		<p><b>NARRATOR:</b></p> <p><b>THAT'S ABOUT 82 DEGREES FAHRENHEIT.</b></p> <p><b>BUT SOME TANKS PUSH THE CORALS EVEN FURTHER, WARMING TO TEMPERATURES THAT OFFSHORE WATERS ARE PREDICTED TO REACH IN THE YEARS AHEAD, AS HIGH AS 90 DEGREES FAHRENHEIT OR 32 DEGREES CELSIUS.</b></p>

24.	01:05:03:15		<p><b>MADELEINE:</b></p> <p>We have a tank, which has temperatures that's predicted to happen in 2095, so we can even see how the corals are gonna do in about 70 years from now.</p>
25.	01:05:15:00		<p><b>NARRATOR:</b></p> <p><b>THE CORALS THAT HANDLE THE HEAT BEST ARE SELECTED FOR BREEDING. BECOMING PARENTS TO THE NEXT GENERATION.</b></p> <p><b>IT TAKES FIVE YEARS, AND LOTS OF CARE, FOR THEM TO MATURE TO BREEDING AGE.</b></p>
26.	01:05:27:23		<p><b>KIRA:</b></p> <p>We feel like we're their parents, you know, and now we're their grandparents. So, we get really connected to these corals. We watch them grow and we nurture them.</p>
27.	01:05:36:20		<p><b>NARRATOR:</b></p> <p><b>THE HOPE IS THAT EACH SUCCESSIVE SELECTIVELY BRED GENERATION WILL BECOME MORE RESILIENT TO HEAT STRESS.</b></p>
28.	01:05:44:07		<p><b>KIRA:</b></p> <p>When you can increase that trait and enhance that heat tolerance over time in the genes, that's where you're gonna see the greatest difference that can make an impact on heat tolerance of the reef overall.</p>
29.	01:05:58:00		<p><b>NARRATOR:</b></p> <p><b>THE PROCESS TAKES TIME AND MANY GENERATIONS. SO, THE TEAM TAKES A SECOND TRACK TO ACCELERATE THEIR IMPACT.</b></p>

30.			<b>ACT 3</b>
31.	<b>01:06:10:20</b>		<b>KIRA:</b> One of the big issues with coral restoration is scaling up. So, we decided to invite community members from every island, to join together in these efforts so that we can make a big enough impact.
32.	<b>01:06:24:10</b>		<b>NARRATOR:</b> <b>LOCALS GATHER TO HELP THE LAB MAKE USE OF ANOTHER SOURCE OF HEAT RESISTANT CORALS.</b>
33.	<b>01:06:31:05</b>		<b>NARRATOR:</b> <b>THE TEAM COLLECTS LARGE FRAGMENTS OF WILD CORAL THAT BREAK OFF IN THE OCEAN, THEY'RE CALLED "CORALS OF OPPORTUNITY".</b>
34.	<b>01:06:42:10</b>	<b>GRAPHIC L3rd: Alika Garcia Volunteer Diver</b>	<b>ALIKA:</b> Today we're in Maunalua Bay, Oahu, and we're gonna be collecting corals of opportunity from a sea table at about 35 feet of water.
35.	<b>01:06:53:10</b>		<b>KIRA:</b> Corals of opportunity are corals that broke off from like a turtle coming by and nestling in the reef or a fish swinging its tail and knocking off one of the corals. And we use that material because that way we're not taking pieces from the healthy and intact reef.
36.	<b>01:07:09:20</b>		<b>NARRATOR:</b> <b>KIRA'S TEAM WILL TEST THESE PIECES FOR HEAT TOLERANCE BEFORE THEY PLANT THEM BACK ON THE REEF.</b> <b>IT'S A BIG JOB AND REQUIRES A LOT OF LOCAL SUPPORT.</b>

37.	<b>01:07:21:15</b>		<p><b>KIRA:</b></p> <p>We have our core team members that dive down and they grab those corals of opportunity and bring them to the surface. And then we have paddlers from Hui Nalu Canoe Club and they go out and they bring in the corals in these big tubs. And then we collect them from them.</p>
38.	<b>01:07:38:13</b>		<p><b>MADELEINE:</b></p> <p>So today we've invited members from the community to come help us fragment our corals, to be stress tested.</p> <p>We're taking these from the nursery table that's out in the bay.</p> <p>Volunteers will, take a photo of the coral, they will identify the species of the coral and assess the health of the coral.</p>
39.	<b>01:07:59:15</b>		<p><b>NARRATOR:</b></p> <p><b>SMALL PIECES ARE CUT OFF EACH CORAL AND BONDED TO A PLUG.</b></p> <p><b>THE TEAM CAN THEN SAFELY TRANSPORT THEM TO THE THE LAB FOR TESTING, TO SEE WHICH ONES ARE THE MOST HEAT-TOLERANT.</b></p>
40.	<b>01:08:10:20</b>		<p><b>KIRA:</b></p> <p>We put those through about a three weeklong stress test.</p> <p>The ones that don't bleach at all or take a while to bleach, those will be the ones that we prepare to be out planted back on the reef.</p>
41.	<b>01:08:26:00</b>		<p><b>NARRATOR:</b></p> <p><b>TODAY THESE NATURALLY RESILIENT CORALS OF OPPORTUNITY AREN'T THE ONLY ONES HEADING BACK OUT TO THE REEF.</b></p> <p><b>FOR THE FIRST TIME, JUVENILES BRED IN THE LAB, THE NEXT</b></p>

			<b>GENERATION OF HEAT RESISTANT CORALS, ARE JOINING THEM.</b>
42.	<b>01:08:42:00</b>		<b>KIRA:</b> What's really exciting this year, we're actually gonna outplant selectively bred corals for the very first time.  With known thermally tolerant corals in the reef, they can make those reefs more resilient. And that's our hope.
43.	<b>01:08:59:04</b>	<b>GRAPHIC L3rd: Hanalei Ho'opai- Sylva Marine Biologist</b>	<b>HANALEI:</b> I think any restoration and trying to bring corals back is super important.  I got an underwater drill and basically we will use this to drill hole that could fit our coral plugs in there.
44.	<b>01:09:09:00</b>		<b>KIRA:</b> I'm adding on the tip for the glue. It's a two-part epoxy. So, we can stick the coral in there and it'll stay solid.
45.	<b>01:09:21:15</b>		<b>KIRA:</b> We'll see if they can actually withstand this temperature stress that's coming.
46.	<b>01:09:27:11</b>		<b>NARRATOR.</b> <b>SUCCESS WON'T SOLVE THE CLIMATE CRISIS, BUT FOR CORALS IT COULD BE A CRITICAL LIFELINE AS OCEAN TEMPERATURES RISE.</b>
47.	<b>01:09:38:00</b>		<b>KIRA:</b> What we've learned so far is that thermal tolerance is definitely a trait that can be inherited and that's really exciting because that shows how we can continue to improve thermal tolerance over time.
48.	<b>01:09:50:00</b>		<b>KIRA:</b> We are gonna keep doing what we can to keep up with climate change and try to



			provide the best future for these corals that we can.
49.	<b>TRT: 01:10:46:19</b>		<b>OUT</b>