

— SOUNDS —
WILD



BEN MIRIN



"There is a natural harmony in the way sound works in the animal and human worlds."

BIO

Ben Mirin is a sound artist, acoustic biologist, and explorer. As a lifelong naturalist and musician, Ben combines his two passions to capture untold stories about nature through sound. His work has earned him world-renowned grants and awards from places like the Explorers Club, Safina Center, and the Chicago Art Institute - to name a few. He is an author, an educator, and now, he leads expeditions around the world recording animal sounds to advance scientific research, and samples their voices to unlock secrets which can change what we know about the future of life on earth.

POC: "SOUND THERAPY"

Location: Hawaii

MISSION: Healing injured species through the power of sound.

In Hawaii, the extinction capital of the world, massive efforts are underway to rehabilitate injured and orphaned seabirds. The Hawaiian Wildlife Center is the only native bird rescue center in all of Hawaii's islands, and every day is a mission to save and nurse these endangered birds back to health.

Stress is a major enemy of these beautiful wild birds' rehabilitation, as the stress of being in a foreign environment slows down healing. Lead scientists are eager for a way to relax the birds while they await release back into the wild, knowing how imperative this is to their progress.

The team at HWC has heard about Ben's work in acoustics and has invited him to visit their center. They believe that Ben may hold the keys to an unprecedented technique - using sound as a tool to relax the birds and remind them of home. By collecting the sounds of their native habitat and creating a custom soundscape for playback at the center, Ben will see if the power of sound can revolutionize the care of wild birds - bringing them one step closer to healing and release.

SOUND THERAPY - SIX ACT BREAKDOWN

ACT ONE

- Cold Open to establish series concept and overview.
- Establishing mission in Hawaii and intro the The Hawaii Wildlife Center - the only rescue center for native wildlife on the entire island of Hawaii.
- Establishing the center's need to make the birds feel more relaxed while in their care - and need for more sophisticated sound equipment to enhance their feeling of home.
- Ben meets the patients in their care, learns about their behavior, and decides what sounds will be needed in the field. Ben will head out to the edge of Oahu, where the most seabirds are found, to record the pieces to a custom soundscape for the Wildlife Center's bird rehabilitation efforts.
- Ben embarks on his mission. Act out.
- EPISODE SUPERTEASE.



ACT TWO

- Ben arrives on location to meet the local expert who can guide him directly to the seabirds.
- He sees the birds in the distance, but they have migrated over to the far part of the cliff, making it nearly impossible to reach their sound.
- Ben came to this place specifically to capture the seabird sounds, and if he can't get close, accurate takes of the birds, it may disrupt the whole mission.
- He surveys his equipment and attempts to conjure a plan. How will he get to the birds?
- Act out.

ACT THREE

- The challenge is overcome as Ben treks down the cliff and is able to get within a few meters of the birds, who are moving in his direction.
- He gets up close and personal with the albatross, recording their incredibly complex noises in crisp, clean takes. He also gathers sounds of the ocean, wind, and birds flying overhead.
- Enthusiastic about his takes, Ben culls the sounds together in a custom mix and heads back to the wildlife center.
- He sets up speakers, anticipation builds, and he presses play. Will it work?
- Act out.

ACT FOUR

- Huge payoff, at the sound of Ben's mix the birds are active, curious, walking about, and flapping their wings. The wildlife center is incredibly pleased and plans to use these sounds for years to come as their therapy evolves.
- Map graphic - Ben sets off for Maui. It's turtle hatching season and he's always wanted to witness this incredible moment in nature. He's heard that there is ongoing research about turtle eggs communicating amongst each other in the nest, and he wants to find out more.
- Ben meets local expert who affirms they believe that the turtles use sound to coordinate their hatch - giving them the best chance of survival.
- It's late in the season - and most of the nests have already hatched. Can they find an active site before it's too late? They walk the beach looking, but don't see any nests in the places where they should be found. Ben's opportunity may be missed.
- Act out.

ACT FIVE

- In a corner of the beach where eggs are not typically laid, Ben stumbles across an active nest that's just days, maybe hours, away from hatching.
- They quickly realize this has become a dangerous place for the turtle nest.
- With all nearby nests already hatched, predators are looming in every direction, waiting to devour the turtles as soon as they attempt their sprint to the ocean.
- This poor nesting site has Ben nervous – the success of this nest trumps his desire to record sound. How can he and the local expert make sure these hatchlings make it safely to the ocean?
- Do they step in to save the turtles from perish?
- Act Out.

ACT SIX

- Ben and the local expert devise a plan to implement Hawaii sanctioned soft fencing around the turtle nest – building it together, they affirm this fend less species' chance for survival.
- With the fence in place, Ben feels it's safe enough to place the microphones, and plants them in the sand as the nest buzzes with looming release, capturing these intricate coordinated vocalizations for the first time.
- Ben delights at the turtle egg sounds, as no one has ever captured their communication so crisply in the safety of a protected nest. He's recorded groundbreaking audio AND protected this nest from predators. Not bad for a day's work in Maui.
- WHERE ARE THEY NOW text on screen – flash to the Hawaii Wildlife Center where ongoing sound therapy efforts are helping birds every single day to heal faster and get back out into the wild.
- Ben describes this incredible feeling of making a real impact during his time in Hawaii.
- WHERE ARE THEY NOW text on screen – Flash to the sea turtle rescue program, who are using Ben's recordings to continue to learn more and more about these fragile creatures in the imperative moments before they rush to the ocean.
- Wrap up from Ben, birds releasing, turtles rushing to the sea, big music cue.
- End.



HOWL

Location: Palenque National Park, Mexico

MISSION: Using acoustic clues to debunk animal myths.

Black Howler Monkeys are the loudest land mammal on earth- and can be heard up to 3 miles away. To get an extra leg up, the monkeys have been observed using their hands to amplify their call. It makes their voices deeper, which is important for establishing status in competition with other monkeys. Scientists believe this is a culturally transmitted behavior, as opposed to genetic- which means they learned it over time, or perhaps – learned it from humans.

By observing these Monkeys in a controlled environment and comparing their calls to those in the wild, can Ben tackle this suggested theory? Some, debate that primates evolved ways to make their voices more flexible (acoustic plasticity) long before we humans evolved, while others credit humans for this impactful learned behavior. Can sound unlock the truth?

HOWL - SIX ACT BREAKDOWN

ACT ONE

- Cold Open to establish series concept and overview.
- Establishing mission in Mexico and establishing the ancient mysticism of Palenque national park – a sacred place that is inhabited by animals but frequented by tourists.
- The howler monkeys have made their home here – throughout the tree canopies and occasionally in and around the ancient ruins, where they exhibit humanlike behavior by using their hands to amplify their calls.
- Ben learns that these Mexican Howler Monkeys are the loudest creatures in the world, with deep rooted presence in this area of Mexico, and in meeting lead scientists for the first time – they explain the research on howler monkeys and this unique learned behavior.
- Ben will head out to the remote edge Mexico's jungle where the howler monkeys are unaffected by human influence, though consequently extremely hard to locate and observe high up in the canopies – can he find these wild primates in the treetops?
- Ben embarks on his mission. Act out.
- EPISODE SUPERTEASE.



ACT TWO

- Ben arrives in the remote Mexican jungle where the howler monkeys make their nests and with his equipment and is met by a local guide who knows the forests where they are planning to trek.
- The monkeys are spotted, but they are a short distance away and move quickly. Pacing to keep up with them, Ben strategizes how he will record the sounds.
- Because they live high up in the trees to avoid predators, Ben will need to climb into the canopy to reach them. At a local lookout structure, where it's safe, Ben ascends nervously with his equipment strapped to his back.
- He disappears into the trees.
- Act out.

ACT THREE

- Submitting into the clouds, Ben comes within meters of the Howler Monkeys, sunning and socializing amongst the pack.
- As they relax and take in the sun, Ben captures their incredible howling sound- observing these remarkable creatures as he does.
- He descends, thrilled to have captured such breathtaking recordings of this elusive monkey. Bringing the sounds back to the lab, the frequencies of the calls are dissected and compared with historical recordings. By comparing the frequencies, Ben may hold the keys to this myth.
- Did the monkeys learn to amplify their sounds with their hands from humans? Or are they so clever that they learned this long, long ago?
- Can sound unlock the truth?
- Act out.

ACT FOUR

- Big payoff and resolution. Ben helps inform the research that has been done on these monkeys for decades and his recordings are added to the library to be used for years to come.
- Pleased and invigorated, Ben heads back to Palenque's ruins to learn more about the incredible snake population slithering through these ancient structures.
- Most people assume that snakes either hiss or make no noise at all. While there, Ben meets up with Bruce Young – a Herpetology PHD who has dedicated his life to understanding snake behavior. Ben wants to bring sound to the table to help.
- Bruce meets Ben and explains that little is known about snake noises. A common misconception is that snakes are deaf, when in fact they are not- far from it, and some believe they hear even better than the average house cat.
- But where snake vocalizations are rare and often reserved for self-defense – can Ben gather enough data amidst the ancient ruins of Palenque to test snake hearing among these holy landmarks?
- Act out.

ACT FIVE

- Climbing over stone temples, through cavernous hallways, and into the belly of this holy place – Ben battles tight, dark spaces in the pursuit of these snake sounds.
- In the eerie bowels of Palenque, he and Bruce spot their subjects and Ben manages to record a shining, crisp take of the snakes resonating beautifully in the echo of the chamber. However, as it is pitch black, it is nearly impossible to see the visual behavior of the snakes as they make their sounds.
- Taking these recordings back into the lab, Ben compares his takes to the Bruce's studies- and the two develop a theory as to how the sounds are being generated by the snake but need to test in a controlled environment to be sure.
- Ben's playback of these recordings will agitate the snakes in captivity just enough to see if their behavior mimics the supposed theory.
- Will the snakes respond to the sound of their own kind? Ben presses play. Will it work?

ACT SIX

- In hearing the sounds of Ben's mix, the snakes are stirred up and immediately show signs of response. After several minutes, they vocalize.
- Ben and Bruce are ecstatic to have witnessed this breakthrough.
- Bruce reiterates that he can use Ben's recordings for ongoing research at Palenque in making the park safer for visitors and snakes alike. Ben heads home having made a profound impact in Mexico!
- WHERE ARE THEY NOW text on screen – flash to Palenque where ongoing sound research are helping scientists learn more about Mexico's Howler monkeys every single day.
- Ben describes this incredible feeling of scaling the trees to see these creatures up close and making an impact in their study.
- WHERE ARE THEY NOW text on screen – Flash to Bruce's lab, who is still using Ben's snake recording to continue debunking efforts and shatter misconceptions about these incredible species.
- Wrap up from Ben, monkeys climbing, snakes slithering happily along the ruins, big music cue.
- End.



ARTIC BLAST

Location: The Arctic

MISSION: Helping to alleviate the stress of emerging industry on the animal world through sound.

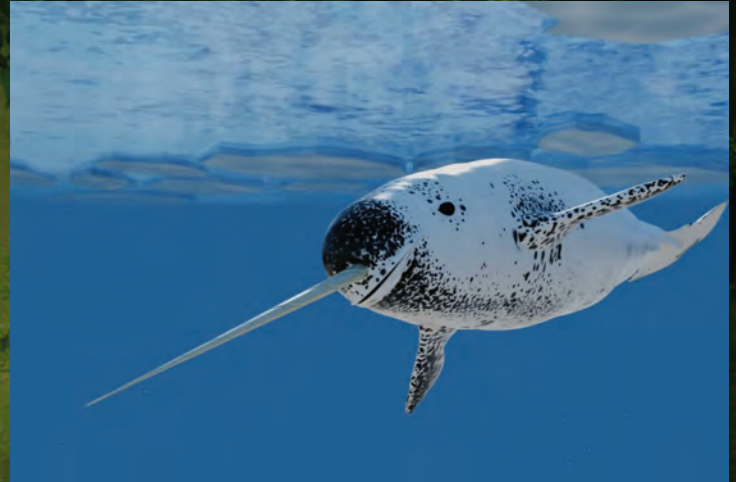
The Arctic is one of the most incredible and biodiverse landscapes on Earth. As conditions warm year over year, technological advances are making the Arctic more accessible to industry than ever before. Ships, seismic tests, blasting dynamic... But in the absence of daylight, many arctic dwellers like the iconic Narwhal use sound exclusively to navigate and find food. Evolution has fine-tuned these remarkable species to rely on sound as their primary defense and means of survival. As this precious ecosystem is subjected to increased commercial and human contact, how can wildlife respond?

Ben will head to the edge of the earth, the Arctic circle, uncover how these frozen dwellers adapt and survive using sound as their guide. When their habitat becomes dominated by the noise of ships, seismic tests, and other inventions that only came about in the last century - unlocking secrets unknown to scientists about their adaptation and resilience in these waters, their home. By shedding light on how sound damages these precious species, can Ben help to provide an alternative? Perhaps changing the way this methodology and new industry works and fine tuning the frequency of underwater tools can help alleviate stress on the Narwhals as they hunt and mate. By offering a solution - not shutting down industry but working effectively - sound study can help reduce stressful interference for these acoustic navigators.

ARCTIC BLAST - SIX ACT BREAKDOWN

ACT ONE

- The incredible arctic landscape, once covered in ice and snow, is now become a high traffic zone with shipping lands, construction, and industrialization. Models predict that there is a unique opportunity - right now - to plan for an increasingly accessible and rapidly diminishing chance to minimize risks for these fragile arctic species.
- Ben arrives in the arctic - fascinated, and alarmed, by how this industrial boom is affecting local wildlife whose evolution has made them accustomed to silence.
- He has never recorded in such a frozen land before - this will be a massive challenge even for Ben.
- Ben learns that for underwater creatures, like the Narwhal, the frequency of high powered machinery at work is blasting their eardrums - even if it is untraceable to human ears.
- If Ben can figure out the frequency at which the Narwhals vocalize and thereby hear - he can help urban developers take the first steps to decreasing harm for these majestic creatures.
- But recording underwater - and at these temperatures, will be the most challenging feat he has ever attempted. Can Ben deliver? Can the equipment hold up?



ACT TWO

- Ben arrives at the Northwest Passage - and observes the heavy ship traffic plaguing the arctic sea life in this area.
- He learns that the arctic seas are home to critical marine mammals found nowhere else on the planet - including Narwhals - who rely on sound and are determined by scientists to be the most vulnerable overall.
- Each year Narwhals repeat the same migratory pattern - so their movement through the northwest passage, and thereby noise exposure, is inevitable. Ben wants to use this rare opportunity to record their sound, record the sounds of the passing ships, and see if sound can help shed light on strategies to help.
- On the glacier's edge, battling winds and frozen temps, Ben plunges his equipment under the water's surface and instantly reacts as his headphones boom with the sound of underwater construction.
- He waits for the Narwhals - he's sure they will be passing through, but no sign of them yet. How long can he, and his equipment, withstand the frozen tundra?
- Act out.



ACT THREE

- As he battles through the wind, close to retreating – the Narwhals appear. Majestic as they glide through the passage in their pod formation.
- Ben delights as his underwater microphones capture their communication – though even for Ben the sound is muffled by the massive force of industry noise.
- He retreats to the lab- he's captured enough to get to work.
- Bringing the frequencies up on to his laptop – immediately, he sees where changes can be made.
- Ben makes plans to sit down with a local industry executive in the Passage and propose his ideas for frequency adjustment that has the potential to inflict much less damage on the Narwhal.
- Nervously, he enters the meeting room. Will the industry executive be receptive to his ideas in a landscape where money is everything?
- Act out.

ACT FOUR

- Ben demonstrates the frequency damage for the executive and quickly realizes that despite his booming arctic urbanization business- he is a big advocate for Arctic wildlife and excited for the chance to get Ben's take on his company's practices.
- He is shocked by the demonstration – Ben has touched him in a profound way. He is also encouraged by Ben's suggestions for fixes including timing, ship deviation techniques in the passage, and a change in the construction metals to emit sound at a much gentler frequency.
- This is a victory for Ben to have sparked the beginning of ongoing practice improvements in the arctic. They shake hands! A big day.
- Next on Ben's list while he's in the arctic are the beautiful, majestic polar bears. This time, he wants to get a sense of sounds above the ice and see if industrialization is equally damaging above board.
- Polar Bears are unique in that they rely on sound for mating, as they use it to locate their partner. As the industrial booms clutter the airwaves, they risk heading the wrong direction entirely for mating season – threatening this already fragile population.
- If Ben can capture the sounds of their mating grounds – it could unearth a new strategy to helping the bears find their way. But it won't be easy.
- Act out.

ACT FIVE

- Ben heads to the Polar Bear mating site and notices his surroundings- a large colony of seals combined with the groans of the bears fill the air.
- Ben realizes these are the sounds the bears are attempting to follow but are having a hard time hearing over the industrial blasts. He devises a plan to record the sounds of the mating ground and, through playback, help amplify the sound to help the bears find their way.
- A local guide leads him into the mating area – he sees the bears and attempts to set up his microphones but moving too slowly he is quickly chased back by a bear who notices their stake out.
- Discouraged, he retreats. He will have to move quicker and come up with a new way to record the sounds without disrupting the bears. But how?
- Act out.

ACT SIX

- Ben is reinvigorated – he realizes that his newest technology, a sound drone, would be the perfect instrument for this delicate mission.
- Ben deploys the drone which flies overhead of the bear colony, capturing sound as it circles above while the bears go happily about their business – blissfully unaware of Ben's recording devices and undisturbed.
- It's a victory! Ben retrieves the sound drone and collects his recordings – giving them to the local bear experts in the passageway region. Over the course of the season, Ben's sounds can be distributed by implanted loudspeakers near the cliffs edge which hovers over the nesting sites.
- WHERE ARE THEY NOW text on screen – flash to arctic industry executive who gives an update on how mechanics have changed based on Ben's influence and they are making strides every day to reduce their audible impact.
- WHERE ARE THEY NOW text on screen – Flash to cliff's edge where the local team are installing loudspeakers - potentially saving thousands of bears from wandering off in the wrong direction during mating season. They have every hope that it will continue to work beautifully.
- Wrap up from Ben, Narwhals swimming, polar bears roaring, big music cue.
- End.

“ACOUSTIC WARFARE”

Location: Panama

MISSION: By listening to audible hunting techniques in real time, we can unlock the secrets behind one of the world's most elusive predators.

Bats use ultrasonic calls to hunt Katydid – their number one meal source. Ultrasonic sounds cannot be heard by humans – but scientists have discovered that slowing down the calls can make them audible for study and research. Because this process of recording, ingesting, and slowing takes a long time – the context for these calls as they happen in the wild are often lost because scientists can't study these sounds as they are happening.

Could the use of Ben's new ultrasonic equipment allow us to slow the calls down in real time – as the bats are actively hunting, and learn the intricacies of their hunting methods? Using the stunning audiovisual opportunity of 4K and specialized equipment, might we too learn how the Katydid, conversely, modify their calling behaviors to escape detection? Ben will go into this incredible battlefield to collect data like never before.



“WORLD'S MOST DEADLY BIRDS”

Location: Daintree, Australia

MISSION: Can sound help us learn what makes the most lethal bird in the world tick?

Daintree National Park is the oldest rainforest on the planet, and the closest living counterpart to the ancient forests that once covered the earth's supercontinent, Pangea. The Cassowary is a large, flightless, and solitary bird who can only be found here – however unlike its social relatives of similar (emu and ostrich), the Cassowary do not cohabitate well. For them, territory is absolutely critical- and based on its history of brutal attacks many consider it to be the most dangerous bird in the world. These majestic creatures have a reputation for aggression, so getting close to learn about their behavior has been nearly impossible for scientists.

Trekking deep into this other world, Ben will plant specialized stationary equipment squarely in the heart of the rainforest before dawn. By doing this, he will capture the intricate symphony of this ancient forest – without the inevitable human impact that typically comes with observation. For an animal of this caliber, and whose preference for solitude could mean the difference between life and death, we can safely capture the vocalizations of the Cassowary who are most active at the break of day. Without causing or soliciting aggression, Ben may help scientists truly observe unaffected Cassowary behavior.



“SLOTH SPEAK”

Location: Costa Rica

MISSION: Helping to unearth misunderstood animal sounds for the first time.

Baby sloths often call for their mothers when they are lost or in distress, and scientists have shown that vocalization between infants in mothers is critical to communication in the first 6 months of total infant dependence. However, as adults, Sloths are primarily silent - so after the 6-month threshold is past, audible communication ceases. Or so we think...

A study on Barro Colorado Island inferred that the sloth calls are tuned to a frequency outside the bandwidths dominated by insects and birds in the forest. Three-toed sloths in the study had vocalizations that corresponded with the average frequency of canopy birds. Two-toed sloths are below average of birds singing in the lower part of the forest. Can Ben help discover that sloths do indeed communicate through sound into adulthood? With sophisticated acoustic technology, we will record these sloth interactions to help understand if their vocalizations are in a frequency outside human audible range, or simply not happening at all.



“WING MEN”

Location: Costa Rica

MISSION: Speeding up evolution through sound.

The Long Tailed Manakin is a resident of Central America that has phenomenal acoustic and visual displays. An incredibly unique element of their mating ritual is that males perform cooperative mating dances and attract more females when their dances and calls are more synchronized.

Synchronization happens over time, and male Manakins that spend more years together improve their odds of mating. But as these birds have been studied over time, scientists predict that Long-tailed Manakins would experience a 62% loss of habitat in the next 50 years due to human impact in Costa Rica.

Will recording the sounds of these intricate synchronized mating calls speed up the rehearsal process, to allow for faster long-term bonding between cooperative males? If so, Ben’s skillset could help these birds achieve greater breeding success, effectively aiding this evolutionary process?



“A BUG’S LIFE”

Location: South America

MISSION: Do butterflies speak?

Butterflies are known for their erratic flight patterns – which makes them fun to watch and difficult to catch, a technique they have developed over time to avoid their biggest predator, birds. Is it possible they are doing more than just defensive flight to survive? Scientists believe that butterflies use their ‘ears’, on the underside of their wings, tilted in the direction of what they are trying to hear. As predators have evolved over time to become quieter, these butterflies, their prey, have also developed a more sophisticated way of sensing their enemies.

For some time, it has been generally understood that butterflies communicate with each other through chemical signals, but one species in South America, The Cracker Butterfly – has developed a sound-specific technique. By flapping, or ‘cracking’ it’s wings together – Scientists believe it is signaling to ward off enemies, and even court potential mating territories- but much of butterfly communication is unknown. Can a controlled sound experiment conducted by Ben, which requires highly specialized supersonic equipment for detecting insect sounds, unlock the deeper meaning behind these mysterious communications between Butterflies?



“RE-FROGULATING”

Location: Honduras

MISSION: Reversing extinction through sound.

Deep in the mountains of Northwest Honduras the spike-thumb Frog are clinging to survival – facing the constant threats of deforestation and a lethal fungus that dwells on the forest floors. For the critically endangered frogs, captive breeding is the final hope to saving these populations from disappearing from the earth forever. Research shows that playing familiar sounds for frogs in captivity increases competition and thereby inspires breeding. How can acoustics unlock the solution to revitalizing an endangered frog population in Honduras?

Ben heads up into the mountains of Honduras to capture rare frog vocalizations that will be the catalyst for rebuilding threatened species of frogs. Scientists who have spent time understanding these frog behaviors have confirmed that they only vocalize under two conditions – at night and underwater. This ups the challenge for Ben, as a night trek into the jungle combined with highly specialized underwater recording technology will be required to record clean takes of this delicate sound. Back at the lab, Ben’s sounds will be put to the test.



“RHYTHMIC REEFS”

Location: The Philippines

MISSION: Do coral reefs have rhythm?

Research shows that coral reefs – one of the most complex living organisms, have a rhythmic pattern to their existence. Every dawn and every dusk, coral polyps, arthropods, and Sweetlip fish become more active like the sounds of a forest just before dawn.

The Philippines are world renowned for their coral reefs, but also shares notoriety for being the world capital of illegal dynamite fishing. The visual impacts of a bomb on a coral reef are obvious, but Ben can prove that the effects are even greater from an acoustic perspective?

Just how far does a shockwave travel underwater, and how does it affect life in these precious ecosystems? Ben will help show that coral reefs, and their fragile inhabitants like the Sweetlip fish respond to rhythm and can truly ‘hear’ damage.



“NEW THEME SONG”

Location: Australia

MISSION: Can the power of acoustics help whales re-learn old songs?

Like humans, researchers have proven that Humpback whales have created their own speaking ‘dialects’ – informed by their pod and where they come from. These sounds are learned and forgotten in a cyclical pattern but have become increasingly simplified as certain populations shrink over the years. A recent study in East Australia showed that humpback whales change their sound gradually, based on certain embellishments introduced to the group by a new member and then learned by the rest.

Humpback vocalizations typically have an audio frequency between 80 and 4,000 hertz. But newly described pulse sounds were found to have a significantly lower frequency of around 40 Hz – meaning we have never truly heard them in this way.

Ben will dive deep into the Australian oceans to hear these complex and mysterious sounds first hand. He will then compare these new humpback sounds with old recordings of songs from generations past. Will we be able to hear these low frequency sounds for the first time and assess their meaning? Through playback, can the humpbacks re-learn these forgotten calls of their ancestors?



“FENCE OF SOUND”

Location: USA

MISSION: Helping to save hundreds of animals from becoming Roadkill along major freeways.

The presence of roadkill as a result of collisions between humans and wildlife are painfully common all around the world, especially in the US with deer and hedgehogs in the UK.

Protecting wildlife from wandering onto roads with physical barriers can be difficult, expensive, and challenging to maintain over time with the impact of weather. Researchers in Tasmania have shown that creating a ‘virtual fence’ where flashing lights and alarms are triggered by animal too close to the yellow line - has drastically reduced their rate of roadside animal deaths.

Inspired by the work in Australia, can Ben help implement this same method on American soil? Ben will record and mix a medley of both natural alarm calls and manmade sounds to keep these animals safe. Where US boasts over 4 million miles of freeway across its 50 states - can sound help reduce these wildlife casualties?

