

In Shakespeare's *As You Like It*, Jaques begins a monologue with "All the world's a stage" if you will indulge me in mixing division metaphors. Tonight, from a tantalizing courtship dance to demonstrations of intimidating power, from a waggle dance to reveal food location to a tricky paents's feeble cries as he drags a "broken" wing to lure a predator away from his clutch of eggs vulnerable in the nest, many animals are peak performers. Get ready to applaud these showboats in the **TAKE A BOW DIVISION!**

Northern Elephant Seal (1) vs. Asian Cornborer Moth (15)- Our number 1 seed is the Northern Elephant Seal (*Mirounga angustirostris*). Spending most of their time on the open sea, male Northern Elephant Seals arrive on beaches from the Gulf of Alaska down to Baja California in late November-early December to stake their claim. They battle other males for beach dominance until the breeding season in late February and March. While physical confrontation does occur, elephant seal "dominance hierarchies are established and maintained primarily by stylized visual and vocal threat displays" (Shipley et al. 1992). They rear up and ROAR to intimidate rivals.



The Asian Cornborer Moth (*Ostrinia furnacalis*) is a nocturnal insect native to Asia and Southeast Asia and shows singing behavior! In 2009, Nakano and colleagues reported "Moths are not silent, but whisper ultrasonic courtship songs." Asian cornborer courtship songs induce female freezing behavior and increase the likelihood of

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successful courtship. Freezing responses to ultrasound by moths are originally an antipredator reaction to echolocating insectivorous bats.

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Tonight's battle takes place on the beaches of Guadalupe Island. Northern elephant seals were thought to be extinct by 1884, until a remnant population of eight individuals was discovered on Guadalupe Island in 1892. Our Asian Cornborer Moth combatant is transported to the sands of the island - within the territory of a bull Elephant Seal. As a potential rival appears near the territory boundary, our bull Elephant Seal rears up to deliver an intimidating roar of dominance that sends the Cornborer Moth into a flight turbulence wing-spin, somersaulting through the air... and off the field of battle! NORTHERN ELEPHANT SEAL WHOOSHES CORNBORER MOTH! Narrated by Prof. Chris Anderson.

Leatherback Sea Turtle (4) vs. Singing Mouse (13) - Scientific binomial (aka standard) names can tell us a lot about an organism. For Leatherback Sea Turtle (*Dermochelys coriacea*), the genus/species name describes a leather-skinned

turtle: Greek words derma = skin/hide and chelys = tortoise/turtle + Latin coriaceus = of leather. Leatherbacks live most of their lives in tropical, temperate & subarctic oceans, returning to steep, coral-free tropical beaches to lay their eggs. When hatching, Leatherback babies vocalize, which has been hypothesized to help the young coordinate their emergence into the world.



The standard name for Singing Mouse (*Scotinomys teguina*) tells us about its appearance: *Scotinomys* = dark mouse and habitat: *teguina* = concealed by grass. They live in montane cloud forests (~3,600-9,700 ft) from southern Mexico to Panama. Singing Mice communicate using scent and song. The complexity of their vocal communication has led neuroscientists to study them as a model system to reveal insights into human speech & cognition.

Tonight's battle is in Cape Canaveral, Florida, where thanks to conservationists and the US Air Force Leatherback nesting increased by 14%! Our 2,000 lb female combatant is excavating her nest

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with her front and rear flippers. SWOOSH! Our extremely bold and virile male Singing Mouse is in the cloud forest in Costa Rica, on the edge of two female singing mouse territories, serenading them both when he is transported by MMMagic to Leatherback nesting site. As Leatherback completes the final scoop of her nest chamber Singing Mouse somersaults into the hole, just as Leatherback's first pulse of 40 eggs is released PFFFFFTTTTTT!!!! PLOP! PLOP! PLOP! Our bold Singing Mouse isn't phased by this disruption. Motivated by androgenic and stress hormones, he scurry-climbs atop the egg pile to continue his swan song. Leatherback releases the remainder of her clutch - 40 more eggs - with a mass equivalent to 246 singing mice. LEATHERBACK CRUSHES SINGING MOUSE! Narrated by Dr. Tara Chestnut.

Howler Monkey (6) vs. Swamp Nightjar (11) – Colombian Red Howler Monkeys (*Alouatta seniculus*) have reddish brown fur and stubby gray noses. Males can weigh up to 17 lbs and have bodies ~2.5 ft long not counting their grasping

(prehensile) tail! Howler monkeys have voice boxes with an enlarged hyoid bone to make their distinctive territorial roars thus earning their spot in the Take A Bow Division.



Unlike the arboreal monkey, the Swamp Nightjar (*Caprimulgus natalensis*), is much more down to earth, literally! They tend to roost on the ground with their feathers taking a scaly appearance. The bird comes in at 10 inches and approximately 2.5 oz. During the nesting period, when swamp nightjars incubate eggs, the male swamp nightjar will perform a "broken wing display" feigning injury to lure terrestrial predators away from the vulnerable eggs.



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Our combatants meet in the lower montane wet forest of the on the eastern slope of the Central Cordillera of the Colombian Andes, home habitat of the Howler Monkey. Howler Monkey and his family are preparing to settle down for the night, moving through the forest toward a preferred sleeping tree, using their grasping tail as a "5th limb" to safely clamber through the branches of the canopy. Over the course of the day, Howler Monkey ate 3 distinct meals, with 2 hour naps following each meal. Howler Monkey had an especially dramatic day, as his troop and the neighboring troop converged on a fruiting Fig tree, triggering a midday ROAR BATTLE over the precious figs.

MEANWHILE in the woodland grasslands of Odzala "at the northern limit of the grassy plateau of the middle Congo," the nocturnal Swamp Nightjar sits on a clutch of recently laid eggs, vigilant for predators (Dowsett-Lemaire 1997). Male Howler Monkey and his family have settled on the lowest, largest branches of a massive tree. Male Howler Monkey sits with his back against the trunk while the rest of his family cuddles in a single group nearby. MMMagic translocates the Swamp Nightjar to the branch adjacent to male Howler Monkey! CHOP CHOP CHOP!!!!

The Swamp Nightjar is making its signature nocturnal call "CHOP CHOP CHOP"!! Male Howler Monkey and family instantly startle at the strange, squatty bird in their midst... and the bird seems to be falling to pieces?! IT'S MARCH & SWAMP NIGHTJAR IS MOULTING!

Howler monkeys "invariably" choose to sleep on the lowest branches and this branch just became one too many crowded. Male Howler Monkey hustles his family away from Swamp Nightjar to another sleep tree in the forest! Swamp Nightjar pounces on a tasty insect! SWAMP NIGHTJAR DISPLACES HOWLER MONKEY!!! Narrated by Profs. Katie Hinde and Mallika Sarma.

Great White Shark (3) vs. Elegant Dancing Frog (14) - The Great White Shark (*Carcharodon carcharias*) are the world's largest predatory fish and can live up to 70+ years in temperate and tropical coastal waters and continental shelves worldwide. Named after their white underbellies, great white sharks' topsides can be brown or gray, camouflaging them when viewed from above. Females can grow bigger than males, with the largest up to ~6m long.



The Elegant Dancing Frog (*Micrixalus elegans*) is a diminutive amphibian endemic to the Western Ghats in India, between the states of Karnataka and Kerala (Mal Sarma's motherland!).

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Well-camouflaged for their environment, elegant dancing frogs are reddish-brown with scattered yellowish gray spots, dark brown bands on their limbs, and a dark blackish-brown on the sides of their head. Little little, these frogs are no bigger than an inch long. Elegant dancing frogs get their name for their courtship dance to impress females. Many frog species use croaking (sound-based) performance during the mating season, but in their noisy habitat these frogs use the visual art of DANCE!



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Tonight we find Great White Shark eating her recent fur seal kill. Around her, ocean water is tinged red with blood as seabirds gather for tasty morsels of marine mammal fat... but seabirds aren't the only animals interested in the carcass. Nearby a smaller great white shark is drawn to the blood trail, looking to exploit the meal. Great White Shark tail flaps to socially signal her possession of the seal carcass. MEANWHILE, on the Honey Valley Estate, Karnataka, male Elegant Dancing Frog performs his display, extreme even among foot-flagging frogs, extending BOTH his hind limbs above his head while rotating them backward in an arc" when MMMagic transports Elegant Dancing Frog atop the Great White

Shark's seal carcass! Great White Sharks broad, serrated teeth gouge chunks of flesh from large prey, violently bobbing the fur seal carcass in the water! The hurky-jerky carcass TUMBLES Elegant Dancing Frog into Great White Sharks maw!! WHITE SHARK EATS ELEGANT DANCING FROG! Narrated by Profs. Mallika Sarma and Katie Hinde

Virginia Opossum (8) vs. Eastern Hognosed Snake (9) – Opossums are the only marsupials in North America. Virginia Opossum (*Didelphis virginiana*) has a 40cm long body covered in thin gray fur, and a hairless 28cm long tail. Opossums can weigh anywhere from 2 to 3.5kg – with urban individuals getting 37% larger! Opossums' thespian skills are so great, their signature move has become a saying: "playing possum". This comes from their convincing performance of death feigning, to discourage predators.



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Eastern Hognosed Snakes (*Heterodon platyrhinos*) are very variable in color and pattern, yet they are clearly distinct thanks to their upturned, blunt nose, which helps them burrow through the soil.

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Hognose snakes are masterful actors. When threatened they first bluff, changing shape to look bigger while hissing and striking. After that they perform death feigning, to discourage predators. (déjà vu?).



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Our combatants meet in Babler Memorial State Park. The 988ha park, just outside St. Louis, MO, is home to BOTH Opossum and Hognose Snake! This early spring evening, we watch as both critters forage among bushes near the edge of a grassy field, unaware they are nearby. Suddenly noticing each other, Snake and Opossum both go into anti-predator performances! Opossum hisses with large open mouth, while Hognose snake hisses right back! Hognose snake quickly sucks in air to expand its body while flattening ribs near the head thanks to hinge-joints. Looking hooded like a cobra, Hognose raises its head, hissing loudly and striking at Opossums' face – just like a rattlesnake! Opossum doesn't fall for the bluff! Opossums are highly resistant to snake venom, surviving 60x the lethal dose of diamondback rattlesnake venom!! In fact, opossums will eat most venomous snakes! It's bluff called, Hognose

snake moves to the backup plan! It begins to writhe on the ground violently, thrashing its tail wildly! Finally, it goes still, belly up with tongue sticking out of its mouth! Is this enough to trick the trickster Opossum??

HOLD ON, A FRISBEE JUST FLEW INTO THE BUSHES!!! A FRISBEE HAS ENTERED THE FIELD OF BATTLE!! FOLLOWED BY A... YEP IT'S A BORDER COLLIE MIX FOCUSED ON CATCHING HER FRISBEE... Oh no! The border collie COLLIDES with Opossum as she leaps to catch her Frisbee... Ok, border collie is now racing her Frisbee back to her person and Opossum... ah yep, as expected... The canine collision has triggered Opossum to Play Possum! Bending head towards its belly, Opossum tenses all its muscles and falls on its side. Completing the show, Opossum defecates, ensuring that no predator would risk an unpleasant bite. Sooo... ummm... ah... both combatants are motionless on the field of battle.



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<15 minutes later>

Was that a twitch!?! Did the Opossum just move?!? No twitching. Opossums playing dead is not just great acting. Known as tonic immobility, stress levels trigger hormonal responses, rendering opossums catatonic and unable to respond to stimuli until recovered from the catatonic state. Inside the Hognose Snake, however, hormone levels appear normal. Death-feigning in Hognose appears to come from innate nervous reflexes and not responses to adrenaline.

<30 minutes later>

Hognose snake slightly lifts its head, flicks its tongue, and looks around. Opossum remains fully still on the ground. Immobility length in opossums can vary with severity of the stress, but can last up to 9 hours! Hognose snakes rarely play-dead for more than 20min. Sensing the time is right to make a getaway, Hognose Snake rolls over and quickly LEAVES THE FIELD OF BATTLE!!! Leaving Opossum still motionless on the field of battle. OPOSSUM OUTLASTS HOGNOSE SNAKE!!! Narrated by Prof. Brian Tanis.

Caatinga Coral Snake (7) vs Flame Bowerbird (10)

The Caatinga Coral Snake (*Micrurus ibiboboca*) genus name is Greek in origin, mikros = small & oura = tail. The species name 'ibiboboca' is the indigenous name given to this species in Brazil - it is not of Portuguese origin. Caatinga Coral Snakes are small, non-aggressive, but HIGHLY VENOMOUS with a typical pattern of red-black-white-black-white-black-red bands. Male Caatinga Coral Snakes engage in ritual

battles that involve aligning their bodies next to each other, entwining, twisting, rolling, and ultimately snapping their heads to force their opponent's head below their own.



Flame Bowerbirds (*Sericulus ardens*) occur in Papua New Guinea & Indonesia. Males show their fitness with bright colors, a flame red head, yellow body & black wings & tail. Similarly-sized females have olive-brown backs with orange bellies. Bowerbirds have long attracted our interest because of male bowerbirds' elaborately decorated courtship bowers. Flame Bowerbirds builds an 'avenue' style bower. Male Flame Bowerbirds bring the ladies to the yard by lining stick walls with purple fruits & flowers & the runway with yellow-brown leaves. The outside of the bower is decorated with blackish glossy leaves.



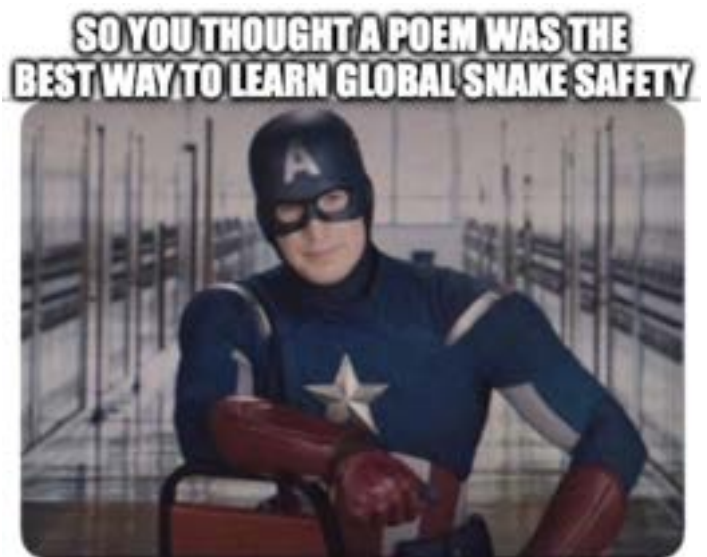
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Tonight's battle takes place in Parque Nacional de Ubajara, in Ceará State, Brazil. "Caatinga" is a Tupi word meaning "white forest" which describes the dry shrubland and thorn forest.

At home, Flame Bowerbird combatant is a striking male weighing in at ~160 grams. After gorging on fruits, he is scoot-kicking the duff on the forest floor when the #MMMagic portal transports him to the Caatinga habitat. Our Caatinga Coral Snake is slowly weaving it's way across the forest floor along the edge of a trail & coils in response to the sudden appearance of the scoot-kicking Bowerbird. Nearby a group of tourists is on a wildlife tour. Jack, a 27 year-old from the US, sees what he thinks is a harmless milk snake because of the childhood rhyme "red & yellow can kill a fellow; red & black, friend of Jack" not knowing that rhyme applies to coral snakes in the United States, but not ALL coral snakes!

Jack picks up Coral Snake to show his pals WHEN THE CORAL SNAKE DEFENSIVELY VEMON-STRIKES JACK'S FOREARM! #NotYourFriendPal. Bowerbird watches the action from a low-hanging branch. Jack's bite site starts tingling with a growing numbness & waves of intense pain. Coral snake neurotoxic venom can cause respiratory paralysis in mammals, including rarely in humans! The tour guide and a park ranger converge on Jack! The tour guide organizes a medical evacuation. The park ranger identifies the snake & radios ahead about the needed antivenom to medical personnel! The park ranger, trained with proper snake handling methods and with proper equipment, catches the snake to relocate it

further from the tourist trail, as the tour group continues with a replacement guide on their wildlife tour & emphatic instructions to stay on the trail! Bowerbird flits to the ground to collect the most beautiful light purple-ish flower he's ever seen to add to his bower, a mimosa. BOWERBIRD DEFEATS CORAL SNAKE! Narration by Dr. Tara Chestnut.



Pronghorn (5) vs. Wrinklenosed Bat (12) - Pronghorn (*Antilocapra americana*) is not actually an antelope but is the closest relative of giraffe and last year's almost champion Okapi! Pronghorn males are larger than females and can weigh up to 70kg. Male pronghorns have numerous display behaviors, both to court their ladies and to defend their territory against encroaching males. A go to move is the SPUD. a stylized sniff- paw- urinate-defecate sequence. Pronghorns confront interlopers by lowering their heads, depressing their ears and walking 15-25 m of intruding bucks; the walk then becomes a slow, stiff deliberate gait ending in a broadside threat. "Do you turn your

R1: TAKE A BOW DIVISION

side to me sir? I do but turn my side."



If you've ever imagined what a prune and bat would look like if they were combined, meet the Wrinklenosed Bat (*Centurio senex*)! These fruit-eaters are aptly named for their short and wrinkled faces, with strong jaws adapted for biting hard figs and seeds. Males have more pronounced wrinkles and a skin fold on their chin. These masked seducers pull the skin over their face while hanging from a branch, flapping their wings, and chirping to impress visiting females.



The setting sun glows golden behind the Teton Mountains as a small herd of pronghorn make their way near Antelope Flats, a stopover point of their spring migration. At the head of the herd is our dominant male Pronghorn, tongue flicking to his ladies. In the deep snow, the pronghorn travel single file, not to hide their numbers, but so that the following does and juveniles conserve energy by following the path of others. Meanwhile, amidst the buzzing calls of cicadas in the muggy, humid forests of Belize, our Bat is just waking up in his cozy vine roost. He stretches a delicately patterned wing, ready to take flight just as the MMMagic translocation takes hold dropping him on a wooden fence post, being blasted by the cold, stiff breeze of Wyoming! Wrinklenosed Bat pulls his mask up his fast against the chill and wraps his wings in tight. The appearance of Wrinklenosed Bat causes Pronghorn to stare at the disturbance and alarm snort, "an explosive forcing of air through the nostrils, which the Klamath Indians described as "Cha-oo" (Kitchen 1974), but Pronghorn quickly infers no danger from Bat.

Pronghorn moves towards the fence and fencepost occupied by the Bat, eyeing a small cluster of shrubs just on the other side that would make a great wind break and sleep spot for the group to curl up and clump slumber party. Pronghorn do not typically jump fencing, preferring instead to crawl under wire fencing. Pronghorn bows down and begins to squirm under the fence wire. He successfully ducks his head under and is moving forwards. Pronghorn erupts in a loud pain vocalization! This barrier has not yet been updated

R1: TAKE A BOW DIVISION

with pronghorn-safe fencing and the sharp metal barbs of the lowest wire gouge deep lacerations in the Pronghorn's back! Startled by the Pronghorn's cries of pain, Bat takes flight, seeking a quieter (and warmer) spot exiting the FIELD OF BATTLE. PRONGHORN OUTLASTS WRINKLENOSED BAT! Drops of blood roll down Pronghorn's tan back to drip into Wyoming's white snow. Narrated by Dr. Alyson Brokaw and Prof. Katie Hinde.

Forest Elephant (2) vs. Honey Bee (15) - Forest elephants (*Loxodonta cyclotis*) can weigh up to 6000 kg! They eat leaves and trunkfuls of fruit. These "Megagardeners" of the forest eat more seeds from more species than most large verte-

brates. Their extinction would be catastrophic for the whole environment. Forest elephants, like savanna elephants, communicate with "rumbles" / infrasonic low-frequency tonal vocalizations at 15–25 Hz with individual signatures that can travel relatively great distances allowing coordination from afar. The Elephant "vocal repertoire" can express their emotional state and includes sounds of excitement (Roar, Mating Pandemonium, Play Trumpet) and fear or injury (Scream, Bellow, Groan, Trumpet Blast, and Snort).

Honey bees (*Apis mellifera*) are widely distributed throughout Afro-Eurasia with many sub-species, including *Apis mellifera adansonii* known for its



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rapid and highly aggressive swarming in defense of their hive. Honey bees are ~0.15 grams (1 elephant = ~68 million bees). As bees forage for pollen and nectar, they assist plant reproduction by delivering pollen while visiting many plant blooms throughout the day. Honey bees live in colonies of queens, workers, and drones.

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Tonight's battle occurs in the 'Gamba Complex of Protected Areas in SW Gabon, consisting of two national parks (Loango and Moukalaba-Doudou) that are divided by an industrial corridor called the Rabi-Ndogo Protected Area where oil companies operate. This lowland tropical rain forest supports one of the largest remaining forest elephant populations, and is home to hyrax, pangolin, chimpanzees, gorilla, red river hog, bush buck, mongoose, leopards and honey bees.

Approaching sunset, a massive Bull Forest Elephant is foraging on fruit in the forest. Nearby, two other forest elephants forage, as they socially forage together. Nearby in the forest, combatant Honey Bee, *Apis mellifera adansonii*, has discovered a smorgesboard of nectar 67m from the hive. Honey Bee rapidly zigzag flutters above the Bull Elephant to reach the hive to alert the fam!

The massive bull Forest Elephant poops. His companions poop too, as forest elephants are inclined to synchronously defecate. Bee is one of the last foragers to return to the hive and she presents her waggle dance to indicate the location of nectar. If the nectar had been much closer, her waggle dance would have involved round dance and sickle dance elements as well.

A hard rain begins to fall, March is the rainiest month here, and Bull Forest Elephant steps closer toward the fallen fruit at the foot of a bitterbark tree (*Sacoglottis gabonensis*)... THE LOCATION OF THE BEEHIVE! Inside the hive, Honey Bee's companions are not excited by the nectar report and are disinclined to forage on a dark and rainy night. Still, the hive is still ABUZZ as most every worker returned from daily foraging. Bull Forest Elephant, eager for bitterbark tree fruit, abruptly stops as another sound permeates the patter of the rain... A BEEHIVE! Bull Forest Elephant rumbles, listening to the buzzing of the currently undisturbed bees... but also detects that this colony has an active well-established queen cell producing many bees. Rich memories triggered by sound (and possibly smell) bring forth memories of the past for the Forest Elephant!

FOREST ELEPHANT FLASHBACK
<dudelelududelelududelelu>

A young Bull Forest Elephant feeding on a tree disturbs a beehive. Aggressive bees pouring from the nest within a minute! BEES STINGING HIS EYES!!! Elephant goes berserk, thrashing, spinning, & screaming!

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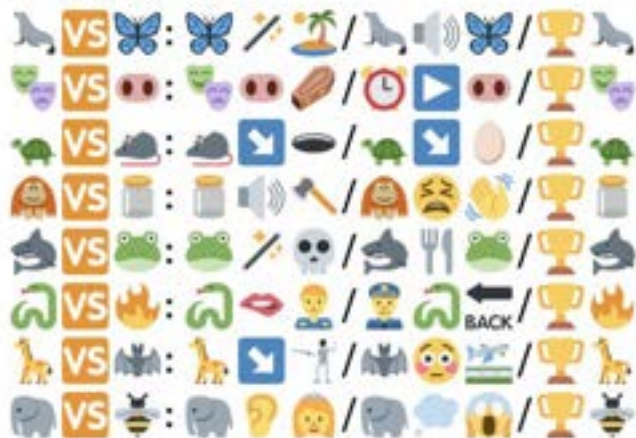
Having learned his lesson long ago, Forest Elephant slowly gives the beehive a wide berth and shows why BEE-AVERSION may be a key to reducing elephant-human conflict where wildlife habitat meets agriculture. Bull Forest Elephant and his companions travel to visit another known bitterbark tree in the forest BEYOND THE FIELD OF BATTLE! HONEY BEE OUTLASTS FOREST ELEPHANT! Narrated by Profs. Marc Kissel and Katie Hinde.

READ ALL ABOUT IT by Katie Hinde, Margaret Janz, Melanie Beasley, Anali Perry, Anthony Costantini, & William Yates

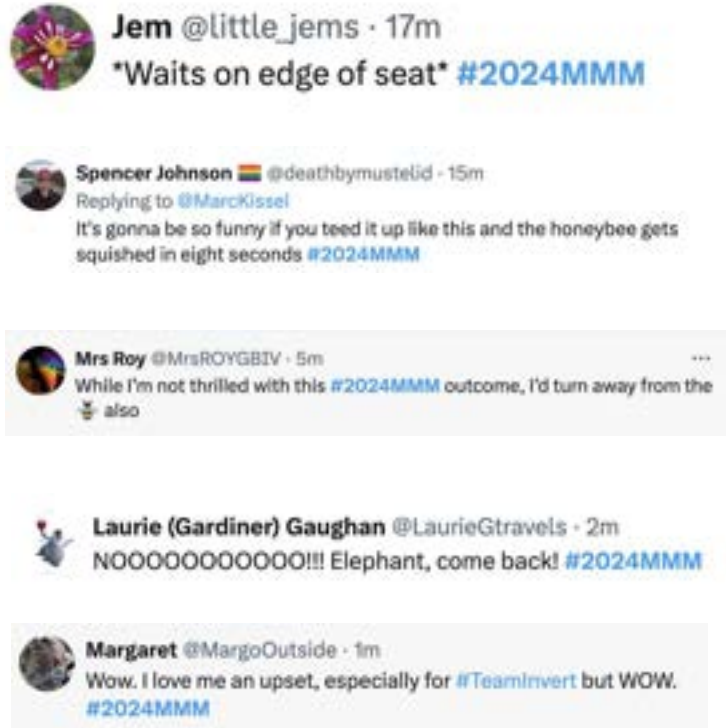
 **Jessica Popescu**
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#2024MMM

TAKE A BOW ROUND 1
EMOJI BATTLE



7:29 PM · Mar 20, 2024 · 5 Views



CHECK OUT [MMM-themed videos](#) from AUMNH! THANK YOU!



AND a **special thanks** to our friends at Society for Integrative & Comparative Biology for their essay on the worst-seeded combatants! [Check it Out!](#)

CITATIONS

Leatherback Sea Turtle vs. Singing Mouse

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EPIC ANIMALS

English bracket vs. 0



ROUND 5 WINNERS 8 POINTS

ROUND 4 WINNERS 3 POINTS

ROUND 3 WINNERS 2 POINTS

ROUND 2 WINNERS 1 POINT

ROUND 1 WINNERS 1 POINT


WILD CARD WINNER 1 POINT

CHAMPION 11 POINTS

CONNOISSEUR CRITTERS

RAINBOW COLLECTION

English bracket vs. 0



ROUND 5 WINNERS 8 POINTS

ROUND 4 WINNERS 3 POINTS

ROUND 3 WINNERS 2 POINTS

ROUND 2 WINNERS 1 POINT

ROUND 1 WINNERS 1 POINT

WILD CARD 1 Point / 1

ROUND 1 1 Point Each / 11

ROUND 2 2 Points Each / 11

ROUND 3 3 Points Each / 14

ROUND 4 5 Points Each / 16

ROUND 5 8 Points Each / 16

CHAMPION 11 Points / 11

Total 118 Max

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