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Endangered Desert Tortoises

A desert tortoise stumbles across the Mojave Desert. A sun this hot would typically cripple any plants in a hundred mile radius, but not here. In other places, one hundred and twenty degree heat would make life unbearable, but the Mojave ecosystem is so advanced because it's built to not only survive, but thrive in these challenging conditions. The desert tortoise weaves in and out of new grasses that have taken over the previous plants, red brome grass being the most common. Slowly, the desert tortoise arrives at the foot of a Yucca, right next to a series of Joshua trees. At the base, there's a tunnel, leading to a cool home that protects the desert tortoise from the sun. The desert tortoise will spend more than ninety percent of its life in burrows underground.

The sun fades as if the colors are slowly being pulled out from the sky. Chirps and hoots fill the vast desert, a sign that the nightlife is about to begin. Nearby burrows are empty, the once flourishing population has been reduced drastically in the last five decades. Other animals, birds, and insects live in the burrows dug by the desert tortoises. Some endangered, like the Burrowing Owl, rely on these burrows to live safely away from predators and the blistering heat signature to the area.

The next day, a rare thunderstorm arrives. The desert tortoise gingerly steps out of the burrow. He looks up at the sky, his dry mouth eager for the rain. He starts making his way towards the same rock as the previous time, one with a shallow center, allowing the water to

pool. The desert tortoise approaches the rock, and lightning strikes. Rain starts slowly splashing onto his shell, there's water for the first time in months (Tuma). Desert tortoises can go without water for months, but that doesn't mean they like to. He bends down and his eyes reflect the lightning raging on above. A thunderstorm can be chaotic, but it's life to the desert.

A century ago, this area was filled with desert tortoises like him. Any researcher, scientist, or curious soul could venture out in the spring and fall and would see hundreds in one outing. In the last few decades, however, a multitude of threats have changed that. Desert tortoises have been faced with new threats and experienced extensive habitat loss and degradation, predation, and disease.

Desert tortoises mainly inhabit the Mojave Desert, which is found in the Southwestern United States: a wide expanse of wilderness that houses many plants, animals, and reptiles found only in the area. The sun pierces the land, making the soil glisten when rain has fallen. In the last century, the Mojave Desert has been transformed into a network of bustling cities and towns with complex infrastructure and roads. As a result of the booming growth, many desert tortoises have lost their homes and have had to migrate to new areas. Roads have been a major threat in the spread of urbanization. Many desert tortoises are run over on roads in the desert while trying to cross. One desert tortoise was separated from her community when a road was being built. For weeks, she walked up to the road, looking across to the wild expanse, hoping the cars would slow down for a while so she could safely cross. Others make the brave journey, but many are severely injured in the process. Many desert tortoises have not only lost their homes, but have been displaced from their communities as a result of the roads being built. One solution that has been implemented involves overpasses, underpasses, and fencing (Fusari). Overpasses and underpasses have been exceptionally important because they allow desert tortoises to cross and

reunite with other members of their community on the other side of the road without danger. Fencing has also been key because it protects desert tortoises from trying to cross in areas where it is unsafe to do so. Fencing has been very successful in Nevada, yet it's important to acknowledge that it has not been implemented everywhere, and that is largely due to a lack of funds. Another important factor that has led to habitat loss is the increasing use of Off-Highway Vehicles. When people drive their motorcycles and off-highway vehicles out on illegal roads, they damage the environment, making it difficult to recover. When the desert is damaged, it's nearly impossible to recover (Tuma). Desert tortoises also seek out shade often, mainly cooling down under cars in parking lots. It's vital for people to check under their car before driving away to see whether a desert tortoise is sitting underneath.

Solar development is an important, yet often overlooked, threat that causes habitat degradation to the already dwindling desert tortoise population (Donnelly). Clean energy is often advertised as the best possible solution, but when large-scale solar facilities are put in place over tens of thousands of acres, desert tortoises have to be translocated and they lose their home. The large solar plants also "mow" the plants down, which leaves the roots intact but cuts off anything above soil level. This permanently damages the ecosystem. Many of these facilities are being built on untouched land. Instead, it would be more beneficial to build on disturbed land, like old mine sites. The best solution, however, would be to build solar on city rooftops. This would allow the natural desert ecosystem to remain intact, and would benefit the cities because the source of power would be even closer. While this approach could be slightly more expensive in the short term, it plays a key role in ensuring that numerous endangered species, that call the desert home, don't go extinct.

In the past fifty years, there has also been an exponential surge in the raven population, who are one of the main predators of desert tortoises. A raven swoops in, cracks open the egg, and kills the baby desert tortoise that was minutes away from being born. Young desert tortoises stay small with a soft shell for the first five years of their lives (Tuma). During that period, they are extremely prone to being killed by ravens. The problem doesn't end there, however, because ravens have also been known to attack adult desert tortoises, flipping them over, piercing through their shell (MacDonald). Desert tortoises don't stand a chance. Coyotes, another main predator, eat desert tortoises when their own food supply of jackrabbits dwindles as a result of urbanization. Correlations have been found that when the jackrabbit population decreases, coyote hunting increases, and the desert tortoise population decreases. A proposed solution would use egg oiling to decrease the raven population, and allow the desert tortoise population to recover, a vital step with the population being so endangered. Egg oiling decreases the number of raven eggs that survive, which could be a key factor in protecting desert tortoises (Tuma). The method, however, was struck down in a lawsuit in the 90s. The case was settled, and no egg oiling could be used unless it was targeted for the ravens responsible. Other than egg oiling, no other methods have been found that are as effective. A potential solution might exist in a curious raven quality, however. Ravens gather and congregate at night. Since they are in one place, it is easier to transport them somewhere else. Government agencies and organizations are responsible for carrying out such large-scale projects, but people also play a big role in protecting desert tortoise populations from ravens. Ravens have increased in number so much due to the amount of subsidies available (Averill-Murray). When people leave trash cans open or artificial ponds uncovered, ravens have a surplus of their food and water, making their population grow even

more. By closing trash cans and keeping scraps covered, people can make an impact and help protect desert tortoises.

The main disease that affects desert tortoise is an upper respiratory tract disease. Upper respiratory tract diseases, like COVID-19, spread quickly by air, and are responsible for significant die-offs. Before desert tortoises were listed as a threatened species on the Endangered Species Act, they could be kept as pets. The disease had originated in the captive population and had spread when several of the captive desert tortoises were released back into the wild. The disease is difficult to treat and spreads quickly. That is why it's so important to ensure that captive populations are not released back into the wild (Tuma).

The desert tortoise population is rapidly decreasing, but there are ways to protect the species and prevent extinction. People can make an impact and help mitigate all of these threats by joining desert tortoise conservation organizations, volunteering, and following laws and regulations set in place to protect the desert ecosystem.

People can help create an impact directly by joining organizations. The Desert Tortoise Council and The Tortoise Group are two organizations with a mission to protect and conserve the desert tortoise. When more members join, it makes it more likely that the organization's voice will be heard during important legislative decisions. Politicians will be more likely to act in the organization's favor when it is composed of more people (MacDonald). Also, the greater the number of members, the greater the number of donors that provide funds for additional research and monitoring. Monitoring needs to be done at least once a month on each desert tortoise. This ensures that the population is healthy, and makes it possible for researchers to see additional threats early on. Research has given great insight into current threats and it might be able to help combat future ones.

People can also volunteer with various organizations. The Desert Tortoise Council organizes cleanup and planting events. Since so many invasive plant species have taken hold in the desert, desert tortoises don't have an adequate source of nutrition. The non-native plants also suddenly dry out, causing fires that are unnatural to the area. The fires, flames engulfing the plants, paint a horrid scene of red and orange dancing against the darkness of the night. Fires are a major threat because they suffocate desert tortoises, who are often unable to escape in time. By planting more scrubs, bushes, and plants that are natural to the area, volunteers can directly help by ensuring that desert tortoises have a good food supply. Planting natural species also helps prevent wildfires, which benefits the entire desert ecosystem.

Another important step people can take is to ensure that laws and regulations are being followed by not driving on illegal roads. These roads were marked on purpose, and because the desert ecosystem is so fragile, once it's damaged, the damage remains for centuries. There are specific designated areas where people can drive motorcycles and off-highway vehicles. By following these rules, people will be able to make a difference.

For millions of years, desert tortoises have walked the deserts, helping all living things thrive in the harsh environment. They have endured harsh winds and treacherous droughts, raging fires and predators the size of the T-Rex. Desert tortoises have looked into the eyes of difficulty and have pushed forward. They haven't given up, so people shouldn't give up on them. They are the state reptile of Nevada and California. Imagine what it would be like for these two states to be the ones who didn't take action and were responsible for its extinction. The desert tortoise population has been exponentially decreasing. It is five percent of what it was fifty years ago, but there is a chance that the species could be protected. People can make an impact by joining organizations, helping out in the field, and making their voices heard by electing officials

that will protect the species. Even small things, like closing trash can lids, however insignificant they may seem, are a step in the right direction, and make a world of difference for desert tortoises. Desert tortoises are a flagship species, and they indicate the health of the ecosystem. If desert tortoises are healthy and thriving, the desert is doing well. If desert tortoises are struggling and in decline, that is a sign that the desert is not well. The ecosystem relies on desert tortoises, and desert tortoises rely on the people. Now people have to be their voice.

Works Cited

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