Nature Awareness

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Question #1: Describe the customs of two or three Indo-European cultures regarding the land and natural resources, and compare and contrast these practices with the prevailing modern attitudes. *(Minimum 300 words)*

The Celts

The pre-Christian Celts saw the environment as being both exploitable and sacred. Ritual activity tended to concentrate in wild and untamed places, while much of the rest of the landscape became more and more cultivated and exploited during the course of the Iron Age. Bog bodies (bodies of people found in bogs in northern Europe), many ritually killed, were deposited in bogs and shallow pools, held down by branches or large stones. Precious objects and weaponry were deposited in lakes, rivers and bogs. Human and animal bones were ritually deposited in up to a quarter of the pits on sites in Britain, and most of the animal bones were of domestic varieties, though ravens also seemed to have been included (Green 154-155).

But there was a marked increase in cultivation and forestry management during the Iron Age. The development of the ard, a plow-like instrument that breaks up the soil (as opposed to the plow itself, which has a curved moldboard that turns the soil over) is attested in rock carvings in Sweden and France as well as ancient, broken ards found in Danish bogs (Green 177-179). In light soils this ard is quite a good plowing tool, and in heavy ones, similar ards can break up virgin soil quite effectively. The fields plowed tended to be square in shape, and the plow patterns visible to archeologists indicate that these fields were double plowed (once in one direction and again at right angles to the first) and probably had to be leveled out before seeding could be done. Unlike modern agriculture, these fields would not have had furrows. And since these iron age fields have been found on relatively poor soils, it indicates that there must have been much pressure to find workable ground, and the amount of cultivated land may have been as great as at the beginning of the 20th century (Green 181). Archeologists assume that crops were rotated, just as in modern times, with cereals alternating with legumes, since the seeds of both have been found in excavations (Green 183-184).

Grain was stored in two ways – in stone-built round pits and in small granaries put on tall posts above ground. The pits were sealed, with initial rot using up all the oxygen in the pit, thus

preventing any more spoilage, and so would have been good for long term storage. The granaries on posts probably were for short term use (Green 187).

Animals kept in the farmsteads tended to be horses (used for plowing and travel), cattle (for meat and, occasionally, milk), pigs and fowl (for meat) and sheep (for meat and wool), much like today. Houses on the continent tended to be built in rectangles (the long-house) while in Britain and Ireland the round house was the norm. Houses in Cornwall, Wales, the Cotswolds and Scotland tended to have dry-stone walls while in areas with more wood, the houses were built of wattle and daub. All tended to have thatched roofs (Green 193-194). Modern farm houses, on the other hand, are usually rectangular and divided up into rooms, unlike the ancient, one-room houses of the Iron Age.

The activities of the farming year would have depended on the season. In winter, attention would go to the woodlands for land clearance, coppicing and gathering of wood for firewood, fence posts and construction materials. Spring is the time of plowing and planting, and of lambing, kidding and calving. Summer was the time of hoeing the fields, shearing sheep and dealing with wool and the making of hay. In autumn would be harvest of crops and the gathering of leaves which were a major part of winter fodder for animals. There would have been little time for rest for farmers (Green 199-205). Nowadays, with mechanization, not all of these activities need be done, but modern farming is remarkable similar, if perhaps less work, than the farming practices of ancient times.

The Slavs

The Slavs, on the other hand, first appeared in Eastern Europe with a clear Slavic identity towards the end of the Roman era. The first written evidence of them refers to raids on the East Roman Empire during the reign of Justinian around 518 C.E. (Barford, 35). In the North European Plain there were isolated clearings separated by wide tracts of virgin forest. These areas had been inhabited by Germanic peoples who had abandoned the area in the 5th century C.E., possibly to move closer to the alluring comforts of the Roman Empire. These clearings, many becoming overgrown, are the places the Slavs colonized. In the Balkans there were extensive areas of cleared land which had also been abandoned for political reasons. This is a time of great population migration, and the Slavs were filling a vacuum (Barford, 20-21, 25).

The Slavic landscape was full of spirits and demons. Many of the spirits were from the ancestral dead and were quite helpful and beneficial. Others, however, were quite cruel and evil. Spirits were thought to inhabit objects in the home and in nature, such as rivers, springs and trees. These spirits were worshipped and cults sprang up around the objects that housed these spirits. The strong demons which inhabited flowing streams had to be placated, often by 'feeding the waters,' the act of making offerings of salt, bread or fowl in times of draught, for journeys by water, or for the

construction of bridges (Barford 190). Forest spirits, however, seem to have come into existence on their own, and were not related to the ancestral dead. The demon of the forest, the ruler of animals, was hostile to people and could appear as a wolf, owl or a whirlwind. He was often accompanied by Baba Yaga, the forest mountain-mother. Vegetation demons were especially venerated and festivals, some involving water and some fire, were enthusiastically celebrated into historic times and may have been the vestiges of an earlier, Pagan belief system (Barford 191).

Early settlements (around the 6th century C.E.) would usually have small, square sunken-floored huts with internal ovens. The floors were about half a meter to a meter below grade, and the walls were of wood and supported a pitched roof. The ovens were usually situated in a corner farthest from the door, which often meant they were on the north and coldest wall. These huts only could survive for 10 -15 years, and then would have to be abandoned due to rot (Barford 39). In Poland, however, only two examples of this type of house have been found, and there a different form existed, that of ground level buildings of the 'blockhouse' variety, similar to what we know of as log cabins or log forts from the old, western America. Bath-shaped features dug into the ground in an oval shape have been thought by some researchers to be evidence of some sort of pit-house, but others think they probably relate more to some sort of ritual activity (Barford 65).

As far as agricultural production in the Slavic areas is concerned, little is known about the sizes of fields and individual holdings, but the system of crop rotation using three fields only seems to have been introduced in the thirteen or fourteenth centuries C.E. Before then, a field would be worked to exhaustion, and then left fallow while a new field would be used. The old field would be used as pasture, gaining value from the animal excrement, and would be returned to arable use some years later. When the soil finally became completely exhausted, the settlement would move. Like the Celts, the Slavs had primitive plows, or ards, many of which seemed to have had iron tips. Iron hoes have also been found. Primary crops were millet, barley, wheat (in different concentrations, depending on where you look) and vegetable crops included onions, carrots, radishes, turnips, parsnips, cucumbers, pumpkins, cabbage and peas. Fruit trees were also cultivated and included cherries, apples, pears, plums and peaches. Walnuts were used for oil, as were flax and hemp. Unlike the Celts, however, there is little evidence that the Slavs used storage pits for their grain. Instead, they seemed to have used lofts or special granaries built for the purpose (Barford 153-156).

The Slavs also raised cattle for use as draught animals and for meat and milk, pigs for meat and small numbers of sheep and goats. Chicken remains have been found, as well as ducks and geese, but these latter may have been wild varieties. Honey and wax from bees were also collected, and used in trade. Horses were also raised, for transportation and war, but their numbers came in third after cattle and pigs (Barford 156-157).

These herds seemed to have been kept out in the open – few buildings for holding animals have been found. Also, wild animals were hunted for meat. The remains of boars (primarily), deer, hares, elk and occasionally bear have been found (though no one knows if the bears were actually eaten) and beavers were also hunted for their furs (Barford 158-159).

Until fairly modern times, the Slavic areas of eastern Europe remained quite non-mechanized. One need only recall the photos and newsreels of Nazi warplanes bombing Polish horse-drawn gun carriages in 1939 to make that clear. The coming of the Soviets and their ways to eastern Europe after the Second World War did indeed change many things, in particular with the mechanization of agriculture. However, many of the old ways still cling on. As recently as 1989 I remember seeing small wooden houses, or small *dachas*, in the wooded countryside surrounding Moscow, and some of these were indeed of the block-house variety, just as they were in the Middle Ages. Since the fall of the Berlin Wall in 1989 and the collapse of the Soviet Empire shortly thereafter, collectivization has been reversed in eastern Europe, and farmers are once again returning to private plots. However, since farm machinery was owned by the collective farms (particularly in Poland), there have been some problems with farmers becoming fully mechanized. As economic conditions improve, however, these problems should dissipate and Slavic use of the land will conform more and more to the conditions that prevail in the western part of the European Union.

Question #2: Describe your understanding of the term "nature spirits"? Discuss the concept in relation to both ancient Indo-European and modern ADF practices. *(Minimum 300 words)*

For me, the spirits of nature are those forces, powers and spirits of this mid-world in which we live, as opposed to my ancestors and the Gods. I see the world from an almost animist point of view, that every tree, rock and creature on the planet is numinous, and possesses a spirit of some form. These spirits need not be personified or even objectified, necessarily, but they exist in everything, everywhere. Once I was meditating in Sabino Canyon north of Tucson in the Catalina mountains, and I was visited by the spirit of the canyon, who appeared to me as a huge bear. This spirit might well have appeared to me as anything – I just suspect that the shape of 'bear' was a way that I could comprehend the spirit of an entire canyon full of living and non-living spirits. I also see these spirits including totem or spirit animals, those shamanic helpers and allies that I see about me while in trance and meditation.

The ancient Celts saw every part of the natural world as possessing spirit, and since these natural forces were capable of causing both good and harm, they were controlled through divination, sacrifice and other rituals. They practiced their devotions in shrines as well as in wild and other

natural places, such as rivers, lakes, springs and sacred groves. All of ancient Celtic belief assumed the presence of spirit in all parts of the world (Green 465).

The ancient Greeks deified rivers as gods and every spring had its nymph. Trees and groves often had their own dryads. When, in the *Iliad*, Zeus summons all the gods to come to Olympus, it is not just the major Gods who show up, but also all the rivers and all the nymphs. So they were worshipped quite widely. And every city worshipped its spring. Sometimes, even temples were built for a river god. Ritual offerings were routinely brought to fountain houses and animals sacrificed to rivers and springs (Burkert 174-175).

In ADF, the Order of Ritual calls for a sacrifice to be made to the Nature Spirits as one of the Kindred Offerings, when They are invited to attend the rite after the opening of the Gates to the Otherworlds. Many people, including myself, also make offerings and sacrifices to specific spirits of nature or animal totems, inviting them to ally with us and aid us in our lives and magic.

Question #3: Describe the park or patch of untended nature closest to your home and what kind of park it is. *(Minimum 100 words)*

Just east of my house is the Saguaro National Monument East. This park preserves a very large stand of saguaro cactus in its natural habitat, and is also home to many other plants and animals native to this part of Arizona. There are trails for horses and hikers all through the park, and the elevation varies from city level up to the top of the Rincon mountains.

The climate here is very dry, with temperatures up to 110 degrees in the summer and down to below freezing in the winter. We have been in a drought for the last eight years, and the effects of it are beginning to show. Many of the native plants are extremely stressed and desert mistletoe has spread to and damaged many of the native Palo Verde trees. The mountain fires of the past few years have driven many animals down to the park, and sightings of mountain lions in town have become increasingly common.

Question #4: Explain where your household water comes from; what waterway is nearest to your home, and where its source is; where it drains; if there are any large bodies of water (lakes, ocean) near your home; what you know about the quality of water in your region; and what the major concerns in your area regarding your water supply are. *(Minimum 300 words)*

There are three main sources of water for the Tucson area. First is the water pumped out of the ground, second is the water supplied by the Central Arizona Project (called the CAP) and the third is treated wastewater.

Household drinking water, at the moment, comes from ground water pumped at a number of wells in the Tucson area. This water comes from wells deep beneath central Tucson. But the water is fast disappearing.

The Central Arizona Project brings 1.5 million acre-feet of water from the Colorado River to three counties, one of which, Pima, contains the city of Tucson. This "336 mile long system of canals, tunnels, pumping plants and pipelines is…the single largest resource of renewable water supplies in the state of Arizona" ("About CAP"). This water has not been treated, and it is now being used to recharge the aquifer rather than let it go to waste ("Recharge Program – Executive Summary").

There are few rivers or waterways in Arizona that flow year round. In Tucson we have washes, which are dry waterways that only hold water when there have been heavy rains. These washes are prone to flash floods, and while normally empty, have been know to overflow and wash away buildings during flooding in the monsoon season. The nearest large wash to my house is the Pantano Wash which flows into the Rillito River (itself just a wash), and that flows into the Santa Cruz River (also a wash) and that flows into the Gila River, then to the Colorado River, and finally into the Gulf of California in Mexico. Most of the water, however, sinks into the ground or evaporates into the air before flowing very far. As recently as a century ago, before pumping of ground water lowered the water table, there would be standing pools of water in the washes, called *tanque verdes* (green tanks) which were lined with cottonwood trees and provided water for wildlife.

There are a few small lakes in the area, the nearest being Patagonia Lake near the Mexican border by Nogales, but this is actually man-made. The Grove throws its ritual silver into this lake once a year. Mostly, though, Tucson is desert country.

The ground water used for drinking is quite hard and full of minerals. It can stain fixtures and even corrode pipes. Water softeners are quite common here. The major concern with our water supplies, though, lies in availability. Developers are building homes all over the area, and the population is growing rapidly. The water table is falling at a great pace, and it is only a question of time before we have to start adding CAP water directly into the system, instead of just using it to recharge the aquifers. The last time CAP water was used directly, in the early 1990's, pipes corroded and exploded all over Tucson, causing the water to be withdrawn from the system. We will have to build state-of-the-art treatment plants at great cost to handle this water. Also, we are in the eighth year

of draught in the west, and Colorado River levels have fallen. There could be a water crunch in Tucson before the end of this century.

Question #5: Explain where your household garbage ends up and what recycling is available in your area? *(Minimum 100 words)*

Here in the Tucson area, our household garbage is taken to the Los Reales Landfill south of Interstate 10 near Craycroft Road ("Landfill"). There have been other landfills in the county, but they have been closed and are lying fallow at the moment.

Household recycling, however, is alive and well in Tucson. Residents have recyclable items picked up curbside, some businesses, and those who live outside the city limits with commercial dumpsters, can take their recyclable items to one of sixteen neighborhood recycling centers. The materials collected by the city from the blue recycling barrels in front of each home or from the recycling centers are sent to Waste Management Recycle America, a local recycling center. From there, the materials are sold to a variety of businesses in Tucson and around the country. Last year, the recyclables had a market value of over $70 a ton, and the city made around $1 million (tucsonrecycles.org).

Question #6: Briefly explain the major sources of air and water pollution in your area, what the biggest source of pollution in your area is, and what impact it has. *(Minimum 100 words)*

The three main types of air pollution in the Tucson area are ozone, carbon monoxide and particulate matter. Both ozone and carbon monoxide come from vehicle exhaust, factories and gas stations. In addition, carbon monoxide is caused by power plants and wildfires. Ozone is created when the ingredients, volatile organic compounds, nitrogen oxide and nitrogen dioxide cook in our heat and sunlight. In our hot and sunny climate here, this can be a real problem. Ozone can cause severe respiratory symptoms and impaired breathing. Carbon monoxide cuts down on the blood's ability to deliver oxygen, and high concentrations in the air can be bad for cardiovascular health. Particulate matter is the stuff just floating in the air, like smoke, dirt and dust, mold, spores, and pollen. These are caused by fires, dust and dirt from roads and farms and the crushing of rocks and soil. Even our Grove Fire is a contributor to this (Air Info Now).

There is a plume of trichloroethylene (TCE) spreading through the aquifer in a northwest direction from the airport in Tucson, which was discovered in 1981 when an unusual cluster of health problems showed up just west of the airport. This water pollution was caused by aircraft companies that have since gone out of business, but Raytheon built a treatment facility to handle the water

beneath their plant. The water is treated and then blended with other water before distribution in the city's water system. The plume, however, has forced the city to abandon some of its wells that became affected. In 1995, voters approved the Water Consumers Protection Act which limited the use of this treated water, but Tucson Water must continue using it anyway due to its binding agreement with the EPA ("Chapter Six").

Question #7: Describe the basic climate of your region, the primary influences on your weather patterns, major economic resources of your region (for example, crops, minerals, ranching, tourism, manufacturing) and how are these affected by climate and weather conditions. *(Minimum 300 words)*

Tucson is in the northern end of the Sonoran Desert, and we are a desert for a number of reasons. We are fairly low in altitude (2548' at the airport) with grasslands and then forests only beginning at higher altitudes; the large bodies of water from which precipitation could come (the Pacific Ocean and Gulf of Mexico) are relatively far away, with most of our moisture coming from the Gulf of California; the Pacific is cold, so less water evaporates from it up into the atmosphere; and we are in a double rain shadow. Moisture from the Pacific is blocked by the north-south mountain ranges of California and moisture from the Gulf of Mexico is blocked by the Rocky Mountains and the Sierra Madre Mountains ("Tucson's Climate").

We also have five (5) seasons in Tucson. Spring comes in late February through April, and this is when many of our plants bloom. This is followed by Dry Summer in May – June, when it can get extremely hot during the day, but the nights can still be cool. The saguaro cactus blooms at this time. This is followed by our Monsoon Summer in late June through early September. We officially enter Monsoon when we have three consecutive days of a mean surface dew point of 55 degrees F. or better. The days can start out clear and sunny, but thunderstorms can build in the afternoons bringing much needed rain. This season is followed by Fall in late September through November. The nights cool off as humidity drops, and freezing night-time temperatures are possible. The final season is our Winter from December through early February, with daytime temperatures in the 60's and night-time temperatures in the 30's and 40's. Winter rains can come, and are very welcome ("Tucson's Five Seasons").

Southern Arizona has a number of economic resources, with tourism accounting for about 12% of the economy. Our warm climate in the winter brings in plenty of "snowbirds", people who are fleeing the winters up north in search of warmer weather. The University of Arizona also accounts for about 12% of the economy, and the high-tech sector is roughly the same ("Tourism a Bedrock"). In fact, we have over 1200 high-tech cluster companies which employ over 50,000 people, bringing in annual revenues greater than $6 billion ("Southern Arizona's High-Tech Connection"). Another

major economic resource is farming (cotton, fruit and nuts and vegetables), which does well here due to the warm climate (though since we are cooler than central Arizona, we can grow upland cotton) but it is also threatened by residential development ("Cotton Is Fading").

Question #8: Name and provide the following information for each of three species of animals (birds, mammals, insects, fish, etc.) and three species of plants native to and currently found in your area:

- ***a. Its status (endangered, threatened, thriving, overpopulated)***
- ***b. A brief physical description of the species, noting if you have seen it, and where.***
- ***c. Describe at least one of the following:***
  - ***i. a way it is or has been used by humans (for example, as food source, medicinal use, raw materials for tools, clothing, housing, etc.)***
  - ***ii. a way in which it has been affected by human presence or development***
  - ***iii. a way in which it has adapted to or entered into an ecological relationship with human presence or human development.***

<u>Coyotes</u>

a. Coyotes are common all over Arizona, in both rural and urban areas. They are thriving here.

b. Biological name: Canis latrans. I have seen many coyotes around my home. They are usually grey, with a rusty color on their necks and flanks, and have a black color at the tips of their tails. They usually weigh 20-40 pounds, stand 18-21 inches tall and are 42-50 inches long ("Living with Coyotes"). They have a mournful call which can usually be heard at night. When chasing prey, a pack of coyotes can make a tremendous and eerie noise.

iii. Coyotes have easily adapted to life in urban and suburban areas. There are plentiful water sources, from sprinklers to swimming pools, and garbage, pet food and bird feeders provide food for their prey, such as rabbits and quail. Coyotes can be seen in large numbers on the edge of any city in the state.

<u>Bobcats</u>

a. Bobcats are common all over Arizona, at all altitudes, and especially in chaparral areas (thickets of shrubs and bushes) as well as on the edges of cities. They are thriving here.

b. I have only seen a bobcat once, sitting on the wall just outside the room where the Grove meets each Saturday morning. I remember being surprised at how small it was. Bobcats are tan colored with spots on their sides, with a short tail which has a

black spot on the top side. They weigh 15-35 pounds (with males being larger than females), stand 18-24 inches tall and are 24-48 inches long ("Living with Bobcats"). They can be found in backyards which have abundant wildlife and may have kittens in the bushes.

iii. Like the coyote, bobcats have adapted well to the food and water opportunities that modern suburban life can offer. They rarely attack humans (and then only when rabid) and so are tolerated by many, unless there are small pets around. Bobcats eat birds, rabbits, unattended pets, rodents, etc., and drink from fountains, pools, etc.

Gambel's Quail

a. Gambel's quail are thriving in the deserts of Arizona, and their range extends down to Mexico, west to California, east to Texas and north to the southern parts of Nevada, Utah and Colorado (Thomson).

b. These small birds weigh about 200 grams and are about 11" long. They have chunky round bodies with plumes on their heads. The males have dark plumes, a black face and neck and a black spot on the chest. Females are plainer, with paler and more slender plumes, and do not have the dark markings. Both have brown sides and olive wings (Thomson). We have hundreds of them in the wash south of our house. I see them there every morning at feeding time and also out my office window below the finch feeders in the afternoons.

i. Gambel's quail are considered game birds, and the season on them opened on November 18, and 15 quail may be taken per day, up to a total of 30 quail. Southern Arizona did not get the rainfall in 2005 that the rest of the state did, so hunting this season might be difficult ("2005 Small Game Outlook").

Saguaro Cactus

a. While the Saguaro cactus may be said to be thriving in general, it has a very small range (parts of Arizona and Sonora) and threats to its habitat, by ranching, theft and developers (Hodge 9), have led the state of Arizona to pass laws protecting saguaros in the wild. They may not be touched on public land, and they may not be moved without a permit.

b. Saguaros are very large cacti that can grow up to 40 feet high or more. They are leafless and spiny, and have a waxy, green skin that retards moisture loss and permits expansion when it soaks up moisture from the ground during rainstorms. They appear like huge columns, and often grow one or more arms. In the spring, white flowers bloom at the top of the plant, and fruits appear later in the summer. Saguaros can only reproduce in places where there is some moisture and shade – often in the shade of a plant referred to as a "nurse tree" or "nurse plant". Some places where they currently thrive are now too dry for propagation (Hodge 5).

i. After the age of about 30, the average adult saguaro can produce about 100 fruits per year (Hodge 35), and in prehistoric times, Native Americans, such as the Tohono O'odham, relied on the plant for food. The fruit would be turned into seed flour, jam and syrup, and a wine was also made from the fruit which was the occasion of a festival. This fruit came at a time when there was little else to eat other than the beans of the mesquite tree and wild game. Modern tribes still use the fruit seeds for feeding chickens (Hodge 47-48).

Mesquite

a. The mesquite is a thriving shrub/tree of the desert southwest in the Sonoran, Mojave and Chihuahuan deserts, covering Arizona, New Mexico and northern Mexico, primarily.

b. The mesquite is deciduous and can be either a shrub or small tree, up to 20 feet tall with trunks up to 8 inches around. It has narrow bipinnately compound leaves and may have thorns. The tree has yellow flowers in the spring and its fruit is a bean pod up to 8 inches long ("Mesquite"). We have many mesquites growing on our property, and there is one just outside my office window where I can see it as I write.

i. Native Americans used the bean pod to make tea, syrup and a kind of flour named *pinole*. This flour is sweet, and has recently been discovered to control blood sugar levels in people with diabetes. The honey from mesquite flowers is quite aromatic. The Native Americans also used the bark to make baskets, fabrics and medicine. The wood of the tree makes excellent firewood because it burns slowly without smoke ("Mesquite").

Desert Marigold

a. The Desert Marigold is quite common in the desert southwest, blooming in the spring and growing in vast, yellow carpets of color. They are quite abundant on roadsides and their range is from northern Mexico up to southern Utah, and from the Mojave desert in the west all the way to Texas in the east ("Desert-Marigold").

b. Desert Marigolds are annual flowering plants (or short lived perennials) that grow up to 30 inches long and bloom in the spring with yellow flowers that can grow up to a foot above the leaves. They have grey-green foliage and can grow in masses when there is enough water. They often grow on stony slopes or sandy mesas, as well as along roadsides ("Desert-Marigold"). They spread by seed and, if conditions are right, can spread quite quickly.

i. While the Desert Marigold has been fatal to sheep on overgrazed land (horses and cattle don't seem to be affected), there has recently been work done by the University of Arizona to extract certain compounds from the plant (fastiglin, baileyolin, and radiatin) which have the potential to fight cancer by inhibiting the growth of cancer cells ("Desert-Marigold").

Question #9: Identify one species of plant or animal in your local area which is threatened, endangered, or locally endangered, or which became extinct in historic times. Explain what destroyed or threatens this species locally, how does or might the absence of this species affect your locality, and what, if any, steps were taken or are being taken to preserve the species. *(Minimum 100 words)*

The pygmy owl, only 7 inches in length, was listed as endangered in Arizona by the US Fish and Wildlife Service back in 1997. This decision caused a firestorm of opposition from local developers who thought that this would significantly raise the cost of new-home building here. As of March, 2005, there were only 20 birds left in Arizona (Kenworthy). Pima County, in an effort to protect the pygmy owl and 54 other kinds of plants and animals, proposed a bond issue of $174 million in bonds to raise money to buy land and preserve open space. It is loss of habitat that is threatening the pygmy owl. This bond issue passed and is now being implemented. The loss the pygmy owl would not be catastrophic for the bird as there are large populations in Mexico, but it would mark the end of the bird here, where it once ranged widely. On August 2, 2005, however, the US Fish and Wildlife service took the first steps to have the pygmy owl taken off the endangered species list, even though the owl population has not increased. Environmentalists are horrified and are protesting the decision. Removal of the bird from the list, however, would not mean wholesale development in nesting areas, due to the new local restrictions and open-space purchases in Pima county (Davis and Tobin).

Question #10: Identify one plant or animal species which was introduced to your area and explain how its introduction and continued presence has affected the local ecology and what, if any, steps are being taken to mitigate those effects. *(Minimum 100 words)*

Buffelgrass is a type of grass that was brought into Arizona and carefully tended to make feed for cattle. Along with five other species of grass, this plant has invaded the desert and there are stands of it along every highway coming into and out of Tucson. This grass not only takes up valuable moisture from the land, parching and killing native mesquite, palo verde and saguaro plants, but it also has become an incredible fire hazard, bringing flames to the desert floor where there have been none for over 10,000 years. In Green Valley, just south of Tucson, buffelgrass was planted to stabilize mine tailings, and this grass burned in the spring of 2005. The speed that these grass fires spread also create dangerous situations for firefighters (Copenhaver).

The University of Arizona, in March of 2005, began a series of classes for volunteers to learn how to recognize and destroy buffelgrass around Tucson and Phoenix. Infestations along roadways and suburban areas were targeted as they are the chief places from which the grass spreads into the surrounding countryside. The two primary methods of eradication are the use of rock picks and

herbicides. The idea was so popular that the University had to ask volunteers to reserve a spot in advance for the class ("Scientists").

Question #11: Based on your experiences, meditations, and research, describe what, in your opinion, makes a place seem "natural." *(Minimum 100 words)*

Before I started meditating, I thought that for a place to be natural, it had to be pristine and untouched by human hand. Indeed, such wild places are natural and can be full of power. The ancients sought out such magical places for their rites and worship rather than use the mundane space of the local village or fields.

But what does the word, natural, mean? I think it is more than just what existed before man. I think it includes man as well. For man is a part of the natural order, despite what he may think! Having said this, I do believe it possible that man can make a space sterile, or so full of human vibrations that the rest of the natural world is drowned out in the din. But man can also create 'natural' space.

Since I started regular meditation I now see that untouched, pristine existence is only part of the story. There is a current of power, of *anima*, in everything, for all things have spirit (or spirits), including man. The stone circle I built has the spirits of the stone I used, as well as the Sacred Tree (an oak) and the Fire and water of the Well. When I listen closely, I can feel their presences. This site is used for ritual on at least a weekly basis, and the power, love and devotion of the people celebrating and attending the rites have also permeated the space, giving it a connection to the Kindreds, the Three Worlds and the Three Realms. This man-altered space is now as natural as the desert land that preceded it.

Question #12: Based on your research for Questions 1 above, describe what sort of offering would be appropriate to make to the Nature Spirits in your area, and what would be an appropriate way to make such an offering and why. Discuss the potential ecological consequences of making this offering and ways to modify the offering in order to minimize any negative environmental impact. *(Minimum 100 words)*

Here in the desert, the living things, plant, insect and animal, need water to live. Water can be quite scarce. An offering of water would always be appreciated. Water poured over the roots of a plant would have the least harmful consequences, for putting water or food out for the animals on a regular basis could lead them to expect it, and would draw more wild animals to the home. There is also concern about feeding wild animals, both from the standpoint of dependence as well as bringing wild animals in close contact with humans, which is rarely beneficial for either and can also be

dangerous. Feeding birds seems to be much more acceptable, as small birds only seem to attract raptors as a rule, which rarely cause problems for people (though small pets could be affected). As a result, our Grove tends to offer bird seed in ritual.

The Native Americans offer bits of tobacco to the land and this is also acceptable, as small amounts are of little interest to wildlife. Tobacco may be too aromatic to appeal as a food source.

Question #13: Based on the research and conclusions you have drawn from question 1 through 12, describe how you might further extend your personal and/or group spiritual practices to include the Nature Spirits and other natural elements. *(Minimum 300 words)*

I think it would be highly appropriate to begin consciously adding offerings of water to the Spirits of Nature in our Grove rituals and in my personal rites. Currently, any unused offerings (like the left-over Waters from the Return Flow part of the rite) go to the Earth Mother. But I have long felt that that we, as a Grove, have not really connected well with the Nature Spirits. Currently, we throw bird seed out of the circle during the invocation, and occasionally hang a 'shiny pretty' in the World Tree. I would now like to add a consecration of water, including the addition of a drop of our Holy Water, and then a short procession to the Nature Spirits altar where the water can be poured out on the trees there. This could be done in addition to the bird seed and trinkets.

For my personal practice I do a number of things currently. I feed the finches, doves, quail and cactus wrens with bird feeders outside my office window and spread bird seed (and the remains of our macaw's seed) each day in the wash for the quail. I realize that this only makes them think that it will always be there, but the predation of the flocks in the last few years has been so great, what with the draught, that I think feeding them so that their numbers can increase is a good thing. There have been far more birds surviving into adulthood here since we began feeding them.

I also offer to the house spirits in my personal work, as I usually do these rites indoors. For them, I offer a fruit, such as an apple or orange. I let it sit on my altar for a week so that the spirits can take of it what they like, and then replace it with a new fruit at my next rite. The old fruit is then thrown out into the wild.

Once more, I'd like to now add water for the spirits of the house and nature in my personal work. This will require taking a walk out to some place where I can pour it, or I can consecrate and offer it in the rite, and actually deliver it to the land afterwards.

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