Background Reading

Throughout our everyday lives we are bombarded with environmental jargon like balance of nature, the fragile planet, and an environmentally sensitive area. We're taught the *biosphere* is in perfect harmony and that life clings to special relationships that it has with the environment. Any change in the relationship with the environment results in drastic repercussions that echoed down through all life.

But life is not fragile. Life is very strong and has a tremendous ability to overcome adversity. For example: ever consider how many times we have tried to eliminate the common housefly. In the late 1940's and early 1950's, before the discovery of a vaccine procedure, an epidemic of *polio* would spread across the United States every summer, causing death and leaving thousands of people crippled or incapacitated.

In a consorted effort by hundreds of agencies throughout the country, *DDT* was used to control the housefly population, which was the suspected *carrier* of the disease. They sprayed everything. Giant sprayers went up and down streets and alleys spraying death upon any organism living there. Everything was sprayed - farms, homes, stores, and even people were given a dose for good measure. Some scientists believe that 97 percent of the total population of houseflies in the United States was eliminated during that four or five year period. Did it work? For a short time it did. Do we have houseflies around today?

The only thing accomplished by the reckless use of DDT was to create a *strain* of flies that were not only resistance to that particular insecticide, but they had become *immune* to over 50 commonly used chemicals. We created a super fly that was actually able to survive a dose of DDT that would kill a human. Life is not fragile. It is tough. It's tough because it has the ability to change and to adapt.

So what is with an environmentally sensitive area? Does the use of such terms implied that living environments are weak? What we must understand is that even though life is strong, the type of environment that is advantageous to all living things is fragile.

In any environmental area, all species present depend upon one another for survival. The *food chains* and the larger *food webs* together with the physical resources available keep each population from getting too large or too small. These feedback systems work as long as nothing changes.

Change will create an advantage for some populations and a disadvantage for others. The result is a creation of a new *ecosystem*, different than before with the degree of difference being related to how much change was forced upon the original environment. Species must either change (*adapt*) or be eliminated.

What happens to the species that occupied areas that are so drastically changed that the species fail to adapt and become *extinct*. This is another example of why life is not fragile. The answer is that something will move into the abandoned area that biologists call an *ecological niche*. It seems we can always find some form of life that has the right genetic makeup to fit the new environment. Even the harshest of environments always seem to have living creatures there.

Why should we worry about the environment if life is always going to be there? When scientists speak of fragility and sensitivity and they are concerned with changing environments, it is not because they are worried about the continuation of life; instead, they are worried about human life - you and me. Change would affect our survival ability.

Environmental concerns are not manufactured concerns aimed at restricting progress so that we can keep things the way they were. They are real concerns that affect the quality of human life and will eventually affect our survival.

Most organisms live within a very restricted ecological niche and thus are only affected by what changes will occur locally, but some organisms may live in several niches that are more widespread. Certain types of bacteria have the ability to live in a hot springs. Their environment is very restricted and their concerns are focused upon the condition of the spring. Elk, on the other hand, may use the area surrounding this spring in the winter because the heat that is generated keeps the snow-cover down and grasses are exposed for food. In the summer, the elk leave the springs and move to the large open areas of the valley which have plenty of grass to use as a food source. You can see that a change in either the hot springs or in the grasses of the valley could have effects on the population density of the elk. If the valley underwent some prolonged drought, the elk would be forced to find an alternative food source or risk not surviving. Under these conditions the bacteria in its restricted niche is unaffected by what happens to the grasses in the valley. The more environments used by an organism, the more complicated the life.

What organism inhabits the most environments? It's not hard to figure out. Humans are global. We have spread to all areas of the planet and we can at some time be found in all environments. We have been to all places on the surface of the earth, to the bottom of the deepest oceans, and some have even left the planet and gone to the moon. We are part of every environment and because of this we are dependent upon the earth as a whole.

There is no doubt that the evolution of the human brain has given us a great advantage in adapting to all environments. New technologies continue to give us ways of being comfortable and increasing our quality of life. It has given us a false sense of security, because we have overlooked the impact that all of these advances have had on the earth.

In the last 200 years the human population has grown *exponentially* and is presently estimated to be in excess of 6 billion people. We are accumulating

new individuals at a very conservative estimate that exceeds 50,000 people per day. The presence of all these people place tremendous strain on technologies and resources. Over-population was something that was predicted a long time ago.

In 1972, A Buzzati-Traverso, the Assistant Director-General of UNESCO wrote in the foreword of the book *Planet in Peril*:

> "Unreflecting optimists will say that migration will bring New land into use, that new technologies will make old land more productive and that science will discover new resources, new methods, and even new synthetic sources for manufacturing food. That may be so. But even if it works so, it would not change the essential issue, but merely alter the time at which it will become acute. The final and inescapable fact is that resources are limited, in the last resort, by the space on the land's surface. On the other hand, the human multiplicative faculty continues to exert itself, and the absolute increase of population, though already greater than at any previous time, is still showing acceleration. Somehow or other population must be balanced against resources or civilization will perish. War is less grave and less inevitable threat to civilization than is population increase. "

In summary, species have the greatest chance of survival in environments that are not changing. Change is the initiator of *evolution*, because change will create an advantage for a particular population. Organisms fit into environmental niches. The more niches an organism fills, the greater the concern for the preservation of its environment. Humans are global, not only in number, but in the use of all environments. Their survival depends upon how much they modify their environments or how much the environment makes them adapt..
So what's the concern about the environment? If humans are able to adapt to many environments then why be alarmed about the destruction of a few. The reason is tied to an increasing population. A larger population means a greater use of resources and this creates a more destructive impact on various environments. Small populations can simply move when impacts are too great, but with human populations nearing capacity there is no place to move.

Even if we could move, human industries have the ability to reach out thousands of miles to cause harm. A factory along the western shore of Lake Michigan can release *sulfur dioxide (SO_2)* into the air and cause *acid rain* to fall over a 1000 miles away in Upper New York State or even in Quebec. The fertilizer on a field in Iowa can alter the fishing industry in the Gulf of Mexico. We are not a local species anymore.

Some environments are more important to survival than others. They are areas that are on the brink of breaking down and creating severe problems for humanity. They are called **environmentally sensitive**, not because they are delicate and easily hurt, but because they have been pushed to the limit of their ability to function in a way that is beneficial to humans. Increases in harmful activities may push them beyond recovery.

An environmentally sensitive area is a special ecosystem that functions in its present condition to help maintain a large population of humans. Failure of this system would cause severe stress on our chances of survival. Its loss would mean that once again humans would have to replace it with an artificial system, something we may or may not be able to do.

The cameras of World Web Wonders are presently placed in five environmentally sensitive areas in Florida. Each one of the areas is unique and its destruction would have its own affect on humans. In subsequent lessons, we will study each area individually to understand how they work and how they benefit humans.