

# Recreational Leadership Training Course



**-- RLTC --**

*Leading Volunteers to Victory!*

**By Del Albright**

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**MODULE IX:**

**Environmental Science for Trail Work**

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MODULE IX:  
Environmental Science for Trail Work

-- INTRODUCTION --

Welcome to Module IX: Environmental Science for Trail Work, of the Recreational Leadership Training Course (RLTC), by Del Albright. RLTC is designed to help you be a better boss of volunteers in recreational endeavors, such as trail projects, events, cleanups, conventions, and meetings.

RLTC is a 10 Module correspondence course conducted via email and the Internet. Each Module must be completed in order, before starting the next Module. An examination is part of each Module. Complete the examination and mail (hard copy, signed) to:

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Questions and comments may be exchanged via email as you progress through the course. Or you may call me at: (209) 304-7693.

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Module IX is about understanding a few key components of environmental science and how it affects trail work for motorized recreation.

## - Ecosystem Management -



To be an effective recreational trail leader who promotes land stewardship, you must understand the “big picture.” You must be able to help other volunteers understand how one project fits into the big picture. When everyone sees how all the pieces fit together, it is much easier to stay motivated in an isolated project. It is also much easier to stay focused on a strategic purpose when you know the big picture.

Ecosystem management is a term that describes the big picture. Webster defines ecosystem as a system made up of a community of animals, plants, and bacteria interrelated together with its physical and chemical environment. One definition of management is the act, art, or manner of managing, or handling, controlling or directing.



So ecosystem management is the art, act (add science) of handling or controlling our interrelated communities of man and nature. In simplest terms it means managing the big picture with all the pieces taken into account.

Let's look at some examples.

Logging: When a tree is cut in the forest, several things change. Shade levels on the forest floor decrease. Openings increase. Habitat for tree-dwelling birds diminishes. Forest duff and litter may increase. Fire

hazard could be increased or reduced. Oxygen levels may decrease. Wood supply increases. More homes can be built. People have jobs.

Snags, such as the one in this photo, can be left behind to become wildlife (bird) habitat. Or they can be felled to eliminate a future fire hazard.

Road Building: When new roads are built, several things can change. Access is improved. Fire suppression capabilities are increased. Fire hazard is reduced. Hunting opportunities may be enhanced or diminished. Land acreage for wildlife habitat is diminished. Erosion and riparian sedimentation may increase or decrease. People have jobs. Lands can be better managed with improved roaded access. “Wilderness” values are diminished.

Trail Projects: When you do something to your trail, other things are impacted. Newly constructed water bars disperse water onto areas it has not been before. Ditching alongside a trail carries water in a larger volume to new areas. Forest duff layers change. Wildlife habitat could be modified. Sound levels may increase. Riparian disturbance could be increased or decreased depending on trail design. Depending on use levels, wildlife may be displaced. User access is improved. Agency relationships are enhanced. Volunteers who work on their trail have increased chances for grant dollars.

Grazing: Livestock grazing changes the landscape in some cases. Fire hazard can be reduced. Grass stubble length can be managed. Riparian habitat can be damaged. Stream banks can be modified over time. Forest health overall can be improved with reduction of brush and unwanted plant species. People have jobs and food at reasonable prices when grazing is allowed. Some grazing allotments are perceived as mis-use of public lands and cause controversy. Some lands that had grazing, then lost grazing allotments are now extreme fire hazards and unmanaged dog-hair thickets.

There are several messages in these examples. First, the ecosystem is a big puzzle, and every piece fits together to make the puzzle. Second, everything in nature has a niche – their place in the world. Third, like dominoes standing in a row, if you knock one over, you might cause the whole row to tumble. The ecosystem needs to be managed in individual components, while still considering the whole big picture. Fourth, ecosystem changes can be mitigated to give us tradeoffs when making changes to one piece of the puzzle. The big picture is a beautiful one when it all comes together.



Mitigation is a commonly used term these days for property developers all over the country. When they build a subdivision in an area containing certain species or habitat concerns, the developer quite often has to buy other properties and set them aside as mitigation for the project. Greenbelts are another form of mitigation for loss of wildlife habitat.

Everything affects everything else in some way. It's all about the big picture of nature and humans. Sometimes we need to consider the affect of all these things coming together on one project. We call this the cumulative effect.

### **- Cumulative Impacts -**

As we make changes to the pieces of our puzzle, soon the effect compounds itself. This is called the cumulative impact. For example, if a trail goes without maintenance, erosion levels may increase over several seasons. Increased erosion will wash more sediment into nearby watersheds. If a fire or logging operation opens up more of the forest in the same watershed, then this may allow more water runoff. This runoff combines with the runoff from the unmaintained trail to make a cumulative sedimentation load – a cumulative impact. It adds up.

Obviously these impacts can be easily mitigated and managed by sound science and reasonable management. Good land managers understand this and through their planning process can allow for the type of management and maintenance that prevents unnecessary cumulative impacts.

A recreational leader who is also a land steward takes the big picture into account and asks what the cumulative impact might be of a project. These impacts are then explained and shared with project volunteers. The more people that understand how everything fits together, the more likely they will continue to “do the right thing.”

Cumulative impact can also be defined in terms of modifying your recreational toy. If you upgrade one component of a system (such as a drive train), then you’ve probably created a weak point elsewhere in the system. As you continue to upgrade individual parts and pieces, sooner or later the cumulative impact of this selective upgrading and strengthening will surface as a weak point that you’ve yet to upgrade!

When evaluating a trail project for your club, it’s important to understand how it fits in with the big picture and what the cumulative impacts might be. By explaining this to your fellow volunteers, you increase your chances of gaining more committed involvement. You also minimize the misunderstandings and rumors that might detract from the overall good of your project.

When it comes to wildlife and plants, you know that in nature, not all things are uniform in their occurrence. Certain species are abundant in certain habitats and some are limited to specific areas, within which there could be further restrictions on the essentials needed for life. As volunteers working on our trails, it helps to understand this.

The distribution of plants and animals are controlled by habitat, as well as annual rain fall, seasonal temperature patterns and other climatic factors. A good public land management wildlife biologist can explain this and how it relates to your trail projects.

Naturally, we can rely on public land manager wildlife and plant biologists to help us when it comes to developing trail networks. But sometimes it helps just to know that for every action, there is a reaction. Many, if not all of these actions and reactions can be managed with good science and good

sense. This is where we have to be involved. Not always does good science prevail. Sometimes politics gets in the way.

In nature, there is constant change in order to achieve balance. Nature is always trying to find balance and offset changes. Drought years are eventually compensated for by floods. Hot summers are contrasted by wet winters. It's a continuing cycle of change.

What we can do, as humans living with nature, is to constantly reassess what we are doing to nature. Our population expands every year. Our resource base is fairly fixed until we find new resources. On the other hand, many of our resources are renewable – especially when sound science is allowed to work.

The demand for outdoor recreation increases every year. We need to ask what is our cumulative impact and how can we work with it? The common sense solution to managing our eco-system and cumulative impacts is five fold:

1. Learn about eco-system management and cumulative impacts in your local recreation areas.
2. Be actively involved in public Scoping sessions and input workshops conducted by our land management agencies in your area. Present the recreational perspective that is geared towards continuing our access.
3. Educate other volunteers in the big picture.
4. Be willing to mitigate impacts in your trail projects and events.
5. Be proactive in planning your trail projects and events and take into consideration any cumulative impacts and eco-system management issues. Get ahead of the issues before they become an issue.

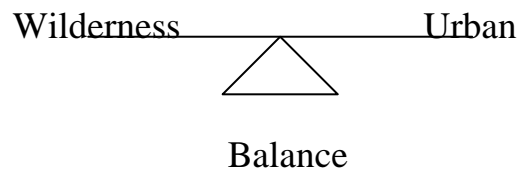
People will continue to need resources derived from activities such as mining, grazing, and logging. People will also continue to need more recreational opportunities to compensate for the stress of daily life. People will also continue to build houses in the rural areas where many of us have recreated in the past. Humans are an integral part of Nature and we must find ways to work in harmony.

Land managers are obligated to manage the entire picture – humans and nature. They must also balance the Recreational Opportunity Spectrum (ROS) where man and nature mix.

## - Recreational Opportunity Spectrum (ROS) –

The first thing to understand about roads and trails on USFS lands is the **Recreation Opportunity Spectrum (ROS)**. ROS is the **land classification** system the USFS uses to describe the type and character of the recreation opportunities on Forest lands. You may find terms like Urban, Rural, Roded Modified, Roded Natural, Semi-primitive Motorized, Semi-primitive Non-Motorized, and Primitive coming from the ROS classification.

Think of ROS as a teeter-totter board, with a balance point (Fig. 1). On the far left is severe restriction (hiking only); and on the far right is development (urban setting). Depending on where the center of gravity (ROS designation) pushes down, the board teeters one way or the other; hopefully finding balance overall in the long term.



*Fig. 1. A Visualization of the Recreation Opportunity Spectrum*

Unfortunately (depending on your point of view), the center of gravity is pushed one way or the other, NOT by sound science and legitimate public input, but rather by special interest groups and politics. Sometimes it goes the way of motorized recreation. But more often these days, it goes the way of closures and restrictions.

The National Park Service (NPS) and Bureau of Land Management (BLM) have land designations of their own; separate from the USDA Forest Service (USFS). On the other hand, some terms overlap all three agencies. We will explore these terms in depth in Module X. But for now, it's important to understand that land management agencies are always trying to find balance, while at the same time meeting the mandates of their agency mission. It's not an easy game to play. The rules are stringent, and many times change in mid stream. Staying involved is how we deal with this and how we stay on top of our issues and concerns.

## - Endangered Species Act -

The Endangered Species Act (ESA) has more influence over our country than you can ever imagine. It dictates a lot of what we do in the way of recreation, trail building, housing, and resource extraction and use. As a leader of volunteers, you need a basic understanding of the ESA and how it fits in the big picture.

Please indulge me as I tell you a story about the ESA. This is about the times when fisherman caught real fish!

*“Sixty feet under the warm Mexican waters off the coast of San Felipe, the giant creature swam effortlessly, constantly on the prowl for food. Weighing a hundred pounds, he could pretty much eat anything he wanted, so when he saw the Corvina rock fish dangling in his path, not trying to escape, the monster went in for the kill.*

*On the surface, lulled by the tropical sun, I drifted in and out of a sleepy state as our old boat drifted lazily with the Baja current. The smell of salt air was strong, but the wind was light. We used parachute cord hand-line for fishing in these Mexican waters because the fish were so big, rods and reels were just too slow on the retrieve for meat fishing. I came suddenly awake when the hand-held fishing line began to tighten in my gloved hands.*

*Strung over my knee, down under my foot, then over the boat gunnels, the hand-line set up was designed to transmit the fight of a fish throughout the lower half of my body. Immediately there was no doubt that I had a big fish on the line. My gloves began to smoke as the line streamed out to sea. I tugged back with all my strength and began to haul the line in hand over hand. I pushed down with my shoe on the hand-line to increase the tension against the big guy on the other end.*

*“Old Redwing,” our sixteen foot, fiberglass over wood boat, started moving faster than the ocean current as the big monster pulled me and the boat along. Red Wing got her name from the red wind wings that came off the windshield, on what otherwise was a white boat. I remember that it didn’t seem like much of boat in that large ocean.*

*Thirty minutes later, with a little help from my Dad, I had the monster up to the boat. It was right at one hundreds pounds. Not bad for a sixteen year old kid!*



*Today, when I think back nearly forty years to that fishing trip, I have mixed memories. The fish was called a Tutouva, a relative of the White Sea Bass. They no longer exist. They're gone. At least the big boys are gone. They were fished out to extinction. Commercial fishermen were using everything from dynamite to nets to catch these Mexican monsters. But it was a time I will always remember and cherish."*

Now the big fish are a learning lesson for me. It makes me shake my head over their loss. It almost makes me wish there had been something like the Endangered Species Act (ESA) back then. But the ESA *really* makes me shake my head. This is a two-headed serpent.

Had there been some sort of International ESA, maybe the Tutouva would still be swimming in the Sea of Cortez. But then again, if you look at today's ESA, you see how ludicrous the current form of the Act really is. Today's ESA is in bad need of reform.

Today's ESA puts third generation ranchers off their land and out of their home. Today's ESA cuts off water to hundreds of farms over some obscure sucker fish that no one likes, eats or cares about, nor has any impact, whatsoever, on the ecosystem.. Today's ESA puts the livelihood of an invisible gnat over the needs of people and homes. The list goes on. The ESA needs reform.

We need a version of the ESA to keep wonderful critters like the Tutouva from going the way of Klamath farmers or Old Red Wing (who went to the boat grave yard years ago). But we do not need a piece of legislation that completely lacks common sense.

In fact, if we can find some political candidates who run on a platform of common sense, then I say we get behind them and support them whole heartedly. Further, I would hope that these same candidates (or existing politicians) would put some common sense back in the ESA.

Dad and I were catching Tutouva back in the 60's by launching old Red Wing through the surf on a completely undeveloped and nearly deserted beach right outside San Felipe. Now, as you can guess, there is a lot of development and boat docks – but less fishing.

It's the way things go today. It's called growth and change....progress We just need to manage this growth. But we must put common sense back in politics and government. Part of that common sense is reforming the ESA.

## Endangered Species Act

### **The History of Reform**

(Borrowed with permission from Crowley Off-Road and the Grassroots ESA Coalition)

President Nixon signed the Endangered Species Act (ESA) into law in December of 1973. The bill passed the Senate by voice vote and the House of Representatives by a vote of 355 to 4. Although the ESA's overall framework has remained unchanged since 1973, significant amendments were adopted during 1978, 1982 and 1988. In 1978, the definition of species was modified to limit the listing of populations to vertebrate animals, and in 1982, listing decisions were required to be based solely on biological and

trade information without considering economic or other effects, and provision was made for the designation of "experimental" populations that could be subject to lessened protection. Public notice and reporting requirements were added in 1988 amendments ([Endangered Species Act History](#)).

The original ESA, like many laws, contained a provision requiring it to be "reauthorized" every 5 years. This was to give any future Congress an automatic opportunity to revise it if they so desired. However, **the ESA remains in full effect even if it is not reauthorized** - as long as Congress continues to appropriate money for their operations.

Although the ESA was due for reauthorization in 1993, no legislation has yet been enacted.

The ESA has been reauthorized and amended on several occasions - most recently in 1988. It has been due for a reauthorization since 1992, but a politically stalemated Congress has failed to come to an agreement even though many bills have been proposed (no reform legislation has actually been considered on the floor of either the House or the Senate).

The 108th Congress is the best environment in Washington that has existed in the last decade for sound change to the ESA. We must push our representatives to make changes now.

**Since its inception, the Endangered Species Act has:**

- Failed to conserve endangered and threatened animals and plants.
- Discouraged, hindered, and prohibited effective conservation and habitat stewardship.
- Created perverse incentives, thus promoting the destruction of privately owned endangered species habitat.
- Wasted scarce conservation resources.

**The Endangered Species Act has failed in large part because it has engendered a regulatory regime that has:**

- Violated the rights of individuals, particularly property rights.
- Destroyed jobs, devalued property, and depressed human enterprise on private and public lands.

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- Hidden the full cost of conserving endangered species by foisting those costs on private individuals.
- Imposed significant burdens on State, county, and local governments.



### **Endangered Species Act needs to be reformed based upon these principles:**

- Animals and plants should be responsibly conserved for the benefit and enjoyment of mankind.
- The primary responsibility for conservation of animals and plants shall be reserved to the States.
- Federal conservation efforts shall rely entirely on voluntary, incentive-based programs to enlist the cooperation of America's landowners and invigorate their conservation ethic.
- Federal conservation efforts shall encourage conservation through commerce, including the private propagation of animals and plants.
- Specific safeguards shall ensure that this Act cannot be used to prevent the wise use of the vast federal estate.
- Federal conservation decisions shall incur the lowest cost possible to citizens and taxpayers.
- Federal conservation efforts shall be based on sound science and give priority to more taxonomically unique and genetically complex and more economically and ecologically valuable animals and plants.

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- Federal conservation prohibitions should be limited to forbidding actions intended to kill or physically injure a listed vertebrate species with exception of uses that create incentives and funding for an animal's conservation.

No matter how we look at it, the key is for us to be involved and included in our own future. Even good, common sense politicians can't read our mind and know what we need for our form of recreation. We must tell them. The same goes for our public land managers. We must also be included in their decisions about our land and waters.

Whether you're a fisherman, hunter, motorized recreationist, sand duner, dirt biker, mountain biker, equestrian, atv'er, rock collector/miner, or whatever, don't let your form of recreation go the way of the Tutouva.



**- Roads, Roadless and RS 2477 –**

Roads, trails, tracks, byways, and routes are just some of the terms used to describe those things we like to ride on. Travel ways, OHV routes, over the snow routes, and other terms surface depending on what part of the country you are in, and what agency you are talking about. To be a good leader of volunteers, you need a basic understanding of roads and rights of ways.

*Here is a brief analysis of the relationship between the roadless initiative, the transportation (roads) rule, and the forest planning rule as provided by: Adena Cook, Public Lands Director (retired, BlueRibbon Coalition)*

**ROADS, ROADLESS AND FOREST PLANNING**

*On May 9, 2000, the USDA Forest Service released the Roadless Area Conservation Proposed Rule, a.k.a. the Clinton-Gore Roadless Initiative. It is not intended to be a stand-alone document. Quoting directly from the Federal Register, "The agency has also recently proposed other regulations and policies that address the management of the National Forest system and how the agency must make decisions about road construction in national forests and grasslands...."*

*The announcement then cites the Proposed Land and Resource Management Planning Rule (Forest Plan Rule) issued October 5, 1999 and the Proposed Road Management Rule and Policy issued March 3, 2000 (Road Rule).*

*Following is a discussion of these three proposals and their relationship.*

**FOREST PLAN RULE**

*Ecosystem protection becomes the over-arching goal for which all national forests must be managed. Ecosystem restoration to a pre-Columbian (ancient) condition is how that protection is defined. Production of all other goods and services are secondary.*

*It absolves itself of responsibility toward local rural economies, stating that national forest lands should not be expected to single-handedly sustain these communities.*

*Claims that national forest land should be managed to compensate for changes caused by management of private land. As adjoining private land increases production of goods and services, the public land should provide less.*

*Public process easily manipulated by officials, deck is stacked in favor of "ecological sustainability".*

*Gives the responsible officer the sole discretion over what topics will be addressed in the planning process, with substantial weight given to topics related to "ecological sustainability".*

*The authority to consider further or deny a topic is not subject to review, nor is an administrative record created.*

*Section 219.6 allows the responsible official to begin the NEPA process only after and based on off-the-record processes (detailed in sections 219.4-5) are complete. Subsequent public participation becomes a sham that verifies or records objections to foregone conclusions.*

*This mimics the cumbersome process by which Endangered Species Act is implemented now: A special interest group pressures the U.S. Fish & Wildlife Service (USFWS) to manage a listed species in a certain way. Studies are conducted, proposals are generated, and the group's request is granted. The USFWS then demands that the land managing agency conform to its findings or violate the Endangered Species Act. The demand of the special interest group validated by USFWS, then drives and dominates the NEPA process.*

## **ROAD RULE**

*The proposed rule makes it clear that there will be far fewer roads open to the public than are currently available. Each road will be subjected to a methodical analysis to justify its existence. This analysis is not generally available and is not subject to review.*

*The agency estimates there are 287,000 miles of road that "are no longer needed" and that an additional 60,000 miles of uninventoried roads need decommissioning. This totals 347,000 miles of road or 77% of all National Forest roads.*

*The agency claims lack of funding to maintain the roads. Yet, they have not requested from Congress any more than 20% of what they claim they need.*

*Driving for pleasure has increased 1000% since 1950, and level 2 roads (counted in the number to be decommissioned) are acknowledged by the agency as important for dispersed recreation. More and more recreationists will be crowded onto fewer miles of road.*

*Areas from which roads are removed will become "unroaded." Their management will be dictated by the same values, for which roadless areas are evaluated, with resource protection values predominant.*

*A standard disclaimer states that because the rule involves mostly new definitions, there is no effect under the Regulatory Flexibility Act.*

*Forest Service officials state that "decommissioning" can also mean re-assigning the road to a trail status and then maintained as a trail-50" and wider and presumably open to high clearance vehicles. While this could provide some opportunity for dispersed backcountry recreation, this direction is not specified in the rule.*



## CLINTON-GORE ROADLESS INITIATIVE

*The Clinton-Gore Roadless Initiative Draft EIS and proposed rule was released May 9, 2000. Implications of the preferred alternative (proposed rule) are still being evaluated.*

*The following are some key points:*

*No new road construction will occur in roadless areas. This will supercede direction that may have allowed for road construction in forest plans. Maintenance on existing, classified roads in roadless areas can occur, subject to conditions.*

*Resource concerns dominate the direction for which roadless areas will be managed:*

- *1) Soil, water, air: Roadless areas have had minimal ground disturbing activities - these are negatively described. Presumably few or no "ground disturbing activities" will occur in the future.*
- 2) Sources of public drinking water. Most of these are addressed in current forest plans.*
- 3) Diversity of plant and animal communities. Claim that roadless areas are more diverse than roaded. Claim that absence of disturbance promotes biological diversity.*
- 4) Habitat for endangered, threatened, proposed, candidate, and sensitive species. Again, they claim that these species need large tracts of undisturbed land.*
- 5) Provide for primitive, semi-primitive non-motorized and semi-primitive motorized classes of dispersed recreation. Acknowledge that the motorized user values renewal, isolation, independence, and closeness to nature in mostly undisturbed settings.*
- 6) Reference landscapes. Appears to broaden concept of Research Natural Areas to study "large scale ecological patterns".*
- 7) Landscape character and scenic integrity. Viewsheds are already addressed in current forest plans.*
- 8) Traditional cultural properties and sacred sites. Claim that roadless areas, in their unaltered states, better protect these.*
- 9) Other locally identified unique characteristics.*

*It claims that the proposed rule will not have a significant impact on small businesses per the Regulatory Flexibility Act. However, because of heightened interest and comment, the agency has prepared an initial regulatory flexibility analysis. Comment is invited, but the document is available only upon request.*

*The proposed rule makes repeated reference to "protection....within the context of multiple-use management" without explaining what "multiple use management" means within the framework of the new forest plan rules and the roads rule.*

*The proposed rule does not address unroaded areas, but defers these to local planning. It is assumed that local planning will occur under the new rules and unroaded areas will be addressed as specified in the roads rule.*

## **“ROADS” SUMMARY**

### **FOREST PLAN RULE**

- ***ECOSYSTEM PROTECTION" IS OVERARCHING GOAL***
- ***PLANNING PROCESS STACKS DECK AGAINST TRUE PUBLIC PARTICIPATION***

### **ROADS POLICY**

- ***ROADS REDUCED BY 77%***
- ***REMAINING ROADS MUST MINIMIZE IMPACT ON "ECOSYSTEM"***
- ***CREATION OF UNROADED AREAS - TO BE MANAGED BY ROADLESS CRITERIA***

### **CLINTON-GORE ROADLESS INITIATIVE**

- ***LOCAL PLANNING PER NEW STACKED-DECK PROCESS***
- ***MANAGEMENT OF ROADLESS AREAS EMPHASIZES RESOURCE PROTECTION***
- ***PROVIDES FOR FULL RANGE OF RECREATION USES WITHIN THE RESOURCE PROTECTION CONSTRAINTS***
- ***REINFORCES THE ELIMINATION OF ROAD MAINTENANCE/CONSTRUCTION SPELLED OUT IN ROAD RULE***

**- RS 2477 -**

**RS 2477 is Revised Statute 2477 pertaining to asserting rights of way to public roads by a county (or parish).** The intent of the Act was to protect public rights of travel and access across public lands.

One of the best Internet places to learn more about RS 2477 is <http://www.rs2477roads.com>. There you can get all the information you need about the statute and how it may apply to your situation.

It was passed in 1866 to help encourage the development of a system of roads and trails. The Act states, “The right of way for the construction of highways across public lands not otherwise reserved for public purposes is hereby granted.” This is muddled by the passage of the 1976 Federal Land Policy and Management Act (FLPMA), wherein it was agreed that no new rights of way agreements would be entered into but that all prior agreements would continue to be valid.

There are lots of opinions about RS2477, and quite frankly, many differing opinions. Most RS2477 disagreements end up being settled in court. Go to the above web site if you need to learn more about RS2477.

**- Roads and Road Engineering -**

The design and layout of roads and trails is a full course in itself. If this is something you want to learn more about, I suggest a couple routes. First, the National Off Highway Vehicle Conservation Council (NOHVCC) has workshops geared to this very subject. Find them at [www.nohvcc.org](http://www.nohvcc.org).

If dirt bike and single track trails are your interest, I suggest pamphlets and workshops from the American Motorcyclist Association (AMA) at [www.ama-cycle.org](http://www.ama-cycle.org).

ATV info can be found from the ATV Association (ATVA) which is a subsidiary organization of the AMA.

I also recommend contacting trails consultants who specialize in your area or terrain. You can contact any of the organizations above to find a trails person, or contact the BlueRibbon Coalition at [www.sharetrails.org](http://www.sharetrails.org).

As a leader of volunteers, in my estimation, it's more important to understand the big picture and things like the ESA, erosion control, and cumulative impacts. However, you now have resources if you want to pursue the engineering of trail design.

One basic concept I would like you to walk away from this Module with, is the idea of erosion control as it pertains to trails and roads. In simplest terms, water runs downhill and forms gullies and rills that lead to further erosion. This runoff of water carries sediment to the nearby creeks and rivers. This leads to pollution, water contamination and habitat loss in some cases. Our job is to build and maintain our trails to mitigate and control the erosion that occurs during wet periods.

Work with your public land manager to find ways to continue to use your trails while mitigating the erosion that may be caused by your trails.



Many projects have proven that this can be done. The Rubicon is still my best example. In one weekend alone, Friends of the Rubicon volunteers moved nearly 1800 tons of rock to build thirty one rolling water

bar/dips in a two mile section of the trail that was suffering from erosion problems. USDA Forest Hydrologists and County Road Engineers helped us design the depth and make up of each water bar. It worked. Two years later the road is still in great shape and not causing erosion problems.

Being a volunteer, helping manage public lands, and staying involved in your sport takes time, energy and effort. But you must do this in order to understand the big picture and how all this environmental stuff fits in. The next thing to understand is the National Environmental Policy Act (NEPA).

Read and learn more about public input and NEPA on my web site at:  
[http://www.delalbright.com/Access/nepa\\_intro.htm](http://www.delalbright.com/Access/nepa_intro.htm)

- **Summary** -

Environmental science is a college course that takes years to complete. Herein I've given you the foundation for understanding what we are up against when we work with our public land managers in "their" world. It's a tough balancing act – humans and nature. But we can do it. Especially when we are involved and leading our volunteers with these new understandings.

You have taken a huge step in the right direction by taking this course. You should continue to find ways to improve your knowledge base of environmental issues.

Now, move on to the exam for Module IX. I "expect" you to fully understand this Module so that it comes natural to you, especially when dealing with volunteers. Your "objective" is to pass this exam with a 100% score the first time through. Have fun.

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This completes Module IX of the Recreational Leadership Training Course.

**Please complete the examination and email it to [del@delalbright.com](mailto:del@delalbright.com), or mail it to:**

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