

Think Globally/Act Locally

(Practical actions individuals can take to practice conservation in their daily lives)

Prepared by David L. Faulkner¹ in honor of Earth Day/2005 (April 22nd) and the 70th Anniversary of the Natural Resources Conservation Service (April 27th, 2005)
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"Conservation is a state of harmony between men and land." - Aldo Leopold

Introduction:

The purpose of this paper is to pass along common-sense suggestions for conservation actions that individuals can take to practice conservation in their daily lives. Practicing conservation improves one's efficiency in resource usage, helps to create and sustain a healthier environment and can diminish one's contribution to the build-up of greenhouse gases and global change. Each action described in the paper has direct benefits that practically serve those who undertake them. So even if you are not interested in conservation for the sake of conservation, or if you are not interested in reducing your contributions to global warming and global change, then simply consider the following information as a list of alternative actions that might help you better enjoy life while treating Mother Nature more respectfully.

Technical references and more detailed explanations have intentionally been left out for brevity and in order to focus on the desired tasks that can make a difference in your home, at play, in your community, in the work place, in the market place, in support of nature-supporting public policies by all levels of our local, state and national government and private businesses, on our farms and in our privately held forests; simply put, everywhere. Just as any act that destroys a part of the strand of life has damaging effects that ripple throughout the world's ecological system, the opposite is also true. Every individual act that improves part of the web of life imparts direct effects that contribute to making the world a better place. With this understanding in mind, this paper hopes to further popularize the simple maxim and philosophy of "Thinking Globally and Acting Locally".² Awareness and understanding of how our individual choices and actions collectively affect our natural resources can lead to more informed choice and enhancement of our natural environment.

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² Your ideas and suggestions for other ways to make a difference are welcome. Please forward your suggestions to david.faulkner@va.usda.gov and they will be posted on the Virginia home-page with this paper at www.va.nrcs.usda.gov under "News" on the Virginia "Publications" page; Thank you in advance.

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At Home:

In your yard...

- **Leave your mower clippings where they fall on the lawn so they will build soil organic matter content.** This will work best if you use a mulching mower. Any mower can function as a mulching mower as long as you don't bag and export the clippings from your yard. In addition, special blades for mulching can be added to most mowers. They simply shred cut lawn material into finer pieces. The fine pieces drop to the surface of the soil more easily and get incorporated into the soil better than clippings from standard mower blades. As organic matter builds up on the surface of your soil, the below ground volume of organic matter also increases as a healthier growing environment is created. Some organic matter left on the surface also gradually gets incorporated into the soil profile which in turn further builds soil quality. Increased soil organic matter creates conditions favorable for the development of soil aggregates. Soil aggregates are naturally forming clumps of soil which help to create pores in the soil profile. Increased organic matter and soil porosity promote a healthier soil environment by allowing greater infiltration of valuable rainfall and air and greater nutrient and water storage. More water, air and nutrients are available in healthy, high quality soils. Improvements to soil quality also aids uptake of water and nutrients by lawn plants and helps them to be healthier.
- **Compost all of your organic wastes materials/resources.** Don't throw recyclable organic materials away. They are valuable resources, not wastes. There are many ways to recycle them through composting. The important thing is that you do it. Reducing the stream of materials that enter our landfills reduces your waste disposal costs and will also contribute to saving tax dollars. But more importantly, it allows you to take advantage of all the value that kitchen scraps, leaves, pruned plant matter, cut grass and brush, etc. represent. Their organic matter nature and nutrient contents mean that they are an important resource for your garden, flower beds and lawn. Garbage disposals simply transfer vegetable trimmings to your septic tank or local water treatment plant. In either case, "wastes" disposed in this manner are lost to you by the act of throwing them away. They should be utilized as resources. So collect the trimmings and "throw-aways" then compost them either directly in your garden, in a commercial compost bin or simply in a designated area of your yard in a pile.
- **Keep the soil covered at all times with either living vegetation or organic mulches.** By keeping the soil covered you are protecting it from soil and wind erosion and temperature extremes. Vegetation and plant residues absorb much of the energy of rain-drops and the wind and thereby prevent or reduce erosion. In addition, green vegetated surfaces such as lawns are about 8 degrees F cooler than bare soil. They are far cooler than concrete and much more cool than black asphalt pavement. Keeping as much of your yard covered with vegetation will decrease the ambient, micro-environment temperature during the hot summer

months. And of course the vegetation will also increase water infiltration and organic matter content of the soil which improves soil quality and increases the presence of soil-dwelling organisms that are important for the ecological functioning of your soil.

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- **Use minimal to zero commercial fertilizer on your lawn, flower beds and garden.** If you compost all of your leaves collected in the fall, mulch all of your lawn clippings onsite, instead of bagging and disposing of them offsite, and recycle your kitchen “wastes”, then you are keeping all of the nutrients your lawn and household produces and recycling them back into the soil profile. Thus, if you aren’t exporting your organic matter and associated nutrients, then you probably don’t have a need for external fertilizer inputs. This will allow you to essentially need only to monitor the pH of your soil to maintain a healthy growing environment. You can add lime if and when needed for acidic soils and appropriate amounts of acid-forming fertilizers or mulches for alkaline soils. Mulching organic wastes and compost around your flower beds and garden plants will greatly benefit them also. About the only conditions when fertilizers may be called for is when your lot was cleared and the topsoil was lost exposing the less fertile and usually more compact sub-soil. This often happens with typical construction practices and applications of fertilizer, lime and organic matter will help to more quickly increase the fertility of the site and to improve soil structure. Once the soil structure and quality is re-established, then you won’t need to add much in the way of external inputs as long as you mulch all of the clippings.
- **See if your local government has organic matter available.** If you don’t have enough organic wastes for mulching your flower beds and gardens, then see if your local government has available shredded organic matter or even better, decomposed leaves, sticks and twigs. Many local governments make these available free of charge from the sites where they are deposited after being collected in your local communities. In some cases you can get completely broken down humus which is ideal for gardening and fertilizing your lawn and flower beds. Less broken down, but well shredded bark and tree limbs are best utilized for mulch beds to increase water holding capacity and suppress weeds.

More is better when it comes to lawn species composition. Monocultures of a single fine-bladed grass species are very attractive to look at, and for this reason they are very popular. But their functional value as part of the ecosystem is very low. In addition, establishing and maintaining them usually requires repetitive and costly additions of fertilizers, lime and herbicides, and sometimes also requires pesticides, fungicides and aeration. If you are willing to accept a more diverse lawn cover (not so neat and pretty, but ecologically healthier and more valuable to nature), especially if you incorporate legumes such as clovers, then you will have a more self-reliant lawn that needs very little purchased inputs to maintain itself. The legumes will fix nitrogen (the single most important plant nutrient) from the soil air and increase the natural fertility of your lawn. In

addition, these type lawns are more resistant to diseases and insects and they are less susceptible to the damaging effects of droughts, especially if a mixture of warm season and cool season grasses, i.e., deep and shallower rooted grasses, are incorporated. The warm season species will go dormant during cool parts of the year in many locations, but you can over-seed with a plant material such as annual rye grass to provide seasonal green cover throughout much of the winter. Whether or not a strategy such as this will work for you is a function of your climate more than any other factor, but no worries, there are plant materials and planting options for each climate zone. Visit the NRCS Plants database web-site for help in selecting plants that will serve your particular needs. It is located at <http://plants.usda.gov/>. It is a fantastic source of information.

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- **Mow your lawn with the highest setting your mower allows** so as to create more natural shading which is especially beneficial for cool season grasses as the summer progresses. Cool season grasses simply cease growing when the upper range of temperature under which they can grow is exceeded. Higher cutting also allows healthy re-growth to occur more rapidly as more vegetative material remains; more water infiltrates, soil temperatures remain cooler and less surface evaporation occurs. In this way the plants stay healthier by also preventing damage to the vegetative parts at their base which are crucial for your lawn to stay healthy. Protecting the base from the damaging effects of close cutting is very important for maintaining a healthy ground cover (only a select number of grass species can take very close cutting without deleterious effects).
- **Use conservation practices in your yard and garden!!!** From tree and shrub plantings, riparian and lakeside buffers, grassed waterways, terraces and created wetlands in your yard, to nutrient management, no-till gardening, mulching, crop rotation and cover crops in your garden, among many others, conservation practices can add value to your home by stabilizing the landscape, beautifying the environment and attracting wildlife. Most conservation practices function to prevent water erosion by maximizing onsite infiltration. With greater infiltration, less rainfall is allowed to “run”-off in concentrated flows. Instead, increased infiltration “walks” surplus water off of your land. Concentrated flows are the most damaging to your yard and garden and also degrade water quality off-site. Use of conservation practices minimizes the risk of gully erosion and prevents the loading of our streams with sediments, organic matter, pesticides and other chemicals used in yards and gardens. **Letting riparian areas be vegetated with trees, shrubs, forbs and grasses is probably the single most important conservation action you can take as a homeowner to improve the quality of our streams and receiving water bodies and associated wildlife and aquatic habitat.** Vegetation along stream banks, ponds, lakes, bays and estuaries, intermittent drainage-ways and associated areas, such as wetlands, trap eroded soil particles and nutrients. They also help to trap and break down pollutants such as oil, pesticides, herbicides and other chemicals that can be very damaging to the natural environment. Permanent vegetation also shades and helps cool aquatic

habitat which is especially important for many high valued recreational activities from trout fishing to hiking to bird watching. Simply put, permanent vegetation, especially tree/shrub/forb³ and grass complexes, enhance the ecological functioning⁴ and aesthetics of your landscape.

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- **Enhanced natural wetlands and created wetlands, as well as shallow ponds installed on your property can greatly enhance wildlife habitat and the beauty of your yard.** They will attract birds, butterflies and other insects, frogs and other amphibians, as well as many other species of wildlife. If well landscaped and artistically constructed, they can also add to the resale value of your home. Go to a lawn and garden show or check out examples in popular magazines to see examples of how beautiful they can be.
- **Plant for shade areas, living fences, windbreaks and hedgerows.** Trees and shrubs planted for these purposes serve both to improve the aesthetics of your property as well as many practical needs such as screening off areas or unsightly views, producing shade/cooling effects, providing buffers that diminish the effects of strong winds, including transport of unwanted smells from adjacent properties, and of course they provide wildlife habitat. Lastly, they take in carbon dioxide (one of the 3 key greenhouse gases – methane and nitrous oxide being the other 2 major ones) and give off oxygen as part of their photosynthetic processes. Trees and shrubs are wonderful in so many ways, so plant as many as you can use.
- **Control/prevent erosion and sedimentation (“E&S”) during construction using conservation practices commonly known as Best Management Practices (BMPs).** Areas disturbed by earth movement and construction easily contribute soil, nutrients and other pollutants to our roads, streams and water bodies. There are many simple practices from silt-fences and rapid seeding of vegetative covers and mulching to storm-water runoff with sediment and debris basins that can help minimize the damaging effects of construction. Grading concrete and/or paved blacktop areas towards your lawn will allow the plants and soil present to absorb/break-down any pollutants that runoff. Consult your local NRCS, Soil and Water Conservation District or erosion and sediment control authority for more ideas and information on “E&S Control” regulations and BMPs.
- **Install bird feeders, bird homes and bird baths, bat and butterfly houses and plant vegetation (especially flowering shrubs) that provide cover, nesting and**

³ Forbs are herbaceous, i.e., non-woody, plants other than grasses.

⁴ “Ecological functioning” means the provision of habitat (medium for growth with nutrients and water for the primary producers (plants) and water, food, cover, nesting and brooding areas, etc. for secondary producers such as insects and animals), the removal and/or remediation of pollutants such as herbicides, insecticides, nutrients, etc., the control of water and wind erosion, the diminishing of the wind’s ability to transport unwanted smells, nutrient, organic matter and water cycling, etc.

brooding areas, and that produce seeds, nectar and other vegetative parts beneficial to wildlife and beneficial insects such as ladybugs and butterflies. American Cranberry bush, Bittersweet, Cherry, Crabapple, Firethorn, Flowering Dogwood, Hawthorn, Highbush Blueberry, Holly, Red Cedar, and Winterberry, among many others are very good for providing wildlife habitat. Nectar producing plants, such as Black-eyed Susans, and many other flowering plants, are especially important for bees and butterflies. Bees are important for almost all flowering plants and butterflies area also important pollinators and add beauty and wonder to your environment.

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- **Plant beneficial plants that serve different environmental functions.** In your flower beds and gardens plant vegetation known to repel nematodes, damaging insects, slugs, etc. e.g., marigold plants repel root damaging nematodes while also beautifying your environment with their flowers. Other plants with repellent properties include garlic, onions, nasturtium, geraniums, turnips, and tansy. You can also plant specific species that pests love so as to attract them away from your vegetable garden. There are many ways to naturally deal with nature and learning about natural cycles and biological relationships such as between pest and beneficial predators will help you to achieve beauty and beneficial functions such as natural control of pests in your yard. Search on the web for additional information on natural pest control methods.
- **Do you really have to buy and use an electric or gas-powered blower or string trimmer?** Maybe you do, so fine. But perhaps many others could use the exercise that rakes, brooms and hand-weeding tools afford. Use of brooms, rakes and hand weeding tools provide the operator with light cardiovascular exercise without generating greenhouse gases in volumes anywhere close to what blowers do (another attempt at humor), and without having to endure the irritating vibration of your physiology as happens with blowers and string trimmers. Lastly, rakes, brooms and hand powered weeding implements don't generate the noise pollution that blowers create.
- **Facilitate groundwater recharge** by limiting the amount of impervious (built-on and paved) surfaces on your property and by installing gravel filled "tube-wells" that easily permit surplus rainfall to soak deeper into the soil instead of running off of your lawn. These can be installed as large or small as you want to make them and as few or as many as your climate and geography call for. They can be hand-dug with post-hole diggers and back-filled with gravel, then place soil and vegetation on top, or they can be drilled with gas-powered post-hole diggers or even backhoes. The main idea is to allow surplus water to have the opportunity to percolate to the deeper levels of your soil profile where it can be stored for slower release into adjacent streams and water bodies, or simply reside for your trees and deep rooted grasses, shrubs and garden crops to take advantage of as dry periods ensue. The excavated soil can be added to existing or new flower beds and

vegetable gardens. Gravel-filled trenches along walkways and driveways will have effects on groundwater recharge similar to gravel-filled tube wells as runoff is collected in these areas and soaks into the soil profile. These can be especially effective if your soil has a hardened surface layer typically called a hardpan with an underlying more permeable soil layer. Getting rainfall past the hardpan to the deeper more permeable layers is the objective.

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- **Plant native or naturally adapted lawn and garden species.** Avoid the need for expensive irrigation systems by planting grass and ornamental plant species that are either native to your area or are naturally adapted, non-invasive and will thrive without added water. This can save you a lot of money as the initial investment cost of irrigation systems, especially those with automated timers and on and off switching valves, can be quite expensive and the re-current cost of maintaining them, e.g., sprinkler heads damaged by the lawnmower, and paying for irrigation water itself can also add up. In a state such as Virginia that receives on average over 40 inches of precipitation that is fairly well distributed over the year, irrigation systems for homeowners are simply un-necessary. Yes, the Shenandoah Valley receives only about 30-35 inches of precipitation which is much less, and much of the state is subject to several weeks of drought in the summer, but at best only supplementation irrigation of yards is needed in most of Virginia. An increasingly common scene today is to see expensive sprinkler systems on timers distributing expensive treated water during a downpour of rain. What sense does this make? The systems weren't needed in the first place and send water ("dollars") down the storm drain.
- **If you do irrigate, use rainwater. You can capture rainwater with roof-runoff collection systems** for use as a source of water for supplemental irrigation. Commercial rain barrels and cisterns are available that can be positioned to collect rainfall from gutter downspouts. Home-made ones can also be assembled from common barrels and other materials. The best news of all about rain water is that it is generally much better for gardens, lawns and flower beds as compared to municipal water because it does not contain chlorine. Having not been treated with chlorine, rain water is generally less damaging to earthworms, macro-invertebrates and other soil dwelling micro-environment organisms and micro-organisms (acid rainfall due to air pollution is an exception to this generalization).
- **When irrigating, do so sparingly, especially on lawns.** Repetitive frequent irrigation of your lawn or garden weakens the plants by encouraging their root systems to remain close to the surface. Surface roots are the first to die during a prolonged drought. Plants with mainly surface root systems are the most susceptible to damage and possible death from drought. Prolonged droughts periodically occur in most areas and sooner or later usually result in local units of government imposing mandatory water use restrictions. So, "don't get caught

without your roots inadequately down” or rather too high up (I apologize for the feeble attempts at humor, but if it gives you a smile, then great.).

- **When irrigating, especially during the summer, apply water either late in day or early in the morning to reduce evaporation losses.** During the spring and the fall don't water at all unless absolutely necessary and obviously in the winter around here irrigation isn't needed as most plants are dormant.

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- **If you must buy an irrigation system, soaker hose and drip irrigation systems are the most efficient means to deliver any needed water to your flowers, prized trees, shrubs and vegetable gardens.** Drip systems may have higher initial costs, but low operating costs and usually will pay for themselves over time compared to fixed pipe and above ground sprinkler systems.
- **Use environmentally safe ways of controlling weeds and pests,** e.g., prefer non-chemical ways of achieving these purposes. There are many earth-friendly management techniques and alternatives that can be found in organic gardening publications from the public and private sectors. Also keep in mind that only an estimated 1% of all insects are bad for lawns, flower beds and gardens. The rest are beneficial insects, such as ladybugs that eat aphids; lacewings that eat many caterpillars; and praying mantises that eat all kinds of insects. Many pesticides are broad spectrum, i.e., they are not very selective in what they kill and also have other negative effects on the environment. Chrysanthemum-derived pesticides, citric acid, diatomaceous earth and boric acid all are earth friendly and can help control unwanted pests. Dishwashing liquid also can be used when diluted (3-6 tablespoons/gallon of water) to control some insect pests. To control weeds, use lemon juice and vinegar. It is available in some garden centers under various commercial names. To control ants use ground red cayenne, habonera or other hot peppers ground up and dissolved in water.
- **If you install a septic tank system for waste disposal, make sure it is properly sized along with an adequate drain field in order to prevent problems.** Proper maintenance should also be performed periodically to prevent trees roots from disrupting the functioning of your system. Under-sized systems and poorly functioning systems from inadequate design or maintenance sometimes need to be pumped out and/or have the lines cleaned of roots which can be very costly. In addition, the “fragrances” from these “events” and malfunctioning drain fields certainly won't be enjoyable for you or any of your close neighbors.
- **Keep clean water clean.** Divert clean water from roof-tops, patios, driveways and other collection surfaces safely away from areas susceptible to erosion using downspouts, splash deflectors, earthen water-bars and diversions, grassed waterways, etc. Water-bars are basically baby diversions and diversions are simply low mounds of earth designed to control where runoff goes and the speed

it moves so as to prevent erosion. Directing clean water from impervious areas away from poop infested dog kennels will also prevent damage to down-slope water quality. Keeping clean water clean is analogous to the proverbial...“An ounce of prevention is worth a pound of cure.”

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- **Let floodplains be floodplains.** Don't build in floodplains and you will keep yourself “out of harm's way”. Let natural vegetation flourish in floodplains and the ecological functions of these natural systems will soar. So keep the mowed limits of your yard away from floodplains for maximum natural functioning and minimizing your property at risk.

Inside your home...

- **Be frugal with your water resources inside the house.** Take shorter showers; use cooler water as opposed to hot water that consumes more energy; be efficient in washing your hands and dishes, i.e., turn-off the water while gargling, brushing and shaving; rinse dishes in a pool or bowl of water instead of a constant stream; install low-flow shower heads and toilets or retrofit old toilets with objects in the tank that displace some of the water used with every flush; and during droughts capture/recycle water from the bath, shower and sink to be used on the lawn, flower beds and garden. This practice can keep your prized shrubs alive during the drought and prevent you from getting a ticket for irrigating during prohibited times.
- **Maintain the plumbing in your home.** A dripping faucet can waste 20 gallons of water or more a day.
- **Dispose of/Recycle pet waste by burying it under mulch in your flower beds.** If you don't have a lawn and flower beds, then dispose of pet wastes in the toilet or your garbage (this comment applies to pet wastes, and not necessarily cat litters that are treated with or based on chemicals that could pollute your flower beds).
- **Use only three squares of TP after each BM and flush only once a day...**just kidding; had you going, thinking is this guy nuts? A little humor and a lot of common sense reasoning can help one keep a healthy perspective and achieve a healthier natural environment. That said, most folks probably do flush more than is really needed for maintaining hygienic conditions, i.e., is it really necessary to flush after each time someone does “number one”? Flushing each time after a stinky “number two” makes sense, but after every couple of number ones is probably enough...okay so maybe I am nuts. I now apologize for my humor as well as my nuttiness!!! ☺ Remember collective effects and imagine the possible savings of water needing treatment if a community of 100,000 flushed 33% less often and with less water per flush...the savings would add up very quickly.

- **Recycle/properly dispose of all used oil and anti-freeze when maintaining your vehicles and powered equipment.** If you change your own oil or anti-freeze, there are designated recycling centers that will take them either for free or a small charge. Even small amounts of oil can be very damaging to water quality in our streams and water bodies, so please dispose of them properly. Anti-freeze lapped-up by a pet cat can be lethal and they are attracted to and like the taste of anti-freeze.

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- **Recycle/properly dispose of all un-needed solvents, cleaners and other household chemicals.** Consult your local health department or county government agencies such as the Cooperative Extension Service for information about proper disposal of toxic chemicals that could be very harmful to the environment. Don't flush them down the toilet.
- **Recycle all food and drink containers, packaging, card-board and grocery bags.** If you have the blessing of living in a community with curb-side recycling, then take full advantage of it. If you don't have this convenience, then take your recyclables to local schools, or other civic groups that use recycling as a fund raiser, and/or public and private recycling stations.
- **Limit the amount of recyclable materials you need to deal with** in the first place by using non-disposable shopping bags and baskets and by selecting/purchasing products with minimal packaging. Durable shopping bags and plastic shopping baskets can be used over and over. Many grocery stores sell them with their logo on them, as do many environmental groups to promote conservation.
- **Retrofit your home with florescent and the newly emerging light-emitting diode (LEDs) type lights** as alternatives to conventional incandescent lights and energy consuming halogen lights. Florescent lights and LEDs have higher initial costs than incandescent lights, but are generally less expensive than halogen lights and more than pay for themselves over time with lower operating costs and much longer useful lives.
- **Conserve energy in your home by:** turning off lights when not needed; using programmable thermostats that control both the trigger temperatures and the hours of the day when heating and cooling will be turned on and off; and by getting your local power supply company to conduct an energy audit to determine weaknesses in your insulation, heating and cooling systems that can be cost effectively improved. Many utilities offer energy audit services to their clients. Some even have on-line tools to help you evaluate your home energy conditions and potential savings.

- **If you use cordless tools, kitchen gadgets, and other gizmos, then use those equipped with the newly marketed nickel-metal hydride (NiMH) rechargeable batteries** instead of nickel-cadmium (Ni-Cad) batteries. They weigh less, last longer and are far less damaging to the environment if disposed of improperly as compared to the very negative environmental effects of nickel-cadmium batteries. And be sure to properly dispose of all batteries, especially motor vehicle and Ni-Cad batteries, when their usefulness is over.

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- **Save draft print-outs from home computer work.** These sheets may be saved for future drafts by printing on the opposite side instead of directly discarding them. When both sides have been used, then place them in recycling bins.

In your community:

- **Don't litter, but when you see some, then "Pick it up, don't just leave it there".** Littering is a singular act of ignorance. Nothing defines ignorance better than the improperly discarding of waste paper, food wrappers, drink containers, cigarette butts and lighters, batteries, car tires, refrigerators, washing machines, couches, lamps, action figures, etc., etc. Litter is a completely preventable malady...a symbol that the education of our citizens is not complete and represents another waste of our resources that is also damaging (polluting) to the environment as many if not most human made products and their containers may be recycled which lessens demand on our base resources. Many items of litter not only represent visual pollution, they also emit toxins over time as the sun, wind, rain and changing temperatures break them down.
- **Recycle damaged/expired cell phones, computers, televisions, radios, power tools, etc.** There are numerous recycling programs that utilize old phones, computers, appliances and even power tools. More and more companies are offering recycling services. Search for your local programs and national companies that offer recycling assistance via search engines on the internet.
- **Recycle used/empty computer printer ink cartridges.** Some retailers will accept these for recycling.
- **Purchase and use recycled paper, cardboard and other recycled products.** Purchasing and using recycled products reduces the demands on our natural resource base, directly and proportionally reducing associated environmental damages, and builds demand for some products that still lack adequate economies of scale in production to be competitive with non-recycled products. Thus, your voting with your pocketbook helps to build a new economy; one that is less dependent on raw materials extracted from the environment, and more dependent on closing the product loop from raw material to "disposal" via recycling. Look on the labels of products to see if they contain recycled materials.

- **Drive less** by consolidating trips, carpooling, taking the bus, biking, walking, rollerblading, and hitch-hiking, etc. For those who just awoke in the 21st century, disregard the last suggestion as hitchhiking can be very hazardous to your health these days...how times change.
- **When you do drive, use cruise control and make slower starts and stops.** Driving more gently and at consistent speeds on the highway is easier on you, your passengers and the car itself which will lower your maintenance expenses.

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- **Choose high-mileage vehicles over gas guzzlers.** Hybrids are especially catching on as a high mileage alternative to cars with conventional gas combustion motors. They combine gas and electric motors to more efficiently serve transportation needs without sacrificing a lot of performance or comfort. Non-hybrid small cars also get far better mileage than larger cars and don't have the added cost of the new hybrid technologies.
- **Keep your vehicles, boats, mowers, generators, etc. in good operating condition.** Vehicles and other products with motors operating at their highest level of efficiency, even polluting and resource consuming SUVs, pollute far less when well maintained than when they are not maintained properly and are poorly functioning.
- **Respect burn restrictions and laws.** Open fires at the wrong time of the year, or the wrong time of day even, can result in catastrophic wildfires. Composting is a far more safe means of disposing of organic wastes and turns them into a resource for your lawns, flower beds and vegetable gardens. Take other non-organic wastes to the landfill instead of burning them. Don't burn at all unless absolutely necessary.

At Play:

- **Prevent trail damage by staying on recreation and backcountry trails, i.e.,** don't cut across "switchbacks". Switchbacks are designed and installed on trails to prevent erosion. Shortcutting between them by sufficient numbers of people causes gully erosion and can lead to the necessity of closing trails for repairs. These added expenses are avoidable with proper respect for the access that allows us to better enjoy our natural resources.
- **Pick up litter whenever and wherever you find it** and teach your children not to litter in the first place.
- **Respect burn restrictions and laws.** Open fires at the wrong time of the year, or the wrong time of day even, can result in catastrophic wildfires and could destroy the beautiful campsite you visited to enjoy.

- **Make sure recyclable materials are placed in appropriate receptacles** so they are recycled instead of ending up in a landfill or an incinerator.
- **Practice “leave no trace” camping.** Our ever growing population results in increasing pressure on our recreational sites. So take care to leave them in good shape for the next users to enjoy. This means pack-out whatever you take in.

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- **Don’t feed wild animals in the wild, e.g., in our national parks and wildlife refuges.** Wild animals in protected areas often become far too tolerant of, i.e., un-fearful of humans and can become very aggressive at seeking handouts. This happens because they wrongfully come to perceive that humans are not a threat to them. Remember, these species don’t have opposable thumbs; they don’t walk erect and do not possess the ability of advanced reasoning nor communication (come to think of it many humans only have the opposable thumbs part of the three criteria...just kidding...not!!!). Most of us are many generations removed from the days of frontier existence and several generations removed from farms. Some have always had urban and suburban experiences. Thus, closeness to nature and the common sense lessons that are learned on a farm or through living/existing in or near wild areas are not a part of the experience base of most folks anymore. So invariably some unknowing visitors to natural areas think (wrongfully) when they encounter wild beasts that they aren’t wild beasts.⁵ They may even initially think that they are cute, fuzzy, loveable critters that you could just walk up to and pet. These thoughts stand out among the category of “famous last thoughts, words and actions” that immediately precede famous last acts, and/or very regrettable acts. For example, such encounters can lead to faulty discernment/overvaluation of the cuteness quotient as compared to the common-sense reasoning faculty/safe behavior decision criteria which can lead some to the conclusion that feeding them would be a cute and a good idea...not!!! Black bears don’t know where your picnic sandwich ends and your hand begins. And contrary to at least one very cute children’s book, moose do not eat chocolate chip cookies, but pack a heck of a kick. Lastly, dolphins actually don’t think of themselves as human transportation aids. In addition, many human food items are not good for wildlife anyway (nor us ☺) and can harm them or at a minimum lead to poor digestion. Poor digestion can cause greater quantities of methane to be produced and methane is a very potent greenhouse gas (know what I mean??? ☺). Besides, some of these animals get far too used to humans and can end up having to be relocated away from us at significant public expense or even killed in worst case situations. Nature is amazing and can be wonderful to experience, but use your common sense and avoid potential problems with wild creatures, big and small and you’ll help to conserve these natural assets.

⁵ Remember two things related to this discussion: Wild beasts are wild beasts. Beasts react when motivated by fear, hunger, anger or dysfunction, as with rabies, with brutal acts. So stay clear of them. Observe them and appreciate their nature from a safe distance.

In your Community:

- **Teach our children how to live lives that lessen the damaging effects of our daily lives on the earth's life support systems.**

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- **Control trail damage and damage to common areas of parks** by thoughtless visitors through workdays with civic groups to repair the damages and erect signs that explain proper access and use of trails and common areas.
- **Organize and/or participate in workdays to clean-up community trails, roadsides, parks, lakes and other common areas.**
- **While walking the dog in public areas, carry plastic bags to collect their fecal waste, then dispose of it properly by burying it under mulch in your flower beds.** If you don't have a lawn and flower beds, then dispose of pet wastes in your garbage...I know, what a pain in the pituty, but it would help. Folks in big cities know all about this.
- **Pick up litter whenever and wherever you find it** and teach your children not to litter in the first place. "Litter happens", but is completely avoidable if we are respectful of our environment.
- **Support/encourage local use of low impact development (LID) practices⁶ and strategies that aim to protect our natural resources by minimizing the negative effects of infrastructure development and construction of new buildings while also reducing related costs.** LID practices include:
 - Instead of piping storm runoff to a central location, bio-retention systems (wet and dry storm-water detention basins), infiltration trenches and infiltration drain-fields allow for pollutant removal/remediation and groundwater recharge (these same practices also work very well when incorporated within/adjacent to parking lots, malls, office and shopping areas, neighborhoods, etc.);
 - The incorporation of lots of green space (natural areas) and the planting of lots of trees and shrubs wherever possible (you can have stands of trees that need thinning, but you can't hardly have too many trees in built-up/urban and suburban environments);

⁶ Thanks to the pioneering work of professional staff during the 1990's in Prince George's County, Maryland, LID is growing in terms of influence and actual development actions across the country. An excellent summary of LID concepts and practices, their costs and benefits, is available at http://www.lowimpactdevelopment.org/lid%20articles/practLowImpctDevel_jul03.pdf

- Buffers (vegetated filter strips) and wetlands (newly constructed and/or enhancement of existing natural wetlands) can greatly reduce non-point source pollution (sediment, chemicals, e.g., pesticides, fertilizers, herbicides, improperly disposed of oil, anti-freeze, cleaners and solvents, etc., organic matter and litter, etc.);
- Use of rain barrels and cisterns for irrigation water collection and use around public facilities and private businesses;

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- Use of on-site wastewater treatment systems such as natural wetlands where appropriate to treat wastewater and protect the environment from conventional treatment plant overflows during storm events;
- Use of new, non-conventional approaches to traffic flow designed to maximize circulation and minimize energy wasted in traffic jams;
- **Encourage enforcement of local erosion and sediment (E&S) control ordinances.** Often local governments have good E&S ordinances in place, but lack the staff to adequately see that they are properly implemented. Public concern to prevent erosion and sediment problems can help to strengthen these programs so that the letter of the law is implemented.
- ***A Model Environmental Policy/Program for your local community might include consideration of the following:*** Every community has an identity. Each community identity is as dependent upon the area's natural resources as it is upon the human residents and their social relationships as well as their relationships with the natural environment. These relationships are completely interdependent. The quality of each is determined by how well our social relationships are conducted and how we relate to the natural world around us. Each community is subject to the workings of many environmental influences. These environmental influences directly affect the health, well-being and quality of life locally as well as the overall environmental performance of nature around us. Environmental performance is indicated by how resilient local resources are in the face of climate extremes such as prolonged drought and flood events. Environmental performance may also be gauged by the quality of water leaving your community and heading to downstream users. Environmental performance also can be subjectively measured by the beauty one observes around you. Indeed, greater beauty also can translate into higher property values. The following is a summary of environmental policies that favor nature and could be incorporated into your local community's environmental policy and practices:
 - Preserve/protect and enhance your local environmental amenities, especially high-valued water resources (estuaries, lakes, ponds and streams) and sensitive water features/areas such as natural springs, seeps, and wetlands, known or designated groundwater recharge areas, karst

topography features such as sinkholes, and closed basins, and lastly riparian zones (Riparian zones include the streams themselves as well as the areas within the stream's zone of influence from surface and sub-surface water flows. Thus, the stream itself and the area parallel to the stream including the stream channel, the banks, adjacent floodplain and all streamside vegetation are thought of as comprising a stream's riparian zone). These areas are preserved/protected and enhanced by:

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- Use of Low Impact Development (LID) practices
 - Encouraging shoreline and streamside vegetation;
 - Creating vegetative buffers adjacent to and around sensitive areas;
 - Discouraging or even prohibiting use of gasoline powered boats, swimming and skiing in water supply reservoirs;
 - Vigorously enforcing local erosion and sediment control ordinances requiring the use of silt-fences, sediment and debris basins, and other means to prevent soil erosion and water pollution;
 - Requiring the scooping/disposal of pet poop deposited adjacent to water supply sources;
 - Establish and maintain a water quality monitoring program;
 - Promote fish passage to upstream spawning areas for reproduction by maintaining stream channels free from debris blockages, unneeded dams and excessive sediment deposition;
 - Let floodplains be floodplains;
- Encourage/promote/adopt on-site storm-water management practices including use of sediment and debris basins, rain-gardens, wetlands, and ground-water recharge ponds;
 - Avoid discharge of toxic chemicals by organizing and promoting the collection and proper disposal of toxic chemicals used in businesses, homes and gardens;
 - Avoid control of garden pests and weeds with toxic chemicals by promoting natural methods of control;
 - Include sustainable living tips, e.g., how to minimize fertilizer applications to lawns, within your local newsletters and/or water and sewer bills as a low cost means to pass along helpful ideas for better living.
 - Landscape common property with native species that require little to no maintenance and that also provide wildlife habitat;
 - Use pervious materials for paving parking areas to encourage groundwater recharge;

- Plant trees where ever possible and replant trees when lost due to storms, vehicle impacts, disease, termites, etc.
- Establish curbside recycling in your community for all recyclable materials;

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- Provide guidance regarding the feeding of wildlife;
- Promote green-space, natural corridors and wildlife sanctuaries; pedestrian and bike trails, and recreational facilities of all sorts;
- Promote screens to block noise, pollution and unsightly views from major highways;

At Work:

- **Encourage adoption of recycling programs in your work place.** If they already exist, work to expand them to include all recyclable materials (plastic bottles, other containers and bags, newsprint, computer paper, all metal cans, paper bags, juice and milk cartons, ink and toner cartridges, etc.). Our garbage containers should only receive those items that can't be recycled.
- **Encourage the purchasing of recycled paper and other recycled products for use in your work place.**
- **Encourage the purchase and use of low emission vehicles such as hybrid cars and buses.** Even if only a few are procured, the symbolic value could be inspiring to many members of the public and a very good public relations/public image improvement tool while also helping to increase effective demand for these vehicles which will eventually contribute to achievement of economies of scale and cost/price reductions.
- **Work to minimize the number and amount of paper copies distributed via emails, reports, file copies, etc.** Electronic copies will suffice in many if not most workplace situations.
- **Encourage your office park owners/managers to incorporate Low Impact Development (LID) practices into the local landscape.** Also encourage them to plant trees and shrubs wherever possible and to use low-flow toilets and energy efficiency enhancing technologies.

In the Marketplace:

- **Support sustainable agriculture** through buying locally and alternatively grown foods as much as possible. Alternative agricultural production systems emphasize the gathering of knowledge of nature, close observation of natural resource conditions and trends and high levels of management applied to using natural processes and cycles such as nitrogen fixation instead of conventional methods that are chemically intensive. Biological relationships and natural cycles are used to sustain and enhance biological interactions on these farms and to minimize use of external chemical inputs. Alternative agriculture is holistic and natural systems oriented. The derivative agricultural products tend to cost more than conventionally grown products with agrichemicals, but part of the real costs of conventional chemical dependent agricultural products are passed along to the general public through environmental contamination, health effects and clean-up costs. Alternative agricultural production tends to be benign or even beneficial to the natural environment. Consumer demand for alternative agricultural products represents the fastest growing segment of the agricultural sector of our economy. As demand has grown for non-conventionally grown farm products, supplies have increased and prices have been coming own in many markets. In addition, the growth of alternative products has encouraged some conventional producers to convert to methods such as organic production. Many others are migrating towards lower input and more sustainable production systems by using less off-farm inputs such as chemical fertilizers and agrichemicals which yields dividends in their own “pocketbooks” and for the environment as well.

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- **Shop with earth-friendly businesses**, e.g., automotive centers that accept old batteries for recycling, produce suppliers with alternative and naturally produced vegetables and fruits, companies that return a part of their profits to the local community for civic projects, and companies that contribute to environmental organizations to further their causes, companies that invest in environmental improvements and natural resource projects to “offset” the net greenhouse gases they contribute to the atmosphere as a matter of doing business, etc. If the market (you and me in sufficient numbers) demands environmental sensitivity and responsibility, i.e., accountability for actions that pollute, then the market will gladly deliver their products and services in earth-friendlier and earth-friendly ways. Indeed, there is growing evidence that companies who position themselves to produce and market in earth-friendly ways are being received very favorably by a growing segment of the consuming public who prefer “green-products” and want to reward environmental sensitivity.⁷

⁷ (as reported by Newstream on their internet web site/service for the media at newstream.com with no endorsement nor implied endorsement intended by the NRCS in VA). A new study by Winslow Management Company adds to the evidence that companies that are good to the environment are also good to their shareholders.

On the Farm and in our privately held Forestlands:

- **Use conservation practices and alternative agricultural production knowledge and methods to enhance the profitability and environmental performance of your working farm and woodlands!!!** See your local Soil and Water Conservation District – SWCD (Resource Conservation Districts or RCDs out west) and Natural Resource Conservation Service (NRCS) service center for more information, as well as technical and financial assistance through the Environmental Quality Incentive Program (EQIP). Among the very best things you can do to benefit nature and enhance the productivity and resiliency of your working fields, pastures and woodlands are:

Green Index Returns 98.5% vs. -10.69 For S&P 500, 32.77% For Russell 2000 - March 2004: Since it was created four years ago, the Winslow Green Index (WGI), an equally weighted index of 100 "green-screened" companies, has had a cumulative increase in value of +98.5%. In comparison, the S&P 500 has had a cumulative decrease in value of -10.69%, while the Russell 2000 had a cumulative return of +32.77%. The annualized return for the period was +16.78% for the Winslow Green Index, in spite of the bear market of 2000 through 2002, while the annual return for the S&P 500 was -2.53% and for the Russell 2000 was +6.62%. These performance returns cover the period August 1999 through December 2003. As always, past performance is no guarantee of future results.

"Green stocks aren't likely to outperform their benchmark by a factor of more than three-to-one in all cases, but our study provides further evidence that green begets green," said President Jackson W. Robinson. "That is, we believe companies that care about the environment are well positioned to produce better returns than companies that don't."

"We believe companies that take advantage of environmental opportunities can gain a competitive advantage over their peers through cost reductions, quality improvements, increased profitability, and access to new and growing markets," Robinson added. "Environmentally responsible companies also have less risk of environmental liability, which could have a major impact on future stock prices."

Robinson's conclusions are not only supported by Winslow Management's latest study, but also by the following studies that evaluate the connection between environmental and financial performance:

- *"The Emerging Relationship Between Environmental Performance and Shareholder Wealth"*, by Ralph Earle, Assabet Group (2000). Perhaps the most comprehensive study to date, this study researched more than 70 articles, research papers and books discussing the link between companies' environmental behavior and its financial performance, as well as the performance of nine green funds. Based on the total body of evidence, author Ralph Earle III says that, "the direction of the results paints a potentially compelling picture of a marriage between environmental excellence and investment performance." Assabet also found no evidence concluding that environmental performance had a negative impact on stock performance.
- *"New Alpha Source for Asset Managers: Environmentally-Enhanced Investment Portfolios"*, by Innovest Strategic Value Advisors (April 2003). This study investigates the effects of incorporating environmental and social analysis as part of the investment decision-making process. The study is based on live, real time simulations for six investment portfolios of a major pension fund during 2002. In five of the six portfolios, the results indicated that Innovest's social and environmental ratings had a positive impact on performance. The study provides further evidence that positive environmental performance can add value to a portfolio.

- **Design, installation and use of management intensive rotational grazing systems** as opposed to conventional grazing systems. The economic and environmental performance of management intensive grazing (MIG) operations, are typically superior to comparable scale conventional grazing cow/calf and stocker operations.
- **If you have an adequate land base, then let your low-wage dairy cows perform all waste management tasks on your farm**, i.e., instead of perpetuating management headaches, exposing yourself to environmental risks and using lots of labor every day and large chunks of sunk capital investments to scrape, push, smell, load, store, smell, agitate, unload,

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transport, smell, apply and smell (did I mention that part?) dairy waste, use rotational grazing as a natural and economically more efficient means to distribute and recycle these resources. The cows will gladly do this. They will thank you daily for being able to live a more comfortable and natural life. The soil resources will thank you as they benefit from the nutrients and organic matter contents and lastly your neighbors will thank you as the general level of emanating fragrance is reduced.

- **For conventional dairies, use rotational loafing lots to minimize or even eliminate sacrifice areas.** Traditional sacrifice areas are a terrible mess, an environmental hazard and a threat to the health of your herd.
- **Consider converting all of the hay-land you can to rotationally grazed pastures.** In doing so you might be able to sell-off no longer needed cutting, raking/windrowing, baling, transporting, storing and feeding equipment. Your capital costs and debt might go down. Demands on your cash-flow will diminish, and your operation and maintenance obligations will go down. If good quality hay for supplemental feeding is reliably available from local custom suppliers, then consider getting rid of all of your hay-making equipment. As a complementary strategy, look into stockpiling some of your fescue hay-fields and convert them to pasture.
- **Exclude livestock from riparian zones and other environmentally sensitive areas, e.g., steep slopes along hills and stream-banks, ponds, lakes, tidal waters, natural springs, seeps, and wetlands, woodlots, and sink-hole areas.** Some of these areas can pose a menace to your livestock, especially calves during floods or winter freezes when streams and ponds can freeze over and your animals could fall through, then freeze or drown. They also tend to offer very poor water quality as animal wastes are deposited and accumulate. Consumption of poor quality water can impair the health and productivity of your livestock. This is especially important for dairy cows given that water is the primary input used to

produce milk. Livestock exclusion coupled with the provision of alternative and clean water sources and installation of vegetative buffers near sensitive areas will allow your livestock to be healthier and more productive while permitting the sensitive areas to heal and perform the vital environmental functions and values they naturally serve including: providing habitat, e.g., food, water, cover, brooding, burrow and nesting areas, etc. for wildlife; the filtering and amelioration of the detrimental effects of sediments, nutrients and agrichemicals; and the provision of beneficial effects such as carbon sequestration and the production of oxygen.

- **Use trees and shrubs in the form of windbreaks, shelterbelts and hedgerows** to slow prevailing winds, screen unsightly areas, and ameliorate the drift of unwanted scents.

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- **Use no-till** (60% or greater residue cover at the time of planting) and other conservation tillage techniques to reduce the fuel inputs, fertilizer and mechanical cultivation needs of your row-crops. Also look into **continuous no-till** for maximizing organic matter content and soil quality, which in turn translates into water quality improvements.
- **Use nutrient and pest management techniques** to minimize expenses and dependence on external inputs and maximize your yields.
- **Enroll prime and associated farmland into the Farm and Ranch Land Protection Program (FRPP) of the USDA/NRCS or similar state and local and private organization programs.** The NRCS, through FRPP and in collaboration with local land trusts, historic preservation and environmental groups, pays the landowner the development value of the property minus the agricultural value. In exchange the owner agrees to develop and implement a comprehensive natural resource conservation and management plan, and also enters the property into a deeded easement that allows for agricultural production in perpetuity. What does society get? Protection of prime farmland, our best farmland, which is vital for maintaining our nation's food and fiber production capacity. Society also gets green space in increasingly urbanizing areas. Lastly, we all benefit from the environmental amenities, functions and values associated with the installed conservation practices.
- **Enroll appropriate lands in the Wetland Reserve Program (WRP) and the Grassland Reserve Program (GRP) of the USDA/NRCS or similar state and local and private organization programs.** Use of **enhanced, created or restored wetlands** and grasslands is a tremendous means to provide the environmental functions and values of wetland and grassland habitats.

- **Use cover crops, grassed waterways, strip-cropping, diversions, terraces, field borders, buffers and contour farming** to prevent soil erosion, and maximize the harvesting of rainfall and sunshine.
- **Use crop rotations to rest and rejuvenate your soil resources.** Legumes in rotation with non-leguminous crops can be a very effective means to build soil quality and break disease and insect cycles.

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- **Use grade stabilization structures and bioengineering** within gullies, and along stream-banks to control active head cuts and stream-bank erosion and to help Mother Nature heal itself where human disturbances or the effects of upstream land use changes have caused stream-channel and stream-bank damage.
- **Use wildlife habitat development and management practices to enhance your farm's ability to attract and support wildlife.** Cutback field borders and other practices, e.g., bush-hogging, burning and planting of appropriate plant materials, etc. that create early successional habitat are especially helpful for the many species dependent upon transitional sites which have been in decline for many years. **The USDA/NRCS Wildlife Habitat Incentives Program (WHIP) can help.**
- **And there are many other conservation practices that serve both the public and private interests in the production of food and fiber as well as the environmental performance of our natural resources.**
- **Recycle all used oil and properly dispose of all agrichemical containers;**
- **Keep farm equipment in good working condition;**
- **Properly handle agrichemicals and dispose of agrichemical containers in safe ways;**

In Support of Environmentally Friendly Policies and Development:

- **Encourage delivery of the very best education we can give our children.** They are our future and we owe it to them to try to leave this world in better condition than when we received it from our parents.
- **Encourage conservation and the development of clean renewable energy sources, technologies and supportive policies,** including research and development that leads to innovations which decrease negative human effects on the earth's life support systems and our dependence on external energy sources.

- **Encourage adoption of Low Impact Development (LID) ordinances at every level of government**, including managed growth so as to minimize sprawl and traffic snarls, fragmentation of wildlife habitat, etc.
- **Encourage inclusion of green space into every local comprehensive plan**, including recreational areas, the protection of headwaters regions and letting floodplains and riparian zones remain natural to permit them to perform their natural functions and associated environmental values.
- **Support research and development aimed at increasing our productive capacity, improving efficiency and enhancing our natural resources and environment.** Sound scientific information and understanding is essential for making progress.

Everywhere:

- **Reduce/Reuse/Recycle!!!** Nothing less than the future welfare of ourselves and our children depends on the actions we take individually and collectively today.
- **Working with nature is the best way to minimize unintended negative consequences from our actions that damage part of the web of life.** Modern history is full of examples of how ideas, once thought to be very bright, were proven over time to have been significant mistakes, e.g.:

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- 1) drainage/destruction of wetlands which were considered by many only useless locales of putrescence and disease;
- 2) use of long-lasting and toxic pesticides that had far reaching unexpected negative environmental consequences such as DDT that almost killed off our national symbol – the bald eagle;
- 3) use of conventional tillage (moldboard plowing) of steep-slope farmland that resulted in severe erosion and degradation of the base resources;
- 4) concentration of animal production and their associated wastes in geographic areas too small to safely and appropriately utilize the wastes;
- 5) intentional importation and use of exotic plant, animal and insect species to serve a specific purpose without understanding the potential for invasive spread and ecological displacement of native species (kudzu, multi-flora rose, autumn olive, Russian olive, tree of heaven, purple loosestrife, mute swans, etc., and on and on;

- 6) the channelization of many of our streams that destroyed the streams connections with their natural tendencies and patterns of moving bed-load and accessing their floodplains, etc.
- 7) use of sink-holes as garbage and waste disposal sites only to poison local groundwater;

The list is very long. In each case we are still spending to try to correct the mistakes made in the past. The good news is that we have learned from these negative experiences.

- **Conversely, working with nature also allows us to improve our natural resources and create greater wealth.**
 - **Yield enhancements** mean increased income from added products sold.
 - **Production efficiency gains** mean increased profits from more output per unit of input used.
 - **Maintenance of the inherent productivity of our natural resource base** assures future generations of the ability to produce food, fiber and perhaps energy to meet their needs.
 - **Working in harmony with nature means less negative ecological system effects** (clean-up, mitigation and repair cost savings) both on-site and off-site and over time, from one generation to the next.
 - **Environmental enhancements improve ecological system functioning and increase their associated values.** Ecological system services are not traded in the marketplace, but are essential for life on earth, e.g, the absorption of carbon dioxide and production of oxygen by terrestrial plants and ocean phytoplankton, the constant process of evapo-transpiration that supports the earth's water cycle, the decomposition of detritus (dead organic matter) accomplished by bacteria, fungi, and carrion-eaters, the filtering and amelioration of water quality by field borders, field buffers, riparian and lakeside buffers, and wetlands, the filtering of air contaminants by hedgerows, windbreaks and shelterbelts, etc.
 - **Cleaner land, air and water contribute to lessened human and livestock health problems and associated lower health care costs.**
 - **A better environment contributes to natural beauty** that can be appreciated daily, as well as increased recreational use values and related incomes, etc.

A Little Historical Perspective:

The Great Plains were originally covered with tall native grasses that held the soil in place. The bison grazed on the grasses and the resident, but nomadic Native Americans, followed the migrations of the bison along with the grizzly bears and wolves. Low human population pressure meant that the natural system of the Great Plains was in a fairly stable state or equilibrium condition. Then a large influx of European settlers occurred in the last half of the 1800s and the early 1900s. These settlers used cultivation techniques and grazing practices more appropriate for the rain-rich east. They plowed the Great Plain's land to cultivate crops, such as wheat and overgrazed much of the remaining grasslands with cattle and sheep. When a prolonged drought occurred in the 1930s, the soil simply blew away.

The combination of poor land use and drought left most of the Great Plains a desert. The desert-like conditions and incredible dust storms blackened the skies and transported millions of tons of soil across the country all the way to the east coast of our nation. On March 15th, 1935, The Kansas City Star reported from Salina, Kansas, that "dust was so thick it was impossible to see anything more than 10 feet ahead. Houses filled with a heavy coating of dust which drifted in every crevice and made breathing difficult. Travel was virtually abandoned". The Associated Press reported that "The pilot of a 10-passenger plane between Cheyenne and Denver reported gusts of dust at altitudes as high as 11,000 feet...At Scotts Bluff, Nebraska, the dust storm reached its height before noon, when the sun was obscured and motorists were forced to turn on their headlights...Goodland, Kansas, groped in almost total darkness. Electric lights could not be seen across the street, and motor-car headlights were unable to penetrate the darkness". The "black blizzards"⁸ would last for days and many areas were repeatedly hit by these terrible storms. "By August 10, 1933 there had been thirty dust storms in the vicinity of Goodwell, Oklahoma"⁹.

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Awful and worsening drought conditions, coupled with the horrible effects of the Great Depression, eventually meant that millions of our citizens could no longer make a living from farming. By 1940 over 2.5 million people had moved out of the Plains states. Life was simply too difficult and unsustainable for so many. "The ultimate meaning of the dust storms of the 1930s was that America as a whole, not just the plains, was badly out of balance with its natural environment." – Historian Robert Worster¹⁰

"A letter from an Oklahoma women, later published in Reader's Digest magazine, recalls June of 1935. "In the dust-covered desolation of our No Man's Land here, wearing our shade hats, with handkerchiefs tied over our faces and Vaseline in our nostrils, we have

⁸ R. Douglas Hurt, *The Dust Bowl: An Agricultural and Social History* (Chicago, Illinois: Nelson-Hall Publishers, 1981), 156

⁹ Douglass Helms, National Historian, *Great Plains Conservation Program: 25 Years of Accomplishment*, SCS National Bulletin 300-2-7. November 24th, 1981

¹⁰ The American Experience – *Surviving the Dust Bowl* at <http://www.pbs.org/wgbh/amex/dustbowl/peopleevents/pandeAMEX06.html>

been trying to rescue our home from the wind-blown dust which penetrates wherever air can go. It is almost a hopeless task, for there is rarely a day when at some time the dust clouds do not roll over. 'Visibility' approaches zero and everything is covered again with a silt-like deposit which may vary in depth from a film to actual ripples on the kitchen floor."¹¹

The bottom line from our perspective as we celebrate our agency's 70th anniversary this month, is that the "Dust Bowl" crisis led to accelerated development of conservation management knowledge and technology, including the importance of understanding natural resources management from a watersheds perspective. Our efforts ever since those difficult days have been directed towards assisting our citizens to try to prevent or lessen the severity of any "Dust Bowl" type crises in the future.

Very Concise Summary and Conclusions:

All of the above discussed actions can contribute to making the world and our own communities much better, healthier and happier places and each of us can contribute.

Best wishes, David L. Faulkner

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"Think Globally/Act Locally.doc"

¹¹ The American Experience – *Surviving the Dust Bowl* at <http://www.pbs.org/wgbh/amex/dustbowl/peopleevents/pandeAMEX06.html>