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Chapter 1 : Vegetation - Wikipedia

The area of vegetation loss, the proposed new index, clearly shows the high level of vegetation loss on typical New River sites, the low level on Grand Canyon sites, and.

This area stretches from the border of Texas to the Mississippi line comprising two wetland-dominated ecosystems, the Deltaic Plain of the Mississippi River unit 1, 2, and 3 and the closely linked Chenier Plain unit 4. Coastal erosion in Louisiana Diorama picturing wetland loss in coastal Louisiana as attributed to human activities The wide range of benefits provided by the wetlands of this region were not recognized by a majority of policy makers in the early 20th century. Wetlands provide vital ecological services including flood control, fisheries production, carbon storage, water filtration and enhanced disagreement over the relative importance of these factors, [11] although it is probably safe to say that the two major factors now acting are subsidence, mostly from lack of sediment, and salt water intrusion from canals dredged to service oil and gas wells and facilitate oil and gas exploration. Further wetland loss is attributed to the construction of the now-closed Mississippi River Gulf Outlet , which introduced salt water into freshwater and intermediate marshes and facilitated significant erosion. Subsidence of the coast is certainly occurring. Some people blame the direct effects of oil and gas extraction. The logic is that as billions of barrels of oil and saltwater and as trillions of cubic feet of gas were removed from the reservoirs in which they had accumulated over millions of years, these reservoirs lost their ability to support the weight of the rocks above. The wetlands on the surface began to sink into the gulf waters. Others argue that subsidence is a natural process in deltas, as sediments compress, and that the real problem is the lack of flood waters that would normally deposit new layers of sediment. Compaction rates have been conservatively estimated at 5mm to 10mm or more per year for the organic-rich Holocene sediment peat that predominates the Mississippi River Delta environment. Given the ubiquity of this compaction-prone sediment in southern Louisiana, coastal restoration project managers see: Louisiana Coastal Protection and Restoration Authority must consider the underlying geology of their regions prior to development as to not exacerbate rates of compaction. With no new accretion and with steady subsidence, the wetlands slowly are replaced by encroaching saltwater from the Gulf. As a result of this apparent engineering dilemma, large areas of marsh are being lost to the ocean. This loss can be reversed at least in some areas but, only with large scale restoration, including the removal of levees to allow the Mississippi River to carry sediment into these areas. Although only a few escaped, there are now millions. By removing plants, nutria both cause loss of vegetation, and, perhaps more seriously, a loss of dead organic matter which would otherwise accumulate as peat and raise the level of the marsh [27] One of the most important natural controls on nutria is large alligators, which may provide a useful tool for biological control of nutria, and therefore for reduced impacts of grazing. Annually Louisiana sells more than , hunting licenses and , fishing licenses to men and women who depend on the wetlands as a habitat for their game. Additional recreational activities such as boating, swimming, camping, hiking, birding, photography and painting are abundant in wetland areas. Wetlands host a variety of trees such as the bald cypress , tupelo gum and cottonwood. Other plants such as the dwarf palmetto and wax myrtle and submerged aquatic plants such as Vallisneria and Ruppia are native to Louisiana wetlands. Wetland plants act as natural filters, helping to remove heavy metals, sewage, and pesticides from polluted water before reaching the Gulf of Mexico. Animal species native to these areas include osprey , anhinga , ibis , herons , egrets , manatees , alligators , and beavers. Although there are several naturally occurring forces that adversely affect the wetland regions of Louisiana, many believe it is human intervention that has caused the majority of the decline. After the levees were built, however, flood sediment flowed directly into the Gulf of Mexico. This subsidence along with the recent sea level rise tipped the balance toward subsidence rather than marsh growth. This, along with the canals built in the area, caused decline of the wetlands and also caused less weakening of and less protection from recent hurricanes such as Hurricane Katrina. This could be a model applied to other coastal regions. Oil company canals[edit].

Chapter 2 : The loss of all vegetation in an area following a drought is called

How can I calculate a gain and loss area of vegetation land having two different lines that represents vegetation in different years. Edit: There are two polylines, one represents the edge of vegetation of a forest in

The incredible scale of this loss has led to significant changes throughout many parts of the world, and in recent years these changes have been accelerating. Deforestation occurs primarily as a result of: And also, to a degree, due to large scale war â€" throughout history fire has often been used as a way to deprive enemy populations of necessary resources. Many of the areas of the world that were deforested thousands of years ago remain as severely degraded wastelands or deserts today. Deforestation Effects, Causes, And Examples: A Top 10 List 1. Agriculture Agriculture is one of the primary drivers of deforestation â€" both in modern times and in ancient times. The vast old-growth forests that once covered much of the world have largely been cut and burned down because of agriculture. Even the most efficient agricultural systems and practices inevitably lead to nutrient loss unless supplemented with fertilizer brought in from elsewhere â€" this nutrient-loss is especially pronounced with GMO genetically modified food agriculture. And this, along with the soil erosion that accompanies the loss of large vegetation, further contributes to the soil erosion and desertification that seems to almost inevitably follow deforestation in the long term. Population Growth And Expansion While agriculture is often the direct cause of deforestation, growing and expanding populations are often the driver. Such large population numbers and densities make people very dependent upon agriculture for survival, and also, importantly, dependant upon expansion. With increased population numbers also comes increased urbanization â€" which brings with it further impetus for deforestation, and also a number of other negative influences on the surrounding areas via various forms of pollution. As large populations often quickly use up all of the resources located near them, they almost always become dependent upon expansion in order to continue fueling their infrastructure â€" this continues until the reliance on distant, far-off resources becomes too burdensome and inefficient, and the civilization collapses or retracts. Western Europe experienced significant deforestation from around to as a result of the then rapidly expanding human population. The large industries of the day â€" the building of wooden sailing ships by European naval powers, colonization and resource-plunder dependent on ships, slave-trade and other sea-based trade â€" largely consumed and used up the forest resources of Europe. The newly empowered resource producing regions often then follows the same trajectory. Desertification Effects, Causes, and Examples. Most of the desertification that these civilizations experienced was as a result of agriculture, deforestation, and the associated changes in aridity and the climate. As these lands are cultivated the limited nutrients that are available in them are quickly depleted. Often times the land is also improperly irrigated â€" leading to salty soils, and emptied aquifers. As a side note, the Sahara Desert is currently expanding south at a rate of up to 48 kilometers per year. And is well known for its large stone monuments, called moai. Based on current evidence, the island was likely settled by its current Polynesian inhabitants around CE, give or take a few hundred years. Subsequently, agricultural failures occurred, and, also, the ability to build seaworthy ships was lost. The final disappearance of the trees on the island seems to coincide exactly with the large-scale decline of its civilization sometime around the 17th or 18th century. The archeological record clearly shows that the current state of the island is vastly different from what it was at the time of its settlement. Before settlement, the island was nearly entirely forest, with many species of trees that are now extinct there â€" several of which reached heights of over 50 feet. After resources shortages started to begin the population on the island plummeted to around 2,â€"3, â€" from a previous high of approximately 15, It was during this time of crisis that 21 different species of trees, and all of the species of land-birds became extinct. This included at least two species of rails, two species of parrots, and a heron species. As a result of the loss of large trees, the islanders were no longer able to create seaworthy ships. This led to significant changes in their diet, from a diet where previously fish and dolphins had provided abundant protein, to one that was almost completely reliant on farming and domesticated chickens. Previously there had also been an abundant resource in the large land-bird and sea-bird populations on the island, these disappeared shortly after the loss of the ability to fish â€" very likely from over exploitation. As a result of the deforestation, rainfall levels also fell considerably â€" as without trees the evaporation and condensation cycle on the island was greatly weakened. Soil erosion because of lack of trees is apparent in some places. Sediment samples document that up to half of the native plants had become extinct and that the vegetation of the island drastically altered. Polynesians were primarily farmers, not fishermen, and their diet consisted mainly of cultivated staples such as taro root, sweet potato, yams, cassava, and bananas. With no trees to protect them, sea spray led to crop failures exacerbated by a sudden reduction in fresh water flows. There is evidence that the islanders took to planting crops in caves beneath collapsed ceilings and covered the soil with rocks to reduce evaporation. Cannibalism occurred on many Polynesian islands, sometimes in times of plenty as well as famine. Its presence on Easter Island based on human remains associated with cooking sites, especially in caves is supported by oral histories. Extinction And Biodiversity Loss Deforestation has been the cause of a truly massive number of species extinctions in modern times and historical times. Even when the originally deforested area is over time reforested, it always lacks the large biodiversity of its previous state. This has significant implications for the medical and agricultural industries. Many potential medicines â€" and also disease and pest resistant varieties of agricultural crops useful for hybridization â€" have been lost as a result of deforestation. Modern agriculture is now almost entirely dependent on only a very limited number of crops â€" crops which are becoming increasingly lacking in genetic diversity, and, as a result, increasingly susceptible to disease, pests, and climatic changes. With the loss of related wild species much genetic diversity is lost that could potentially be used to address future outbreaks of disease and to increase resiliency. That means that around 50, species are going extinct every year currently. Deforestation considerably increases this rate of soil erosion â€" largely through the actions of increased rainfall runoff and decreased ground debris. Runoff from deforested hillsides increased the amount of silt and impeded the flow of water into agricultural areas. Eventually, due to the Mediterranean climate and the increased depletion of soil nutrients from hundreds of years of harvesting, yields diminished. Rainwater that had been locked into the soil through vegetation and forests was now running off too quickly, with each raindrop unprotected by plants or by a litter layer. As it stands, an estimated 1. Reduced vegetation and ground-cover leads to a general drying-out of the soil â€" which over time leads to lower levels of rain. And, eventually, leads to significant soil erosion and desertification. This loss was at first caused via large-scale burning of the forests by Maori, and then Europeans, but over time logging has risen to become the dominant cause of deforestation in the region. As a result of the deforestation of the islands a great many animal species have gone extinct. This includes all of the known species of Moa â€" a group of giant flightless birds that grew at least as tall as 12 feet, and weighed over lbs. It was a truly massive bird, the largest eagles of today only grow to about half of the size that these birds reached. They were the primary predator of the Moa, and died out around the same time as their primary food source did. During attack they would have reached speeds of up to 50mph, and delivered the force equivalent of a cinder block falling from an eight story building. Interestingly, there are Maori stories that mention a bird that would occasionally kill humans and steal children â€" so the cultural memory is still there, despite the bird being, presumably, gone. A large proportion of this loss has occurred in recent years, and is primarily due to slash-and-burn agriculture. Notably, deforestation has greatly diminished the food resources, soil quality, and fresh water resources available there. This includes eight species of giant elephant-birds, two species of hippopotamus, a very large species of Fossa, a strange unique mammal named Plesiorycteropus, and seventeen species of lemurs. Many of the lemur species that have already gone extinct were much larger than the species still alive â€" with some growing as large as a male gorilla, such as Archaeoindris fontoynontii. Nearly all of the remaining species of lemurs in Madagascar are threatened with extinction, primarily as a result of deforestation. The Dust Bowl was caused by a combination of poor agricultural practices, drought, and deforestation. Before being converted to farmland the region had been primarily grasslands, with some larger vegetation interspersed. The limited tree-cover that had been present before wide-scale settlement was mostly cut down with said settlement. It had functioned to a degree as a natural windbreak and helped to hold together the soil and moisture â€" along with the deep-rooted grasses native to the region. As a result of: Much of the soil ended up deposited in the Atlantic Ocean, carried by prevailing winds.

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Chapter 3 : Wetlands of Louisiana - Wikipedia

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Chapter 4 : Soil Erosion Â– Causes and Effects

An international team of researchers has published a comprehensive new analysis showing that loss of plant biodiversity disrupts the fundamental services that ecosystems provide to humanity.

Resources Soil erosion is a naturally occurring process that affects all landforms. Topsoil, which is high in organic matter, fertility and soil life, is relocated elsewhere "on-site" where it builds up over time or is carried "off-site" where it fills in drainage channels. Soil erosion reduces cropland productivity and contributes to the pollution of adjacent watercourses, wetlands and lakes. Soil erosion can be a slow process that continues relatively unnoticed or can occur at an alarming rate, causing serious loss of topsoil. Soil compaction, low organic matter, loss of soil structure, poor internal drainage, salinisation and soil acidity problems are other serious soil degradation conditions that can accelerate the soil erosion process. This Factsheet looks at the causes and effects of water, wind and tillage erosion on agricultural land. The erosive force of water from concentrated surface water runoff. Water Erosion The widespread occurrence of water erosion combined with the severity of on-site and off-site impacts have made water erosion the focus of soil conservation efforts in Ontario. The rate and magnitude of soil erosion by water is controlled by the following factors: Rainfall and Runoff The greater the intensity and duration of a rainstorm, the higher the erosion potential. The impact of raindrops on the soil surface can break down soil aggregates and disperse the aggregate material. Lighter aggregate materials such as very fine sand, silt, clay and organic matter are easily removed by the raindrop splash and runoff water; greater raindrop energy or runoff amounts are required to move larger sand and gravel particles. Soil movement by rainfall raindrop splash is usually greatest and most noticeable during short-duration, high-intensity thunderstorms. Although the erosion caused by long-lasting and less-intense storms is not usually as spectacular or noticeable as that produced during thunderstorms, the amount of soil loss can be significant, especially when compounded over time. The erosive force of wind on an open field. Surface water runoff occurs whenever there is excess water on a slope that cannot be absorbed into the soil or is trapped on the surface. Reduced infiltration due to soil compaction, crusting or freezing increases the runoff. Runoff from agricultural land is greatest during spring months when the soils are typically saturated, snow is melting and vegetative cover is minimal. Soil Erodibility Soil erodibility is an estimate of the ability of soils to resist erosion, based on the physical characteristics of each soil. Texture is the principal characteristic affecting erodibility, but structure, organic matter and permeability also contribute. Generally, soils with faster infiltration rates, higher levels of organic matter and improved soil structure have a greater resistance to erosion. Sand, sandy loam and loam-textured soils tend to be less erodible than silt, very fine sand and certain clay-textured soils. Tillage and cropping practices that reduce soil organic matter levels, cause poor soil structure, or result in soil compaction, contribute to increases in soil erodibility. As an example, compacted subsurface soil layers can decrease infiltration and increase runoff. The formation of a soil crust, which tends to "seal" the surface, also decreases infiltration. On some sites, a soil crust might decrease the amount of soil loss from raindrop impact and splash; however, a corresponding increase in the amount of runoff water can contribute to more serious erosion problems. Many exposed subsurface soils on eroded sites tend to be more erodible than the original soils were because of their poorer structure and lower organic matter. The lower nutrient levels often associated with subsoils contribute to lower crop yields and generally poorer crop cover, which in turn provides less crop protection for the soil. Slope Gradient and Length The steeper and longer the slope of a field, the higher the risk for erosion. Soil erosion by water increases as the slope length increases due to the greater accumulation of runoff. Consolidation of small fields into larger ones often results in longer slope lengths with increased erosion potential, due to increased velocity of water, which permits a greater degree of scouring carrying capacity for sediment. Plant and residue cover protects the soil from raindrop impact and splash, tends to slow down the movement of runoff water and allows excess surface water to infiltrate. Vegetation and residue combinations that completely cover the soil and intercept all falling raindrops at and close to the surface are the most efficient in controlling soil erosion e. Partially incorporated residues and residual roots are also important as these provide channels that allow surface water to move into the soil. The effectiveness of any protective cover also depends on how much protection is available at various periods during the year, relative to the amount of erosive rainfall that falls during these periods. Crops that provide a full protective cover for a major portion of the year e. Crop management systems that favour contour farming and strip-cropping techniques can further reduce the amount of erosion. Tillage Practices The potential for soil erosion by water is affected by tillage operations, depending on the depth, direction and timing of plowing, the type of tillage equipment and the number of passes. Generally, the less the disturbance of vegetation or residue cover at or near the surface, the more effective the tillage practice in reducing water erosion. Minimum till or no-till practices are effective in reducing soil erosion by water. Tillage and other practices performed up and down field slopes creates pathways for surface water runoff and can accelerate the soil erosion process. Cross-slope cultivation and contour farming techniques discourage the concentration of surface water runoff and limit soil movement. Forms of Water Erosion Sheet Erosion Sheet erosion is the movement of soil from raindrop splash and runoff water. It typically occurs evenly over a uniform slope and goes unnoticed until most of the productive topsoil has been lost. Lighter-coloured soils on knolls, changes in soil horizon thickness and low crop yields on shoulder slopes and knolls are other indicators. The accumulation of soil and crop debris at the lower end of this field is an indicator of sheet erosion. Rill Erosion Rill erosion results when surface water runoff concentrates, forming small yet well-defined channels Figure 4. These distinct channels where the soil has been washed away are called rills when they are small enough to not interfere with field machinery operations. In many cases, rills are filled in each year as part of tillage operations. The distinct path where the soil has been washed away by surface water runoff is an indicator of rill erosion. Gully Erosion Gully erosion is an advanced stage of rill erosion where surface channels are eroded to the point where they become a nuisance factor in normal tillage operations Figure 5. There are farms in Ontario that are losing large quantities of topsoil and subsoil each year due to gully erosion. Surface water runoff, causing gully formation or the enlarging of existing gullies, is usually the result of improper outlet design for local surface and subsurface drainage systems. The soil instability of gully banks, usually associated with seepage of groundwater, leads to sloughing and slumping caving-in of bank slopes. Such failures usually occur during spring months when the soil water conditions are most conducive to the problem. Gully formations are difficult to control if corrective measures are not designed and properly constructed. Control measures must consider the cause of the increased flow of water across the landscape and be capable of directing the runoff to a proper outlet. Gully erosion results in significant amounts of land being taken out of production and creates hazardous conditions for the operators of farm machinery. Gully erosion may develop in locations where rill erosion has not been managed. Bank Erosion Natural streams and constructed drainage channels act as outlets for surface water runoff and subsurface drainage systems. Bank erosion is the progressive undercutting, scouring and slumping of these drainageways Figure 6. Poor construction practices, inadequate maintenance, uncontrolled livestock access and cropping too close can all lead to bank erosion problems. Bank erosion involves the undercutting and scouring of natural stream and drainage channel banks. Poorly constructed tile outlets also contribute to bank erosion. Some do not function properly because they have no rigid outlet pipe, have an inadequate splash pad or no splash pad at all, or have outlet pipes that have been damaged by erosion, machinery or bank cave-ins. The direct damages from bank erosion include loss of productive farmland, undermining of structures such as bridges, increased need to clean out and maintain drainage channels and washing out of lanes, roads and fence rows. Effects of Water Erosion On-Site The implications of soil erosion by water extend beyond the removal of valuable topsoil. Crop emergence, growth and yield are directly affected by the loss of natural nutrients and applied fertilizers. Seeds and plants can be disturbed or completely removed by the erosion. Organic matter from the soil, residues and any applied manure, is relatively lightweight and can be readily transported off the field, particularly during spring thaw conditions. Pesticides may also be carried off the site with the eroded soil. Soil quality, structure, stability and texture can be affected by the loss of soil. The breakdown of aggregates and the removal of smaller particles or entire layers of soil or organic matter can weaken the structure and even change the texture. Textural changes can in turn affect the water-holding capacity of the soil, making it more susceptible to extreme conditions such as drought. Off-Site The off-site impacts of soil erosion by water are not always as apparent as the on-site effects. Eroded soil, deposited down slope, inhibits or delays the emergence of seeds, buries small seedlings and necessitates replanting in the affected areas. Also, sediment can accumulate on down-slope properties and contribute to road damage. Sediment that reaches streams or watercourses can accelerate bank erosion, obstruct stream and drainage channels, fill in reservoirs, damage fish habitat and degrade downstream water quality. Pesticides and fertilizers, frequently transported along with the eroding soil, contaminate or pollute downstream water sources, wetlands and lakes. Because of the potential seriousness of some of the off-site impacts, the control of "non-point" pollution from agricultural land is an important consideration. Under the right conditions it can cause major losses of soil and property Figure 7. Wind erosion can be severe on long, unsheltered, smooth soil surfaces. The rate and magnitude of soil erosion by wind is controlled by the following factors: Soil Erodibility Very fine soil particles are carried high into the air by the wind and transported great distances suspension. Fine-to-medium size soil particles are lifted a short distance into the air and drop back to the soil surface, damaging crops and dislodging more soil saltation. Larger-sized soil particles that are too large to be lifted off the ground are dislodged by the wind and roll along the soil surface surface creep. The abrasion that results from windblown particles breaks down stable surface aggregates and further increases the soil erodibility. Soil Surface Roughness Soil surfaces that are not rough offer little resistance to the wind. However, ridges left from tillage can dry out more quickly in a wind event, resulting in more loose, dry soil available to blow. Over time, soil surfaces become filled in, and the roughness is broken down by abrasion. This results in a smoother surface susceptible to the wind. Excess tillage can contribute to soil structure breakdown and increased erosion. Climate The speed and duration of the wind have a direct relationship to the extent of soil erosion. Soil moisture levels are very low at the surface of excessively drained soils or during periods of drought, thus releasing the particles for transport by wind. This effect also occurs in freeze-drying of the soil surface during winter months. Accumulation of soil on the leeward side of barriers such as fence rows, trees or buildings, or snow cover that has a brown colour during winter are indicators of wind erosion. Unsheltered Distance A lack of windbreaks trees, shrubs, crop residue, etc. Knolls and hilltops are usually exposed and suffer the most. Vegetative Cover The lack of permanent vegetative cover in certain locations results in extensive wind erosion.

Chapter 5 : Coastal Wetlands | Wetlands Protection and Restoration | US EPA

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It may be suitable to simplify this map into smaller zones for some vegetation types. As an example, the Patten Seed company http: This was possible because these grasses are generally adaptable to a broader range of temperatures than other plants, such as flowers, shrubs and trees. The following lists their recommendations for turfgrasses in each of these consolidated areas. Not all of these turfgrasses are suitable for erosion control applications, but this list does illustrate a simplified approach: Area 1 - This area includes lower coastal North Carolina, coastal South Carolina, coastal and south Georgia, all of Florida, and lower and coastal sections of Alabama, Mississippi, Louisiana, and Texas. Area 2 - This zone is north of Area 1 and includes north coastal North Carolina, much of central South Carolina, central Georgia, north and central Alabama, northern Louisiana, south west Tennessee, all except the most northern part of Arkansas, most of central Texas, and the southern portion of Oklahoma. Area 3 - This area covers much of the middle U. Area 4 - This area covers a band of the upper central U. Area 5 - This area covers the upper U. Craig Edminster of Cebeco International Seeds http: This information is specifically for the Pacific Northwest, but many of these grass types are used in other areas of the country. The following is a description of introduced grass species commonly used for erosion control seed mixtures, excerpted from a summary paper by Edminster. This discussion illustrates the importance of proper seed selection and the assistance of an expert. Their key attribute in erosion control is rapid seedling establishment, tolerance to slightly acidic soils and excellent spring, and fall forage growth when rainfall is abundant in the Pacific Northwest. In addition, they serve as an excellent nurse crop in low input plantings. Ryegrass is intolerant of droughty, nutrient deficient soils, and therefore may senescence and die during the early establishment period, which provides an excellent growing environment for long lived, grass species. Lolium perenne Perennial ryegrass tetraploid and diploid sources are commonly used in erosion control plantings. The diploid being more tolerant of grazing pressure mowing and more persistent than the larger leafed, more robust and less cold tolerant tetraploid. Annual ryegrass Lolium multiflorum is the most commonly used cool-season grass in conservation and erosion control in the Pacific Northwest. Annual ryegrass has the best seedling vigor and lowest cost per pound of all the cool season grass species. At low planting rates it can provide good to fair nurse or companion crop attributes. At extremely high seeding rates it can provide living mulch attributes. Annual ryegrass has excellent reseeding capability and seed can remain dormant in soil for up to five years. Therefore, its use is often discouraged where mixed species longevity is desired. Westerwold ryegrass and genetic mixtures containing high percentages of Westerwold germplasm, are readily available in the Pacific Northwest cv Gulf, Oregon Common. Westerwold ryegrass require a very short floral induction period for plant vernalization and results in reseeding potential. Under these circumstances, annual ryegrass can become a weedy grass in erosion control mixtures. True Italian ryegrass cultivars cv Sultan, Total developed in Europe that require significantly more floral induction to induce seed production should be considered as an alternative if annual ryegrass is used. There are six species of fine fescue recognized for their use in turf and forage production systems in the Pacific Northwest. They include, but are not limited to, chewings fescue F. Strong creeping red fescue has been used extensively in conservation and erosion control mixtures primarily because of excellent seedling vigor, tolerance to acidic soils, good shade tolerance understory , and rhizomatous growth habit. Strong creeping red fescue requires very little supplemental fertilization, once established, and grows well on shallow and rocky cut bank riparian and upland sites. Strong creeping red fescue is a moderately tall plant species and is highly compatible with many other tall and short serial species of introduced grass. Timothy Phleum pratense has been used as a minor component in mixtures for wetland, bottomland and stream bank restoration where imperfect soil drainage may be a limiting factor. It is poorly adapted for erosion control mixtures because of its lack of seedling vigor. Therefore, mixtures containing rapid establishing species as a nurse crop are advised. Timothy is also intolerant of drought soils so its establishment on well drained sloped areas in riparian and upland sites is not recommended. Orchardgrass Dactylis glomerata is a bunchgrass that has been used extensively in erosion control mixtures in West Coast Mountain Region. It has good seedling vigor, early spring forage growth, but requires well drained soil sites to persist. It is tolerant of mild soil acidity, and moderately shade tolerant, but requires supplemental fertilizer for proper growth. Orchardgrass cultivars are segregated into different maturity groups early, medium and late for their relative feed value when used in legume-based forage production systems. Early maturing short statured varieties such as Paiute, Palestine are often recommended because they enter dormancy during the summer when soil moisture is depleted in the Pacific Northwest. Upon dehydration in the fall, they regrow and persist. Tall fescue Festuca arundinacea has been used on occasions in conservation and erosion control with mixed results. Tall fescue has poor seedling vigor, but exhibits good shade tolerance. Once established, it is a very dominate forage producer and may require aggressive management to constrain growth mowing, burning. Tall fescue is tolerant of acidic, poorly drained, shallow soil sites, but prefers well drained sandy loam soil sites. In contrast to other cool-season grasses, tall fescue may not enter into summer induced dormancy or rest period. Its deep extensive root system facilitates deep soil profile water uptake during the summer, and tall fescue can dominate a riparian, upland or wetland site. Kentucky bluegrass Poa pratensis has been used to a limited extent in the Pacific Northwest. Its most redeeming characteristic is the presence of rhizomes, which provides good soil and plant interface to reduce soil erosion potential. Its most limiting factors are that it has the poorest seedling vigor of all cool-season grasses and is intolerant of slightly acidic to acidic soils. To persist, it must be established in soils with excellent internal drainage. It also requires moderate to high soil nutrition and does best in a diurnal environment where summers are hot and winters cold. Bentgrass is very tolerant of acidic, poorly drained soils and exhibits fair to poor seedling vigor. If hydrated throughout the season, it can dominate a planting site because of its short, aggressive stoloniferous growth habit. It is therefore incompatible in grass seed mixtures. Established stands of creeping bentgrass will require burning or very short mowing to enhance persistence. Highland bentgrass Agrostis castellana is very tolerant of acidic, poorly drained, or shallow soil sites and exhibits good to fair seedling vigor. It also exhibits better summer drought tolerance than creeping bentgrass. Highland bentgrass has larger more robust stolons than creeping bentgrass, and provides more forage for grazing animals and wildlife. Similar to creeping bentgrass, it can dominate a planting site because of its aggressive stoloniferous growth habit and is therefore considered incompatible in grass seed mixtures. Little colonial bentgrass Agrostis tenuis has been used in conservation and erosion control projects in the Pacific Northwest. This is more the result of short seed supplies than a lack of its adaptation in conservation program. Colonial bentgrass is the only Agrostis species that is compatible in mixture with other cool-season grass species. This short, acid tolerant, fine leaved species has short prolific stolons that grow more upright than prostate. It exhibits excellent drought tolerance, requires only modest soil fertility and has good to fair seedling germination. Single Species Plantings Single species plantings are desired in some cases, but most of the time a mixture is more desirable. Mixtures can be selected that may provide protective cover more quickly and can be more enduring than a single species. Mixtures need not be elaborate. The addition of a quick-growing annual or short lived perennial provides early protection and facilitates establishment of a slower growing and longer living perennial. It is important to evaluate the merits and weakness of each species in selecting the mixtures for the specific site to be treated. The companion crop germinates and grows rapidly, holding the soil until the perennial species becomes established. Seeding rate of the companion crop must be limited to avoid crowding, especially under optimum growing conditions. Plant Species Selection Detailed information on plant species adapted for soil stabilization use in Alabama is contained in the following discussions, and from the Internet sources listed at the end of this chapter. Most of these commercial suppliers of seeds and sod will help select the most appropriate species for local site conditions. Using this information makes plant selection more straight forward for most situations. Specific seeding rates and planting instructions are presented in specifications for local conditions by regulatory agencies. Annuals Annual plants grow rapidly, mature, and die in one growing season. They are useful for quick, temporary cover or as a companion crop for slower growing perennials. Rye cereal is usually superior to other small grains wheat, oats, or barley for temporary cover. It has more cold hardiness than other annuals and will germinate and grow at lower temperatures. It will provide more fall and early winter growth and matures earlier than other small grains. Rye germinates quickly and is tolerant of poor soils. Including rye in fall seeded perennial mixtures is particularly helpful on difficult soils and erodible slopes or when seeding is late. However, seeding rates of rye should be limited to the suggested rates because a thick stand will suppress the growth of the desired perennial seedlings. Rye does grow fairly tall in the spring which may be undesirable. If this is a problem, some of the shorter growing varieties of wheat may be used. Annual ryegrass is not recommended for use as a companion crop in perennial mixtures in Alabama. It is highly competitive and, if included in mixtures, crowds out most other species before it matures in late spring or early summer, leaving little or no lasting cover. It will provide dense cover rapidly, so it can be effective as a temporary seeding, but if allowed to mature, the seed volunteers and can seriously interfere with subsequent efforts to establish permanent cover. Millets Browntop, Foxtail are warm-season annuals, useful for temporary seeding, or as a nurse crop. Browntop millet has early rapid growth, growing two to three feet in height. It is adapted to fine and medium textured soils of moderate productivity. Foxtail is a fine stemmed plant growing to a height of four to five feet. The leaves are broad and flat. Foxtail millets do best under fairly abundant moisture conditions. German millet is a type of foxtail millet.

DOWNLOAD PDF AREA OF VEGETATION LOSS

Chapter 6 : vegetation cover - definition - English

Residents living in the area of Soldier Canyon on the west side of U.S. 70 were advised to begin preparing for the possibility of flooding and stay informed as the weather pattern develops.

Industrial, Urban, and Recreational Impacts A variety of mining practices can severely degrade riparian areas. Depending upon the type, size, and location of the mining operation, total hillsides can be excavated and their stream systems moved or buried. Mining spoils are sometimes deposited along stream channels and can destroy riparian vegetation, particularly if they contain toxic metals such as arsenic, cadmium, chromium, copper, lead, mercury, and zinc. When a mining operation exposes large areas of bare ground, substantial increases in overland flow and sediment production can occur during rainfall. Unless a well-designed and operated system of detention ponds is in place, such runoff may greatly increase sediment delivery to nearby riparian areas. Gold mining in valley bottoms has been particularly detrimental in that all riparian vegetation was removed and soils and underlying gravel substrates were mechanically dredged. Transportation systems have directly and indirectly altered a large number of riparian areas. River transportation has often necessitated the removal of large wood and other obstructions from streambanks. Also significant to riparian systems have been the widespread impacts of channelization, lock construction, and other facets of maintaining these transportation corridors. Road and rail systems have been frequently sited along rivers and lakes, leading to the removal of riparian vegetation from the area occupied by the roadbed, the alteration of topography to provide a roadbed foundation, and local hydrologic modifications to reroute surface water and groundwater. Where sinuous rivers or streams were encountered during highway or railroad construction, portions of the channel were often filled to maintain a straight road alignment at the cost of reduced channel length. Bridges or culverts require the construction of abutments along the bank to provide roadway support. Because the abutments physically constrain the stream, future lateral adjustments by the stream are effectively eliminated. As discussed below for urban development, highway systems and urban roads outside of riparian areas can increase peak overland flow, thus fundamentally altering the hydrologic disturbance regime of adjacent riparian areas. Urbanization and the accompanying increase in impervious surfaces have profoundly modified watershed hydrology and vegetation, and consequently the structure and functioning of riparian areas. As vegetation is replaced by impervious surfaces roads, buildings, parking lots , infiltration, groundwater recharge, groundwater contributions to streams, and stream base flows all decrease, while overland flow volumes and peak runoff rates increase. Stream channels respond by increasing their cross-sectional area to accommodate the higher flows. This channel instability triggers a cycle of streambank erosion and habitat degradation Page 12 Share Cite Suggested Citation: Functions and Strategies for Management. The National Academies Press. Above a certain percent imperviousness approximately 10 to 20 percent , urban stream quality is consistently classified as poor. A secondary effect of urbanization is caused by changes in how overland flow and shallow subsurface flow enter and transverse riparian areas following development. Development promotes the formation of concentrated flows that are less likely to be dispersed within riparian areas, greatly reducing their potential for pollutant removal. For the most part, urbanization and development permanently impair the functioning of riparian areas. Riparian areas are popular sites for recreational activities that can introduce sediment, nutrients, bacteria, petrochemicals, pesticides, and refuse to adjacent water bodies. Effects on riparian soils include trampling by foot, animal, or vehicle traffic that leads to compaction, destruction of soil biota, and increased erosion. Damage to vegetation can be incidental, as through trampling, or deliberate, as in its removal for the construction of recreational facilities or collection of firewood. Animal life can be affected negatively by recreation in riparian areas in ways that include direct disturbance, modification, or destruction of habitat; pollution; or introduction of pathogens. The introduction of exotic plant and animal species for various purposes has had a substantial effect on riparian areas. The most common concern about exotic organisms is their displacement of native species and the subsequent alteration of ecosystem properties. For example, saltcedar has replaced cottonwood and other native riparian trees throughout much of the southwestern United States. This situation has been exacerbated by a reduction in flood flows caused by dams and by the lowering of water tables caused by water withdrawal. Other exotic plants that have become abundant in riparian communities include reed canary grass, buckthorns, scotch broom, Chinese privet, and kudzu. Global climate change could bring about changes to riparian structure and functioning, including the shifting of riparian areas in response to sea-level rise and temperature change. Nonetheless, as significant as climate changes are likely to be, land- and water-use changes have had and will continue to have the greatest effect on riparian areas in the near and medium term. Current Status of Riparian Lands in the United States There have been few assessments of national riparian acreage and only a handful of comprehensive studies on the condition of riparian lands. Current estimates of riparian acreage range from 38 million to million acres. Although the available data are highly variable, it is clear that riparian areas constitute a small fraction of total land area in the United States, probably less than 5 percent. Case histories show that in some areas loss of natural riparian vegetation is as much as 95 percentâ€"indicating that riparian areas are some of the most severely altered landscapes in the country. Page 13 Share Cite Suggested Citation: Less than half of public riparian areas administered by the Bureau of Land Management excluding Alaska are rated as healthy although this reveals little about the condition of riparian areas in the East, where the percentage of public lands is small. Water-quality impairments to , miles of streams 10 percent of the total and to more than 5 million acres of lakes suggest that riparian areas adjacent to impaired streams are suffering similar degradation. Finally, historical trends for wetlands provide clues about trends in riparian lands, given that these areas sometimes overlap. Between and , every state experienced declines in wetland acreage, with greater than 50 percent loss in 22 states. The majority of riparian areas in the United States have been converted or degraded. Although landscape studies assessing the status of riparian areas are limited, they reveal that the spatial extent of riparian forests has been substantially reduced, plant communities on floodplains have been converted to other land uses or have been replaced with developments, and the area of both woody and non-woody riparian communities has decreased. The functions of these riparian areas are greatly diminished in comparison to what occurred historically. There is no comprehensive or methodologically consistent monitoring of trends in riparian areas. It has only been relatively recently that assessments of the areal extent and condition of riparian systems have been undertaken. Given the profound lack of information on riparian land status and trends, a comprehensive and rigorous assessment of riparian coverage is greatly needed. A national program to map riparian areas should incorporate broadly available remotely sensed data, such as satellite multispectral data, which could be used to classify and map land cover and land use information in each of the states. The degree of protection, the focus, and the spatial coverage of laws and programs are highly variable at federal, state, and local levels. A variety of laws offer mechanisms to help protect some riparian areas or aspects of riparian areas. Rather, protection of riparian areas is an indirect consequence of other objectives, such as water-quality protection or habitat management. Five approaches have been used to protect riparian areas, depending on whether the land is publicly or privately owned. First, certain federal laws require the evaluation of adverse effects that would be caused by federal actions, along with consideration of less environmentally damaging alternatives. Such an approach is not specific to riparian areas, nor does it require their protection, but it does ensure attention to their environmental values if they would be potentially affected by a proposed federal action. A second approach is to place special limits on activities in riparian areas on public lands. For example, in the Pacific Northwest, logging and other activities are restricted in riparian reserves that have been established on federal lands in order to protect salmon. A third approach is to regulate activities in privately owned riparian areas. Fourth, incentives such as cost-sharing, low-cost loans, or tax reductions may be used to encourage stewardship on private riparian areas. At the national level, several Farm Bill programs provide incentives for moving intensive agricultural practices away from streams by installing riparian buffers. Fifth, privately owned riparian lands can be purchasedâ€"either in fee or by easementâ€"for public management. For the regulatory and nonregulatory approaches used by the states to address protection of privately owned riparian areas, a significant limitation is that their success is measured by the number of practices implemented and rarely by actual environmental improvements. Because of these uncertain metrics, and because many restoration programs are relatively new, it is difficult to know whether the federal, state, and local programs have been or will be effective in restoring structure and functioning to riparian areas on privately owned land. Interest seems to be growing in the use of conservation easements and other incentives to induce landowners to hold riparian areas as buffers, natural areas, or open space, as well as in the purchase of riparian lands for greenways or wildlife areas. The Total Maximum Daily Load TMDL Program stemming from the Clean Water Act is expected to have a significant impact on riparian areas because many of the TMDL implementation plans being developed call for restoration of riparian areas as a required management measure to achieve needed reductions in nonpoint source pollution. The use and management of public lands and resources are governed by both federal and state laws. The specific federal laws that apply depend on which system e. Each managing agency affords some consideration to riparian areas and resources, whether by regulation or in an internal manual or policy handbook. Few specific provisions for riparian areas have been established in legislation or in executive orders, but agencies have considerable latitude to decide how and to what extent their planning and management activities will account for these areas. One result is that individual districts or units within agencies may vary in their interpretation and implementation of riparian measures established administratively. Thus, while different and additional constraints apply to management of federal riparian lands as compared to privately owned riparian lands, the constraints are not uniform from agency to agency, nor are they even uniformly interpreted and applied within agencies. For the most part, they have been established principally by administrative action, not by legislation, and thus are subject to administrative change. Riparian areas on federal lands are seldom managed as natural systems, though they may receive management attention or protection when they support resources of concern such as wildlife or fisheries and are threatened by certain land uses such as livestock grazing or mining. Federal statutes contain very little guidance for land managers who face conflicts between riparian area protection and permissible land uses. Only if a federal agency proposes an activity in or affecting a riparian area that would jeopardize threatened or endangered species or violate water-quality requirements is riparian area protection clearly required. There are opportunities for protection of riparian areas by extending water rights to instream uses. Current water law in the western states follows the doctrine of prior appropriation, whereby the first to take control of and actively develop and use a water resource holds a protectable legal right to the water against all other claimants. In the eastern states, water rights are afforded to those landowners adjacent to a water body riparian doctrine. Though neither of these systems protects the water needs of streams or their riparian areas, there have been attempts to amend state laws to acknowledge instream water use and afford it water rights. Management guidelines and regulations differ drastically among forest, range, agricultural, residential, and urban lands on private lands. No state has a general land-use law or framework to coordinate management of the landscape for multiple uses e. Although many states have been willing to regulate or manage timber harvesting on private lands in riparian areas, they have not been nearly as willing to restrict other agricultural activities, except in some areas with demonstrated water-quality problems. Instead, the preference has been to induce change in farming practices through incentives provided by programs such as the Conservation Reserve Program, the Conservation Reserve Enhancement Program, and the Water Quality Incentive Program. Page 16 Share Cite Suggested Citation: The broad importance of protecting riparian areas for water quality and fish and wildlife benefits calls for state-level programs of land-use regulation that treat all riparian landowners equally, such as the Massachusetts Riverfront Protection Act. At the very least, states should consider establishing such buffers for sensitive areas as has been done for the Chesapeake Bay. In the absence of a statewide program, local governments should be encouraged to develop riparian buffer zones. Few, if any, federal statutes refer expressly to riparian area values and as a consequence generally do not require or ensure protection of riparian areas. Even the National Wild and Scenic Rivers Act refers only to certain riparian values or resources; it does not consider riparian areas as natural systems, nor does it require integrated river corridor management. Moreover, statutes governing federal land management do not direct agencies to give priority to riparian area protection when conflicts among permissible land uses arise. This absence of a national riparian mandate stands in stark contrast to the existence of a federal wetlands law. Public lands should be managed to protect and restore functioning riparian areas. Federal land management agencies should promulgate regulations requiring that the values and services of riparian areas habitat-related, hydrologic, water quality, aesthetic, recreational under their jurisdiction be restored and protected. At a minimum, agencies should assess the condition of riparian areas, develop and implement restoration plans where necessary, exclude incompatible uses, and manage other uses to ensure their compatibility with riparian area protection. Ideally, Congress should enact legislation that recognizes the myriad values of riparian areas and direct federal land management and regulatory agencies to give priority to protecting those values. Instream flow laws can help protect riparian areas if river and stream flows are managed to mimic the natural hydrograph. Water allocation has historically favored human claims to water over using it for environmental needs.

Chapter 7 : Deforestation Effects, Causes, And Examples: Top 10 List - Science HeathenScience Heathen

There was no measurable change in area of tussock grassland, or of any vegetation types in the areas above meters elevation (montane to alpine zones). The loss of over ha of scrub and shrubland from the lowland areas was partly offset by gains in the coastal and submontane zones.

Chapter 8 : Vegetation for Erosion and Sediment Control

Vegetative filter strips are a broad area of vegetation ranging from 15 to 30 feet wide whose purpose is to remove nutrients, pesticides and sediment from surface runoff.

Chapter 9 : SUMMARY | Riparian Areas: Functions and Strategies for Management | The National Academ

The agricultural plants that often replace the trees cannot hold onto the soil and many of these plants, such as coffee, cotton, palm oil, soybean and wheat, can actually worsen soil erosion. And as land loses its fertile soil, agricultural producers move on, clear more forest and continue the cycle of soil loss.