ALLEY CROPPING

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 311

ALLEY CROPPING
Alley cropping is growing field crops, horticulture crops, or forage crops between rows of trees or shrubs.

PRACTICE INFORMATION
Trees are planted in a single or multiple rows. Row spacing between the "sets" of trees varies according to the farmers objective and the crops grown between the rows of trees.

The tree species are typically selected for their potential value, including the benefits the can provide to the crops grown in the alley areas of the field. Common tree species are black walnut, pecan, green ash, and northern red oak. Other species are also acceptable depending on the climate, value and markets.

All traditional crops can be grown with alley cropping as long as they are compatible with the growth stages of the tree species. Shade is the primary consideration and crops grown in the alleys must be planned accordingly.

Alley cropping is a multipurpose practice that provides one or more of the following benefits:
1. Reduced erosion
2. Enhanced economics
3. Enhanced microclimate for crop production
4. Improved utilization of plant nutrients
5. Improved wildlife habitat
6. Improved landscape aesthetics

Additional information including standards and specifications are on file in the NRCS Field Office Technical Guide.

The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, soil, etc. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

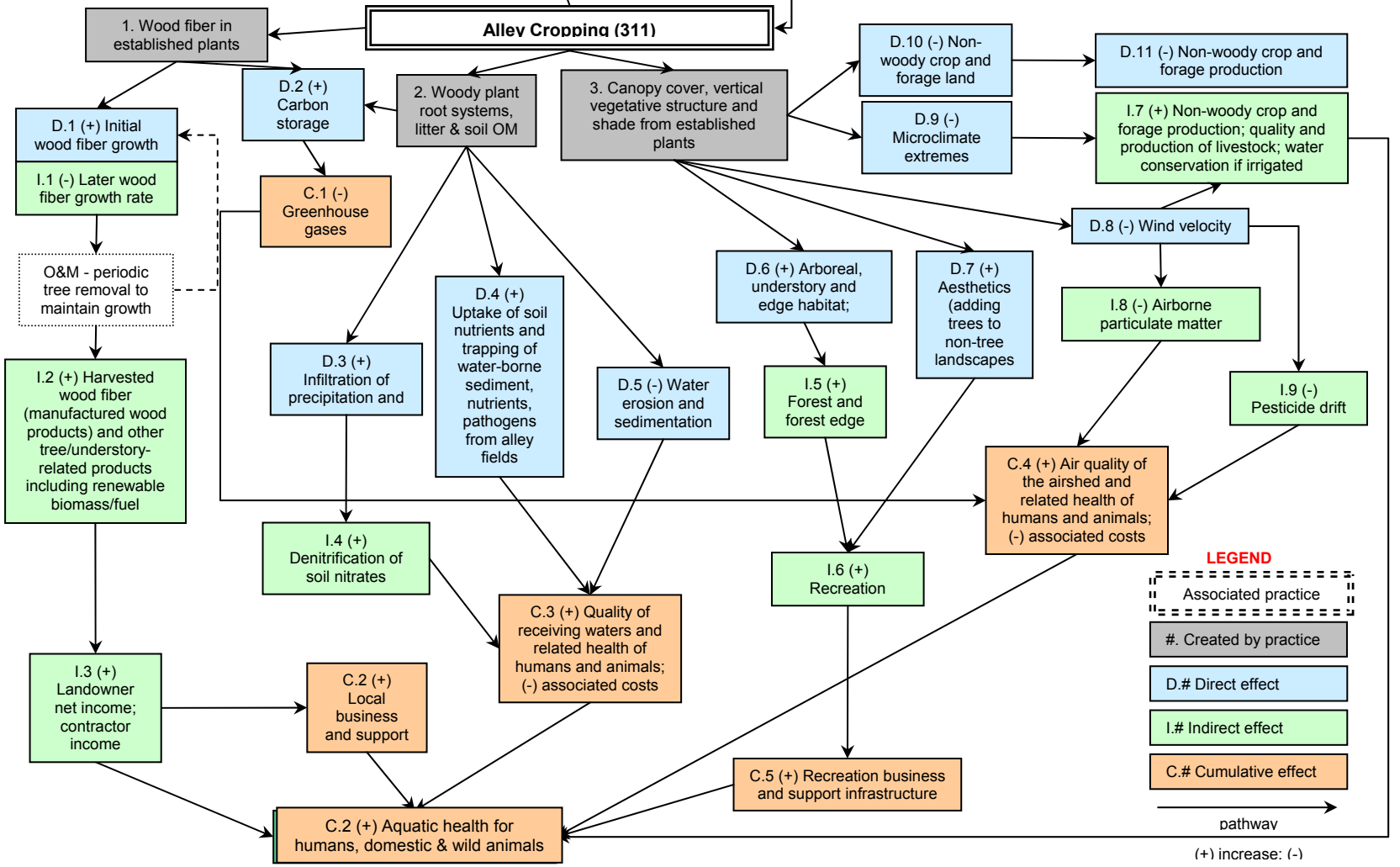
Alley Cropping Practice

5.28.2002

Conservation Crop Rotation (328), Pest Management (595), Nutrient Management (590), etc.*

Initial Setting: Cropland or forage land fields. Field concerns are water and wind erosion, plant stress and lack of woody habitat and products. Sites may be irrigated.

Start



**See individual diagrams for additional detail.*

FIREBREAK

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 394

FIREBREAK
A strip of vegetation or bare land that retards the spread of fire.

PRACTICE INFORMATION
Firebreaks are used to protect soil, water, air, plant, animal and human resources by preventing the spread of wildfires or to control prescribed burns. They consist of fire-resistant vegetation, non-flammable materials, bare ground or a combination of these, and may be temporary or permanent. They will be of sufficient width and length to contain the expected fires.

Vegetated firebreaks will be seeded to non-invasive species that have the characteristics that will slow the spread of a fire.

Bare-ground firebreaks will be established on the contour where practical to minimize the potential for soil erosion.

Existing barriers, such as streams, lakes, roads, field borders, utility rights-of-way or cultivated land, can be used as or incorporated into a firebreak.

The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, soil, etc. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Firebreak Practice

5.28.2002

Initial Setting: Expanses of areas with fuel loadings or flammable conditions that pose a risk of wildfire. Sites are or can be grazed by livestock and wildlife. Sites do not include riparian areas but are connected hydrologically to streams. Sites include those planned for Prescribed Burning.

Start

Firebreak

1. Exposed non-vegetated lanes

2. Breaks in canopy and ground vegetation

D.1 (+/-) Wildlife movement

I.1 (+/-) Wild animal stress

D.4 (+) Landowner cost

D.6 (-) Landowner liability

D.5 (-) Fire hazard and fire frequency

I.3 (-) Wildfire suppression activities and cost

D.7 (+) Livestock access & distribution

Prescribed Grazing (528A)*

I.4 (-) Emissions: embers, particulate matter, CO/CO_2, volatile organics, nitrogen oxide

I.5 (+) Livestock carrying capacity and production

D.2 (+) Recreational access

D.3 (+) Contractor income

C.3 (-) Greenhouse gases

C.4 (+) Air quality of the airshed

C.6 (+) Livestock business & support infrastructure

I.2 (+) Surface erosion, runoff, sediment and airborne particulate

C.1 (+) Recreation business & support infrastructure

C.2 (+) Local business support infrastructure

C.5 (+) Related health for humans and animals; (-) associated costs

Mitigated by Critical Area Planting (342), Sediment Basin (350), Structure for Water Control (587), Use Exclusion (472),

I.6 (+) Quality of receiving waters and

C.7 (+) Income stability (individuals & community)

**See individual diagrams for additional*

LEGEND

- Associated practice
- #. Created by practice
- D.# Direct effect
- I.# Indirect effect
- C.# Cumulative effect
- pathway
- (+) increase; (-)

FOREST SITE PREPARATION

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 490

FOREST SITE PREPARATION
Forest site preparation is the practice of treating areas to encourage natural regeneration of desirable trees and shrubs or to accelerate the process by providing optimum site conditions for planting or direct seeding of desirable woody species.

PRACTICE INFORMATION
This practice applies to understocked areas, areas planned for tree planting following harvest, areas where a land cover change to forest is desired, or areas having undesirable vegetation that inhibits or competes with preferred woody species.

The purpose of the practice is to prepare the land for establishing a stand of desirable woody vegetation by controlling undesirable vegetation, removing slash and debris, or altering site conditions.

Application of this practice requires the following considerations:

1. Protect existing desirable vegetation
2. Remaining slash and debris should not harbor harmful levels of pests, hinder needed equipment operation, or create undue fire hazard.
3. Accelerated erosion and/or runoff caused by site preparation will be controlled by other conservation practices.
4. The chosen method should be cost effective, and protect culture resources, springs, seeps, wetlands, and other unique areas.
5. Impacts on wildlife habitat should be carefully evaluated as part of the planning process.

Additional information including specifications for this practice are filed in the local NRCS Field Office Technical Guide.

The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, soil, etc. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Forest Site Preparation Practice
Tree/Shrub Establishment Practice

5.28.2002

Initial Setting: 1) Non-forested sites capable of producing wood fiber and forest habitat; or 2) cutover forestland. Both settings lack woody biomass of desired species.

Start

Forest Site Preparation (490)

1. Competing vegetation eliminated in whole or part

D.2 (+) Prepared sites for planting or seeding

Tree/Shrub Establishment (612)

2. Woody biomass of desired species, canopy and vertical vegetative structure

D.1 (+) Exposed areas; loss of habitat; release of desired tree species

I.1 (+) Undesired plant regrowth

I.2 (+) Desired plant regrowth

I.3 (+) Carbon storage

D.3 (+) Initial wood fiber growth rate

I.4 (-) Later wood fiber growth rate

C.2 (-) Greenhouse gases

C.3 (+) Air quality in the airshed

C.4 (+) Related health of humans and animals; (-) associated costs

C.5 (+) Income stability (individuals & community)

D.4 (+) Surface erosion, runoff, sediment and airborne particulate matter

D.5 (-) Wildlife habitat

I.4 (+) Wildlife habitat

I.5 (-) Surface erosion, runoff & sediment production

I.6 (+) Quality of receiving waters and airshed

C.1 (+) Related health of humans and animals; (-) associated costs

Mitigated by Critical Area Planting (342), Sediment Basin (350), Use Exclusion (472), etc.*

Forest Stand Improvement (666), Forest Trails and Landings (655), Access Roads (560), etc.*

LEGEND

- Associated practice
- #. Created by practice
- D.# Direct effect
- I.# Indirect effect
- C.# Cumulative effect
- pathway
- (+) increase; (-) decrease

**See individual diagrams for additional detail.*

FOREST STAND IMPROVEMENT

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 666

FOREST STAND IMPROVEMENT
To manipulate species of trees by cutting or killing selected trees and understory vegetation.

PRACTICE INFORMATION
This practice applies to forest land where competing vegetation hinders development and stocking of preferred tree and understory species. The preferred species are identified and retained to achieve the intended purpose of improving the stand. Spacing, density and amounts of preferred plants are carefully planned. Consideration is given to the total ecosystem. Timing of treatment and retaining dead or dying trees will help minimize impacts on nesting birds and other wildlife. Food and cover for wildlife are further retained by minimal modifications of composition and spacing necessary to improve the vegetative cover considering the total natural resource base. Purposes of this practice include the following:

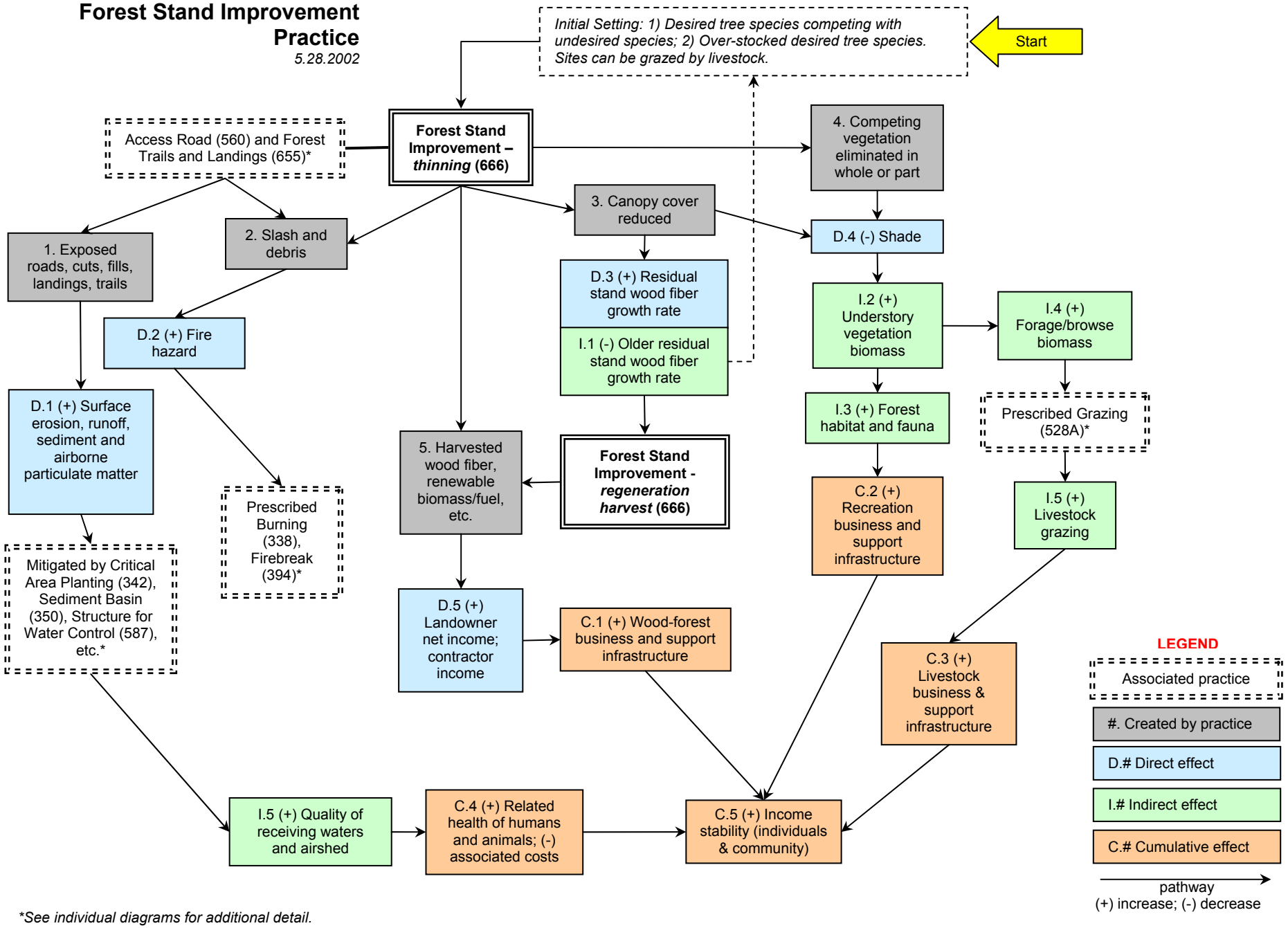
1. Improve or sustain timber production
2. Improve understory forage production, aesthetics, wildlife habitat, recreation, and hydrologic condition.
3. To harvest forest products
4. To initiate sorest stand regeneration.
5. To achieve a combination of purposes

Additional information including standards and specifications for establishment and management of this practice are on file in the local NRCS Field Office Technical Guide.

The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, soil, etc. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Forest Stand Improvement Practice

5.28.2002



**See individual diagrams for additional detail.*

FOREST HARVEST TRAILS AND LANDINGS

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 655

FOREST HARVEST TRAILS AND LANDINGS Laying out, constructing, and using forest trails and landings.

PRACTICE INFORMATION
Forest trails and landings are installed prior to a scheduled harvest to provide a location to assemble and transport harvested logs. The conservation objective is to minimize onsite and offsite damage to the other natural resources.

Planning and application of this practice requires the following considerations:

1. Timing and use of equipment will be planned so that site productivity is maintained and soil disturbance is held to a minimum.
2. Slash, debris and vegetative material left onsite should not present an unacceptable fire or pest hazard.
3. Water bars, dips and other drainage measures for trails should be properly designed.
4. Trails and landings need to be seeded to grass to help control erosion
5. Consider planting vegetation that provides wildlife food and cover
6. Trails and landings should be located to preserve the aesthetic quality of the area.
7. Police trails and landings to remove refuge and garbage.
8. Consider closing the trails after harvest to help control erosion and reduce maintenance costs.

Additional information including design criteria and specifications are on file in the local NRCS Field Office Technical Guide.

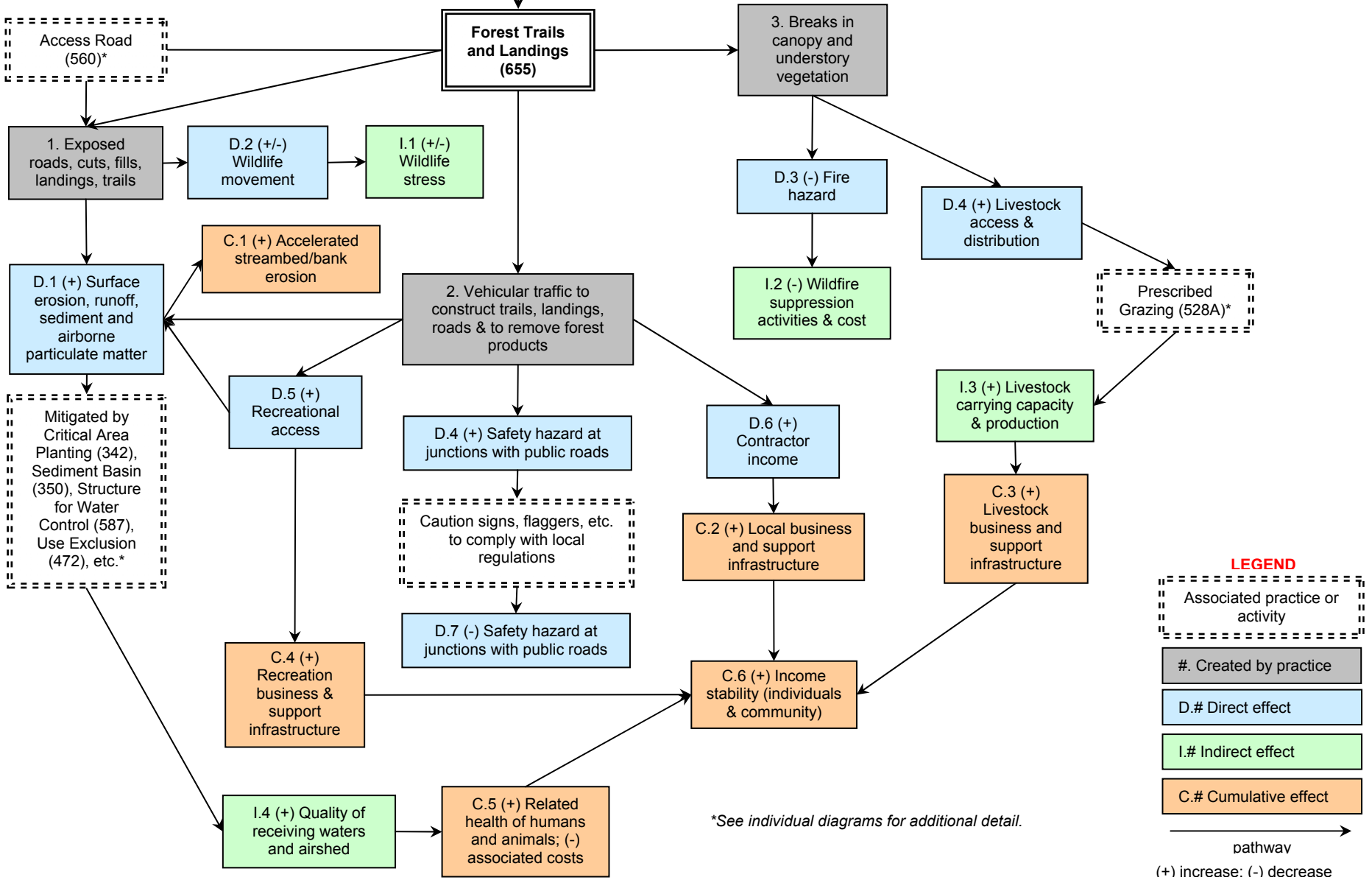
The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, soil, etc. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Forest Harvest Trails and Landings Practice

5.28.2002

Initial Setting: A forest stand that is or will be partially or block harvested. Sites are or can be grazed by wildlife. Sites do not include riparian areas but are connected hydrologically to streams.

Start



**See individual diagrams for additional detail.*

LEGEND

- Associated practice or activity
- #. Created by practice
- D.# Direct effect
- I.# Indirect effect
- C.# Cumulative effect
- pathway

(+) increase; (-) decrease

PRESCRIBED BURNING

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 338

PRESCRIBED BURNING
Prescribed Burning is applying controlled fire to a predetermined area of land.

PRACTICE INFORMATION
This practice applies to all land uses for the following purposes:

- To control undesirable vegetation.
- Prepare sites for planting or seeding.
- Control plant diseases.
- Reduce wildfire hazards.
- Improve wildlife habitat.
- Improve forage quantity and quality.
- Slash and debris removal following forest management activities.
- Enhance seed / seedling production.
- To facilitate distribution of grazing and browsing animals.

Safety precautions are carefully planned before the burn and monitored during the burn. Existing barriers such as streams, lakes, roads, wetlands, and constructed firebreaks, are important considerations in planning the practice.

This is a highly specialized practice that requires intensive training and sufficient support personnel and equipment.

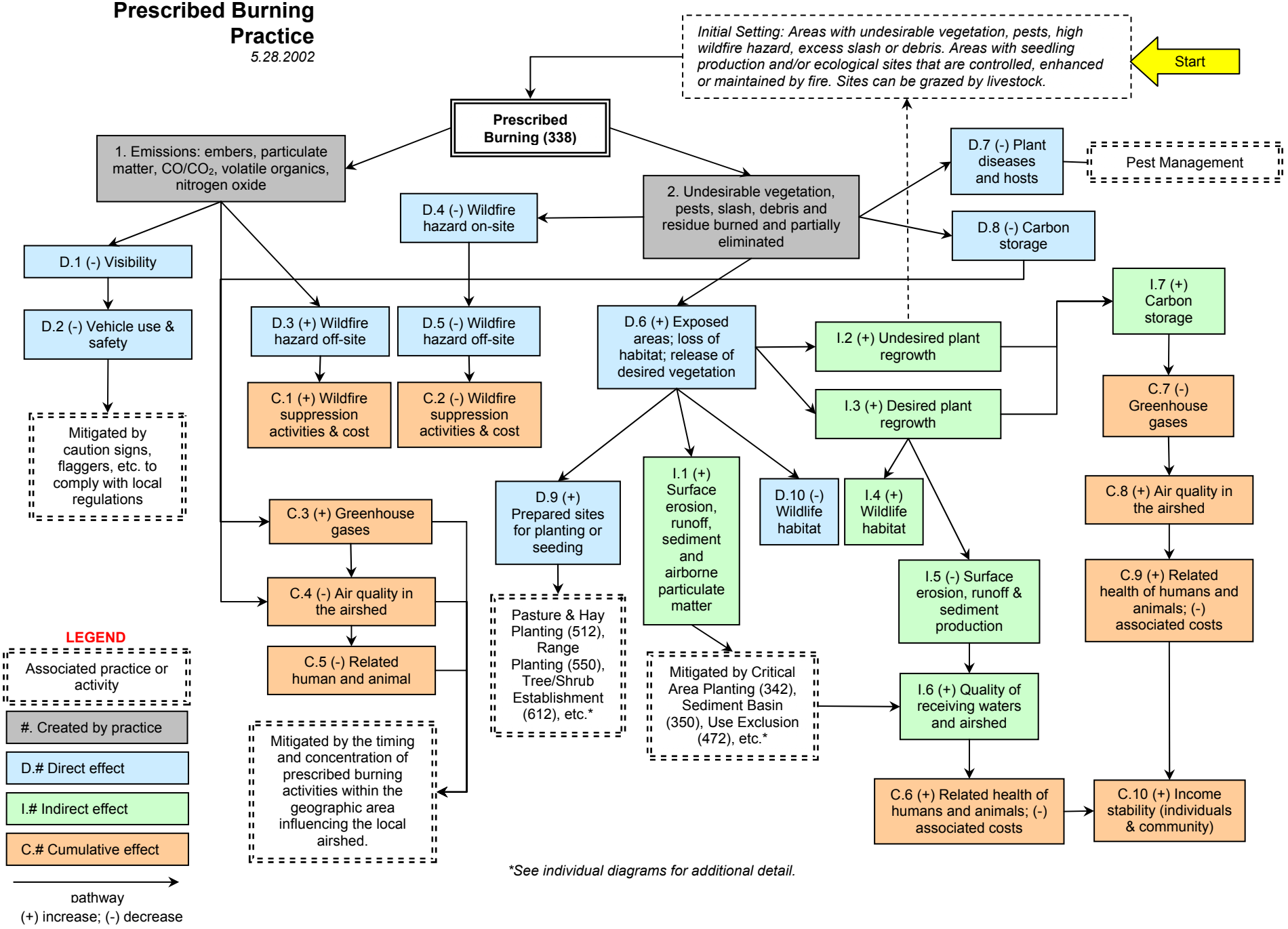
A safe successful burn must be timed for proper humidity, wind conditions, air temperature, and fuel conditions (ignitable vegetation).

Additional information including design criteria and specifications are in the local NRCS Field Office Technical Guide.

The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, and soil. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Prescribed Burning Practice

5.28.2002



RIPARIAN FOREST BUFFER

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 391

RIPARIAN FOREST BUFFER
A riparian forest buffer is an area of trees and/or shrubs located adjacent to a body of water. The vegetation extends outward from the water body for a specified distance necessary to provide a minimum level of protection and/or enhancement.

PRACTICE INFORMATION
This practice applies to areas adjacent to permanent or intermittent streams, lakes, ponds, wetlands and areas associated with ground water recharge.

The riparian forest buffer is a multi-purpose practice design to accomplish one or more of the following:

1. Create shade to lower water temperatures and improve habitat for aquatic animals.
2. Provide a source of debris necessary for healthy robust populations of aquatic organisms and wildlife.
3. Act as a buffer to filter out sediment, organic material, fertilizer, pesticides and other pollutants that may adversely impact the water body, including shallow ground water.

Dominant vegetation consists of existing or planted trees and shrubs suited to the site and purpose (s) of the practice. Grasses and forbs that come in naturally further enhance the wildlife habitat and filtering effect of the practice.

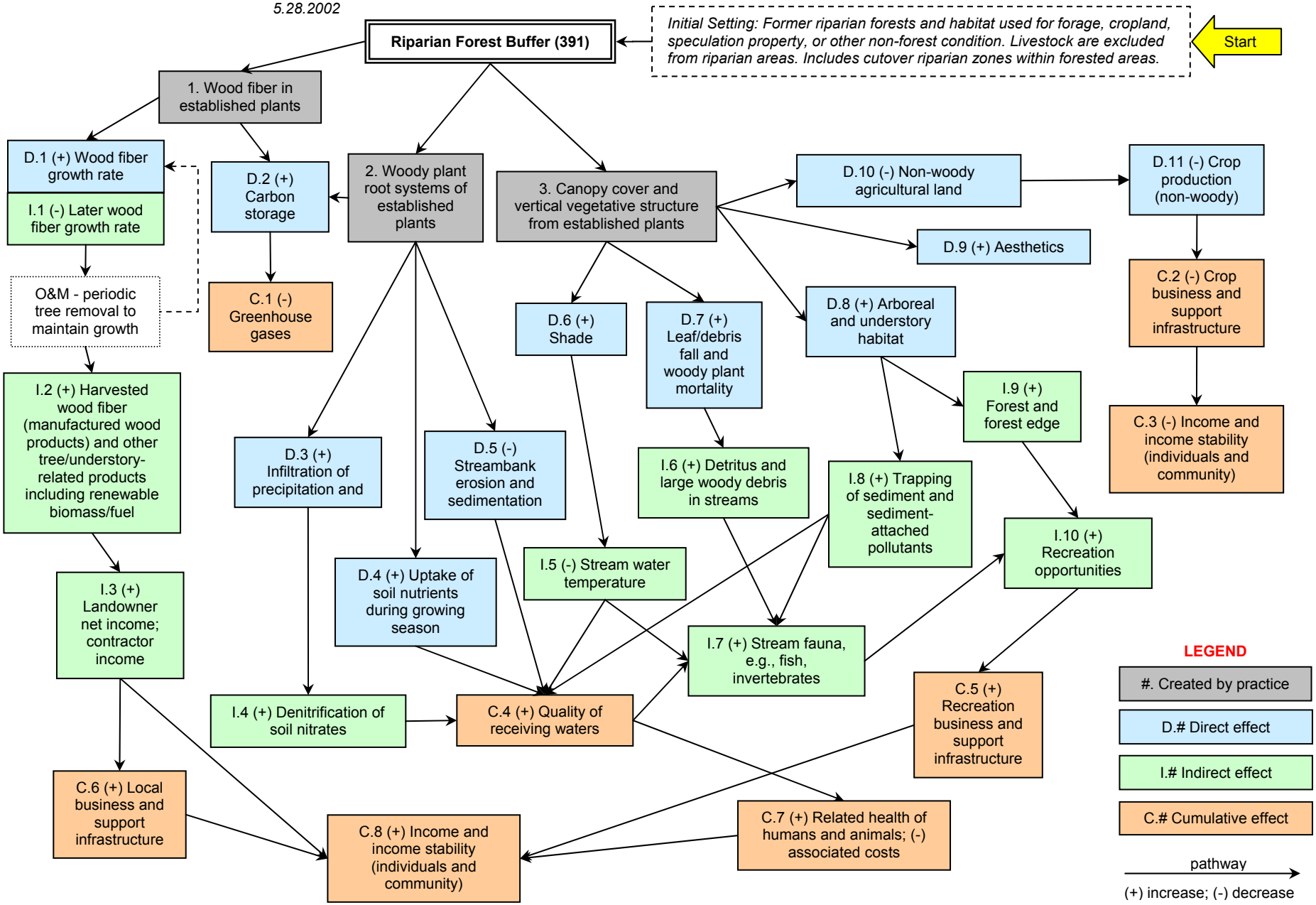
Headcuts and streambank erosion should be assessed and treated appropriately before establishing the riparian forest buffer.

Specifications for each installation are based on a thorough field investigation of each site.

The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, soil, etc. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Riparian Forest Buffer Practice

5.28.2002



TREE/SHRUB ESTABLISHMENT

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 612

TREE/SHRUB ESTABLISHMENT
Tree and Shrub Establishment is establishing woody plants by planting or seeding.

PRACTICE INFORMATION
The purposes of the practice include:

- Forest products
- Beautification
- Erosion control
- Energy conservation
- Chemical/Nutrient sink for water quality improvements
- Wildlife habitat improvement
- Air quality improvements
- Wetland improvements

This practice is applicable on any area of land where woody plants are suited. Site adaptation is a major consideration for success in establishing trees and shrubs. Careful consideration should also be given to the suitability of the selected species for the planned purpose and available space for growth.

Additional information including design criteria and specifications are in the local NRCS Field Office Technical Guide.

The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, and soil. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Forest Site Preparation Practice
Tree/Shrub Establishment Practice

5.28.2002

Initial Setting: 1) Non-forested sites capable of producing wood fiber and forest habitat; or 2) cutover forestland. Both settings lack woody biomass of desired species.

Start

Forest Site Preparation (490)

1. Competing vegetation eliminated in whole or part

D.2 (+) Prepared sites for planting or seeding

Tree/Shrub Establishment (612)

2. Woody biomass of desired species, canopy and vertical vegetative structure

D.1 (+) Exposed areas; loss of habitat; release of desired tree species

I.1 (+) Undesired plant regrowth

I.2 (+) Desired plant regrowth

I.3 (+) Carbon storage

D.3 (+) Initial wood fiber growth rate

I.4 (-) Later wood fiber growth rate

C.2 (-) Greenhouse gases

C.3 (+) Air quality in the airshed

C.4 (+) Related health of humans and animals; (-) associated costs

C.5 (+) Income stability (individuals & community)

D.4 (+) Surface erosion, runoff, sediment and airborne particulate matter

D.5 (-) Wildlife habitat

I.4 (+) Wildlife habitat

I.5 (-) Surface erosion, runoff & sediment production

I.6 (+) Quality of receiving waters and airshed

C.1 (+) Related health of humans and animals; (-) associated costs

Mitigated by Critical Area Planting (342), Sediment Basin (350), Use Exclusion (472), etc.*

Forest Stand Improvement (666), Forest Trails and Landings (655), Access Roads (560), etc.*

LEGEND

- Associated practice
- #. Created by practice
- D.# Direct effect
- I.# Indirect effect
- C.# Cumulative effect
- pathway
- (+) increase; (-) decrease

**See individual diagrams for additional detail.*

TREE/SHRUB PRUNING

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 660

TREE/SHRUB PRUNING
Tree or shrub pruning is removing all or parts of selected branches from trees and shrubs.

PRACTICE INFORMATION
The purpose of the practice is to improve the function, appearance, and quality of the plants. Safety is also a reason for pruning trees and shrubs.

This practice applies to crop trees of high value as well as trees planted for aesthetics, wildlife, recreation, windbreaks, and other purposes.

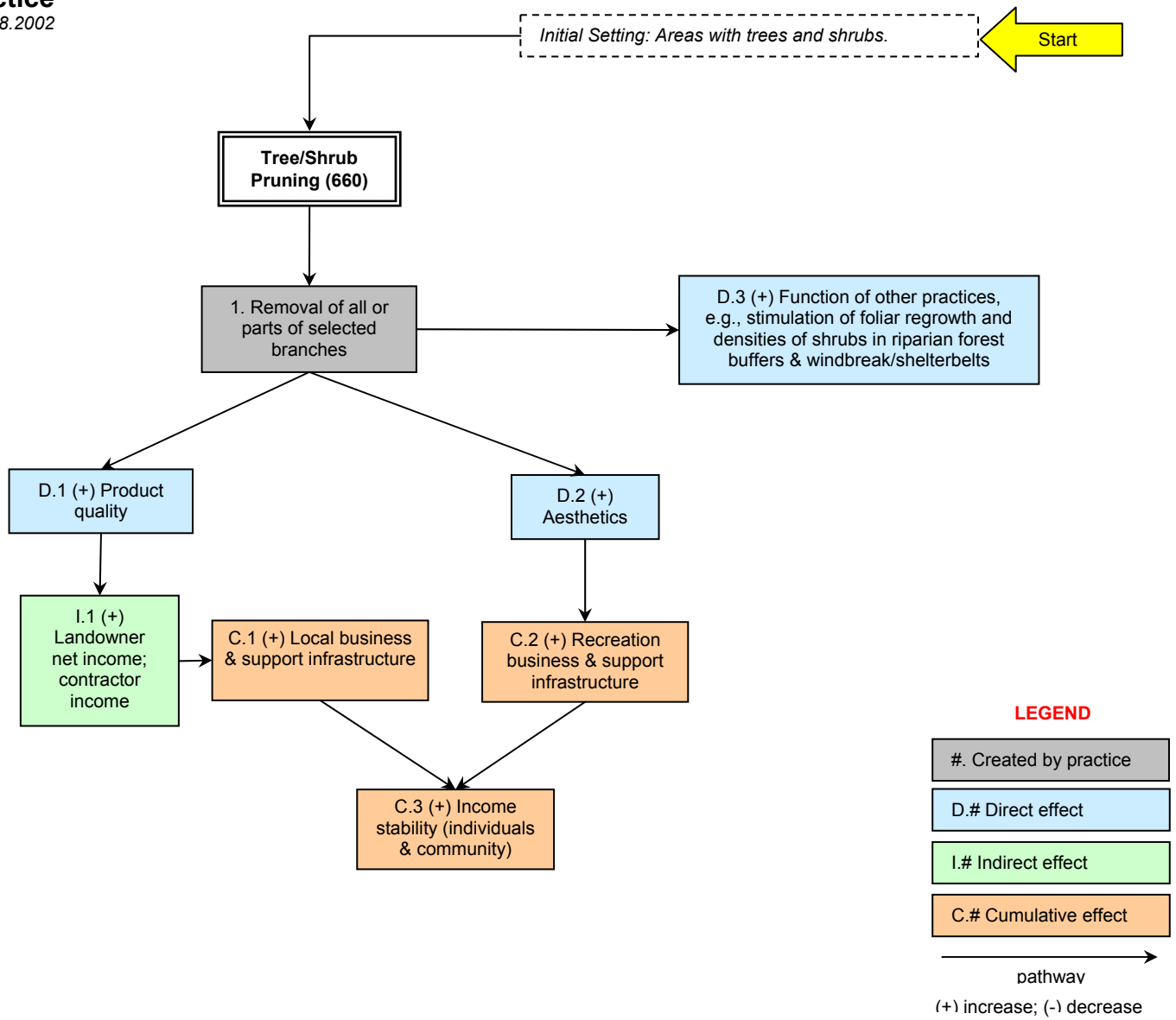
The timing of the pruning operation should be appropriate to the growth characteristics of the plants. In addition, nesting and breeding requirements of birds should be considered. Other wildlife species may or may not be adversely affected by pruning. In urban areas, special attention must be given to safety precautions.

Additional information including design criteria and specifications are in the local NRCS Field Office Technical Guide.

The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, and soil. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Tree/Shrub Pruning Practice

5.28.2002



USE EXCLUSION

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 472

USE EXCLUSION
Use Exclusion is excluding animals, people or vehicles from an area.

PRACTICE INFORMATION
The purpose of Use Exclusion is to protect, maintain, or improve the quantity and quality of the natural resources in an area. The purpose also includes aesthetic resources as well as human health and safety.

The practice is used in a conservation plan in areas where vegetation establishment or maintenance is a concern. Protecting the vegetation is often essential to conserving the other natural resources.

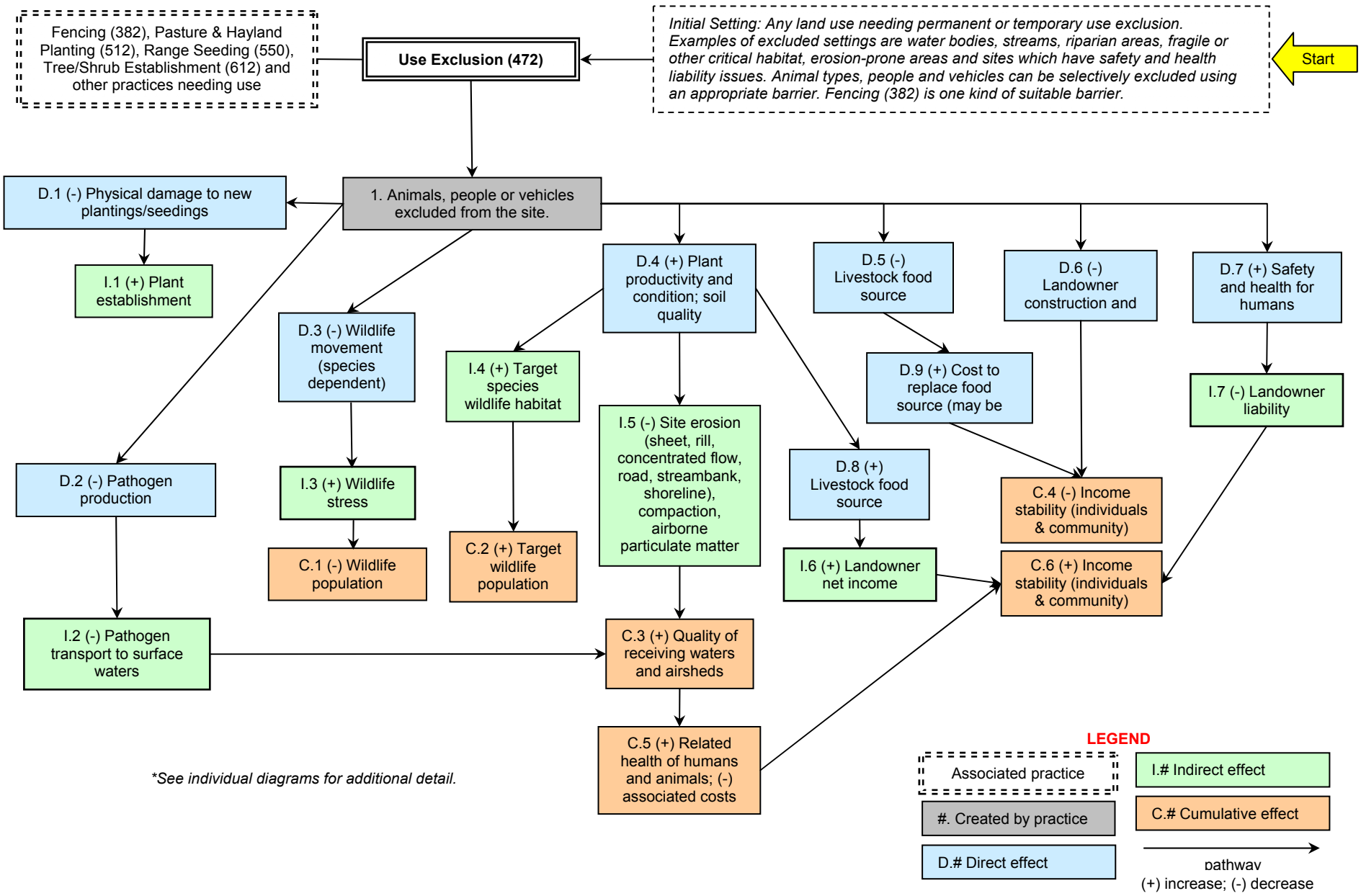
The barriers constructed for Use Exclusion must be adequate to prevent intrusion of the target animals, vehicles or people. The barriers are usually fences, but may also be natural and artificial structures such as logs, boulders, earth fill, gates, signs, etc.

Additional information including design criteria and specifications are in the local NRCS Field Office Technical Guide.

The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, and soil. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Use Exclusion Practice

5.28.2002



WINDBREAK/SHELTERBELT ESTABLISHMENT

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 380

WINDBREAK/SHELTERBELT ESTABLISHMENT

Windbreaks and shelterbelts are single or multiple rows of trees or shrubs planted for environmental purposes.

PRACTICE INFORMATION

This practice can be used in any area where woody plants are suited. The specie, location, layout, and density of the planting depends on the purpose and planned function of the practice.

In areas where natural precipitation is too low for establishment of suitable woody species, moisture conservation or supplemental irrigation should be planned.

The effectiveness of a windbreak or shelterbelt is dependent on the height of the mature plants. Therefore, this is a long term proposition that may take 20 years to become fully functional.

This is a multipurpose practice that will serve one or more of the following functions:

1. Reduce wind erosion
2. Protect growing plants
3. Manage snow
4. Provide shelter for structures and livestock
5. Provide wildlife food and cover
6. Provide tree or shrub products
7. Provide living screens
8. Improve aesthetics
9. Improve moisture use efficiency

Additional information including standards and specifications for this practice are available in the NRCS Field Office Technical Guide.

The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, soil, etc. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

WINDBREAK/SHELTERBELT RENOVATION

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 650

WINDBREAK/SHELTERBELT RENOVATION

Renovation involves widening, partial replanting, releasing, removing, and replacing selected trees and shrubs to improve an existing windbreak or shelterbelt.

PRACTICE INFORMATION

This practice is used to enhance the function of an existing windbreak or shelterbelt. The trees and shrubs may deteriorate due to age, chemical damage, competition, lack of maintenance, or other reasons. When this happens, renovation is needed to increase vigor and density of desirable species of trees and shrubs.

A period of years may be needed to properly renovate a windbreak or shelterbelt.

Additional information including standards and specifications are available in the NRCS Field Office Technical Guide.

The following page identifies the conservation effects expected to occur when this practice is applied. These effects are subjective and somewhat dependent on variables such as climate, terrain, soil, etc. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Windbreak/Shelterbelt Establishment and Renovation Practices

5.28.2002