Appendix D

AMA PRACTICE EFFECTS: PRACTICE PHOTO, DESCRIPTION AND NETWORK DIAGRAMS

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ANIMAL TRAILS AND WALKWAYS

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - Practice code 575

ANIMAL TRAILS AND WALKWAYS
Animal trails and walkways provide a travel lane through difficult or ecologically sensitive terrain.

PRACTICE INFORMATION This practice is installed on grazing lands as part of a conservation plan to accomplish one or more of the following:

1. Improve access to forage, water and /or shelter.
2. Improve grazing efficiency and distribution.
3. Divert travel away from ecologically sensitive and/or erosive sites.

Trails or walkways are often needed where animal movement is impeded or restricted because of steep rough terrain, rock outcrops, dense vegetation, water, etc.

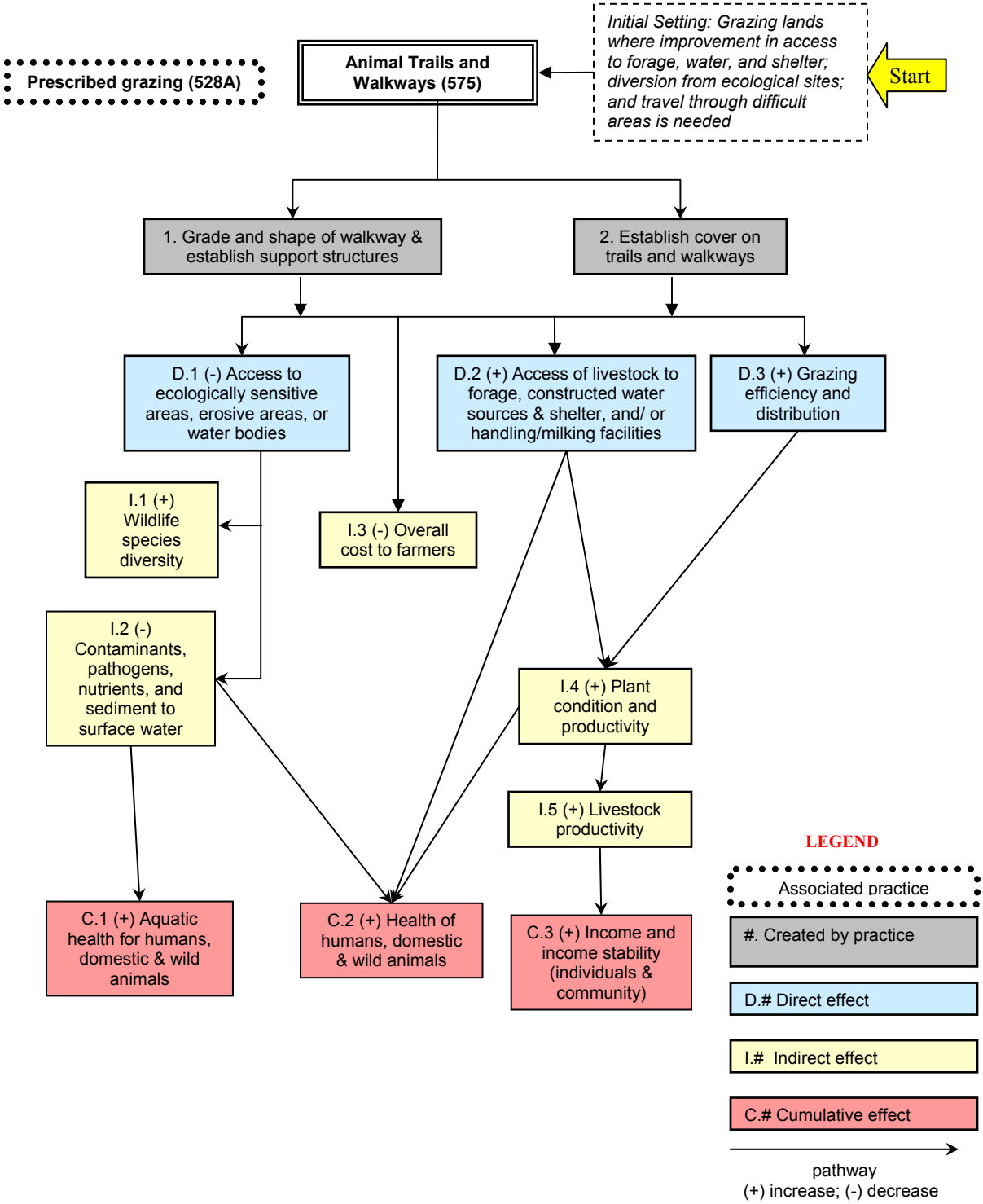
Detailed design criteria is available on the NRCS national practice standard. To familiarize you with the general concept, the following practice criteria is Provided:

1. The structures will be wide enough for livestock movement and vehicles.
2. Soil erosion will be minimized during construction.
3. Supporting structures for water management will be provided.
4. Walkways will be constructed based on normal high water levels.
5. Walkway borrow pits will be staggered to provide access to grazing areas on either side of the structure.

The following page identifies the 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.

Animal Trails and Walkways Practice

Version 5.29.02



CONTOUR BUFFER STRIPS

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 332

CONTOUR BUFFER STRIPS
Contour buffer strips are strips of perennial grass alternated with wider cultivated strips that are farmed on the contour.

PRACTICE INFORMATION
The benefits of farming on the contour with the added protection from the grass strips make contour buffer strips an effective and cost efficient conservation practice.

Contour buffer strips slow runoff water and trap sediment. Consequently, soil erosion is general reduced significantly by this practice. Sediments, nutrients, pesticides, and other potential pollutants are filtered out as water flows through the grass strips. The grass strips also provide food and cover for wildlife.

The practice is not well suited for undulating terrain with steep irregular slopes where contouring is impractical.

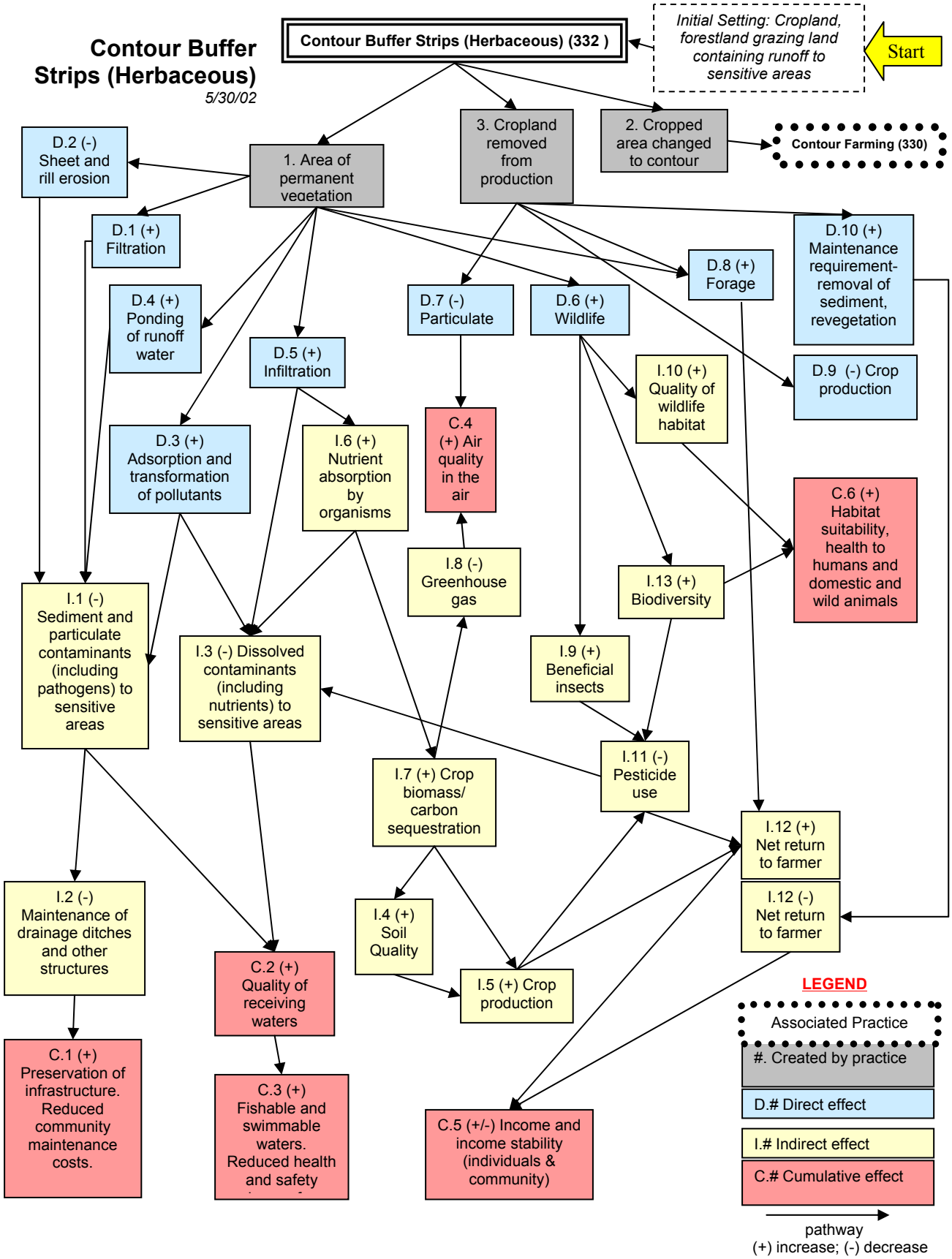
The effectiveness of contour buffer strips is dependent on several variables such as steepness, soil type, crops grown, strip widths, management, and climatic factors.

Standards and specifications containing minimum requirements, including maintenance, are included in the USDA/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.

Contour Buffer Strips (Herbaceous)

5/30/02



COVER CROP

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 340

COVER CROP
Growing a crop of grass, small grain or legumes primarily for seasonal protection and soil improvement.

PRACTICE INFORMATION
Cover and green manure crops are grown on cropland, orchards, vineyards, and certain recreation and wildlife areas where seasonal benefits of a cover crop are needed. These crops are usually plowed under or desiccated to accommodate the primary crop being produced on the site.

This practice is used to control erosion, add fertility and organic material to the soil, improve soil tilth, and increase infiltration and aeration of the soil. In orchards, this practice is also used to increase populations of bees for pollination purposes.

In addition, cover and green manure crops have beneficial effects on water quantity and quality.

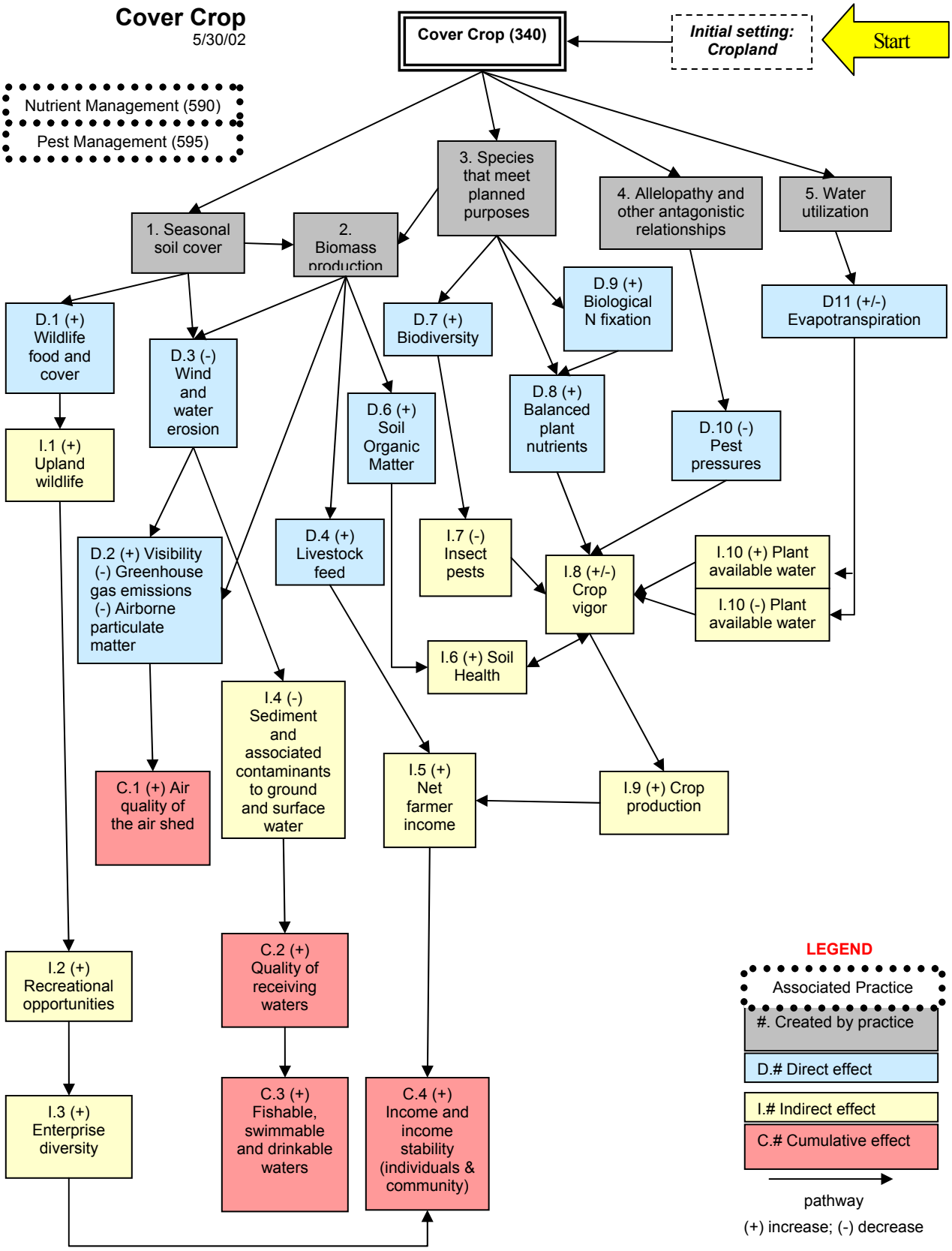
Cover crops have a filtering effect on movement of sediment, pathogens, and dissolved and sediment-attached pollutants.

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.

Cover Crop

5/30/02



CRITICAL AREA PLANTING

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 342

CRITICAL AREA PLANTING
Planting vegetation on critically eroding areas that require extraordinary treatment.

PRACTICE INFORMATION
This practice is used on highly erodible areas that cannot be stabilized by ordinary planting techniques and if left untreated may cause severe erosion or sediment damage. Examples of critical areas include the following:

1. Dams, dikes, levees, and other construction sites with very steep slopes.
2. Mine spoil and surface mined land with poor quality soil and possibly chemical problems.
3. Agriculture land with severe gullies requiring specialized planting techniques and management.

Erosion control is the primary consideration for plant material selection. However, a broad choice of grass, trees, shrubs, and vines are usually available and adapted for most sites. Wildlife and beautification are additional considerations that influence planning decisions on a site needing this practice.

The following decisions must be made when planning this practice:

1. Function or use of the site following establishment.
2. Species of plants to establish
3. Methods and rates of planting
4. Fertilizer, lime, and soil amendments necessary for establishment and growth of the plants.
5. Mulching requirements
6. Planting site preparation
7. Irrigation requirement
8. Site management following establishment of the vegetation.

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

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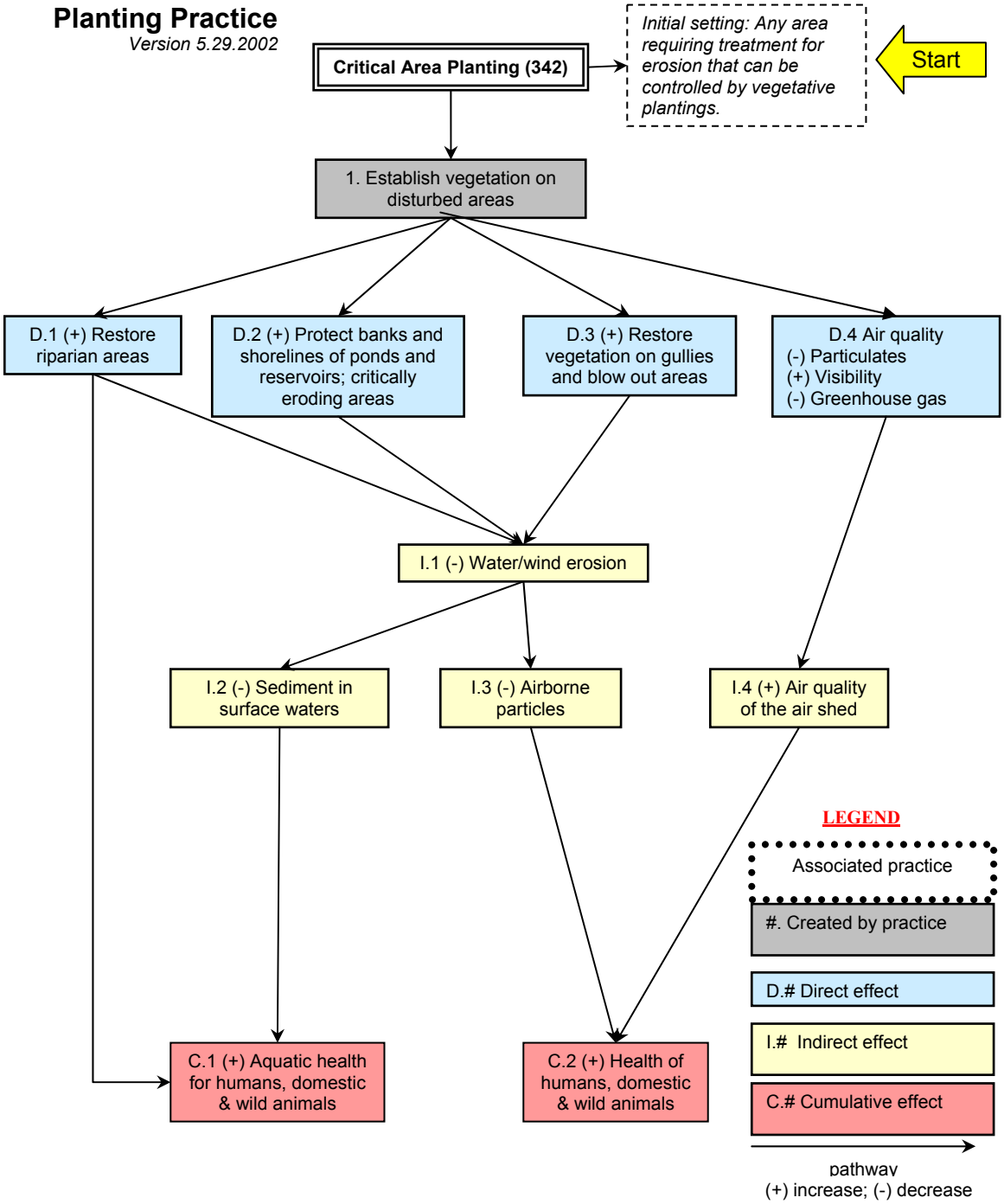
Critical Area Planting Practice

Version 5.29.2002



DIVERSION

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 362

DIVERSION
A channel constructed across the slope with a supporting ridge on the lower side.

PRACTICE INFORMATION
This practice applies to all types of diversions except floodwater diversions (400) and diversion dams (348). The general purpose of this type of diversion is to divert excess water from one area for use or safe disposal in other areas.
This practice applies to sites where:

1. Runoff damages cropland, grazing land, farmsteads, feedlots, or conservation practices such as terraces or stripcropping.
2. Surface flow and/or shallow subsurface flow caused by seepage is causing damage on sloping cropland.
3. Runoff is excessive and available for use on nearby sites.
4. A diversion is required as part of a pollution abatement system.
5. A diversion is required to control erosion and runoff on urban or developing areas and construction or mining sites.

The channel may be parabolic, V-shaped, or trapezoidal. The channel grades may be uniform or variable as long as the velocity is nonerosive considering the soil and planned vegetation or lining. The location of the diversion shall be determined by outlet conditions, topography, land use, farming operations, and soil type. Diversion layout in a cultivated field should be as compatible as practical with modern farm equipment.

Diversions must have a safe and stable outlet with adequate capacity. The outlet may be a grassed waterway, paved area, vegetated area, a grade stabilization structure, a stable watercourse, underground outlet, or a combination of these structures. The outlet must be able to convey the runoff to a point where outflow will not cause damage.
If the outlet is a vegetated area, the vegetation must be established before constructing the diversion.

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

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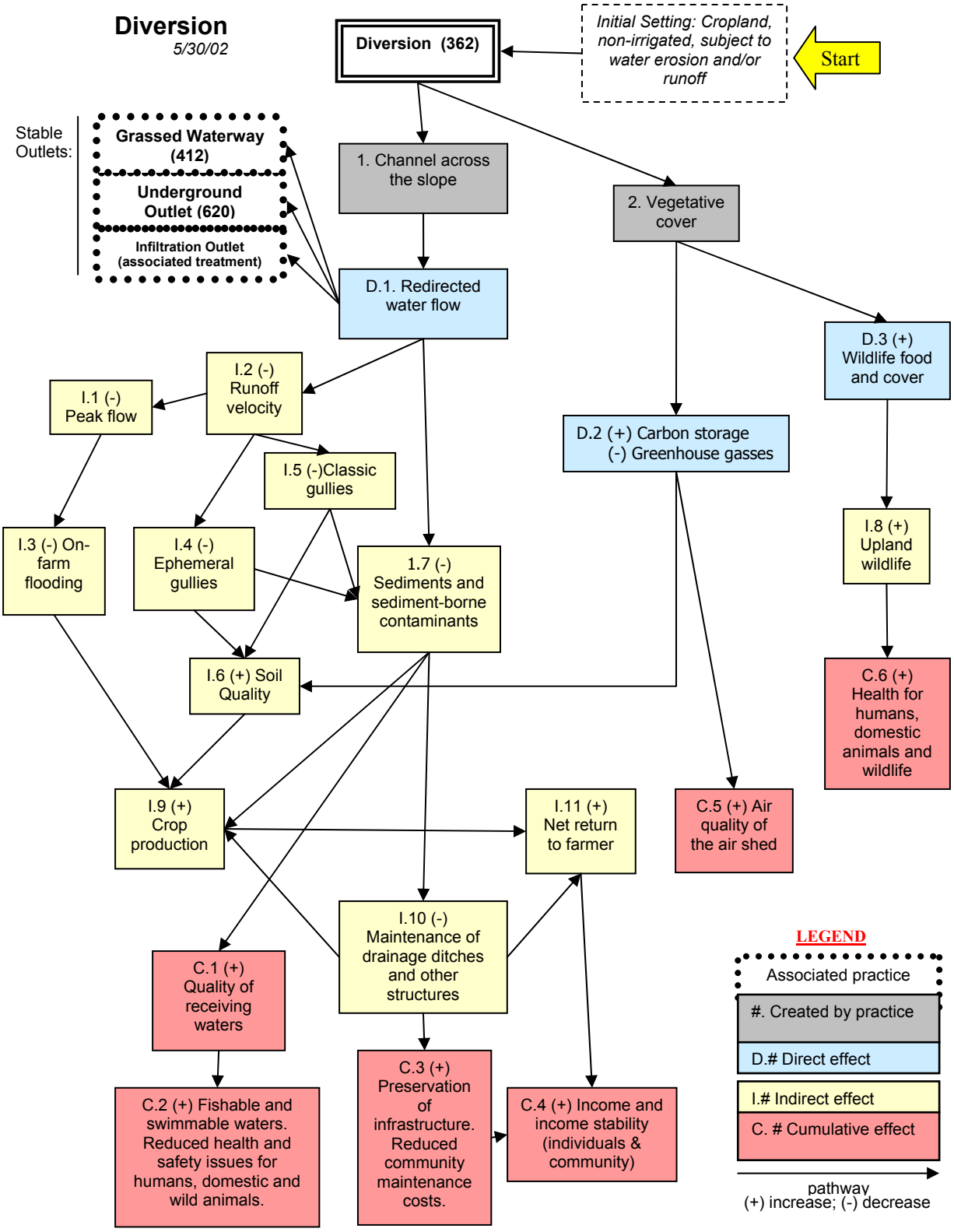
Diversion

5/30/02



FENCE

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 382

FENCE
A fence is a constructed barrier to livestock, wildlife, or people.

PRACTICE INFORMATION
This practice may be applied to any area where livestock and /or wildlife control is needed, or where access to people is to be regulated.

A wide variety of types of fencing has developed. However, fencing material and construction quality is always designed and installed to assure the fence will meet the intended purpose and longevity requirements of the project.

The standard fence is constructed of either barbed or smooth wire suspended by posts with support structures. Other types include woven wire for small animals, electric fence as a cost efficient alternative, and suspension fences which are designed with heavy but widely spaced posts and support structures. Designs for most types of fences are available at the local NRCS field office.

Things to consider when planning a fence include the following:

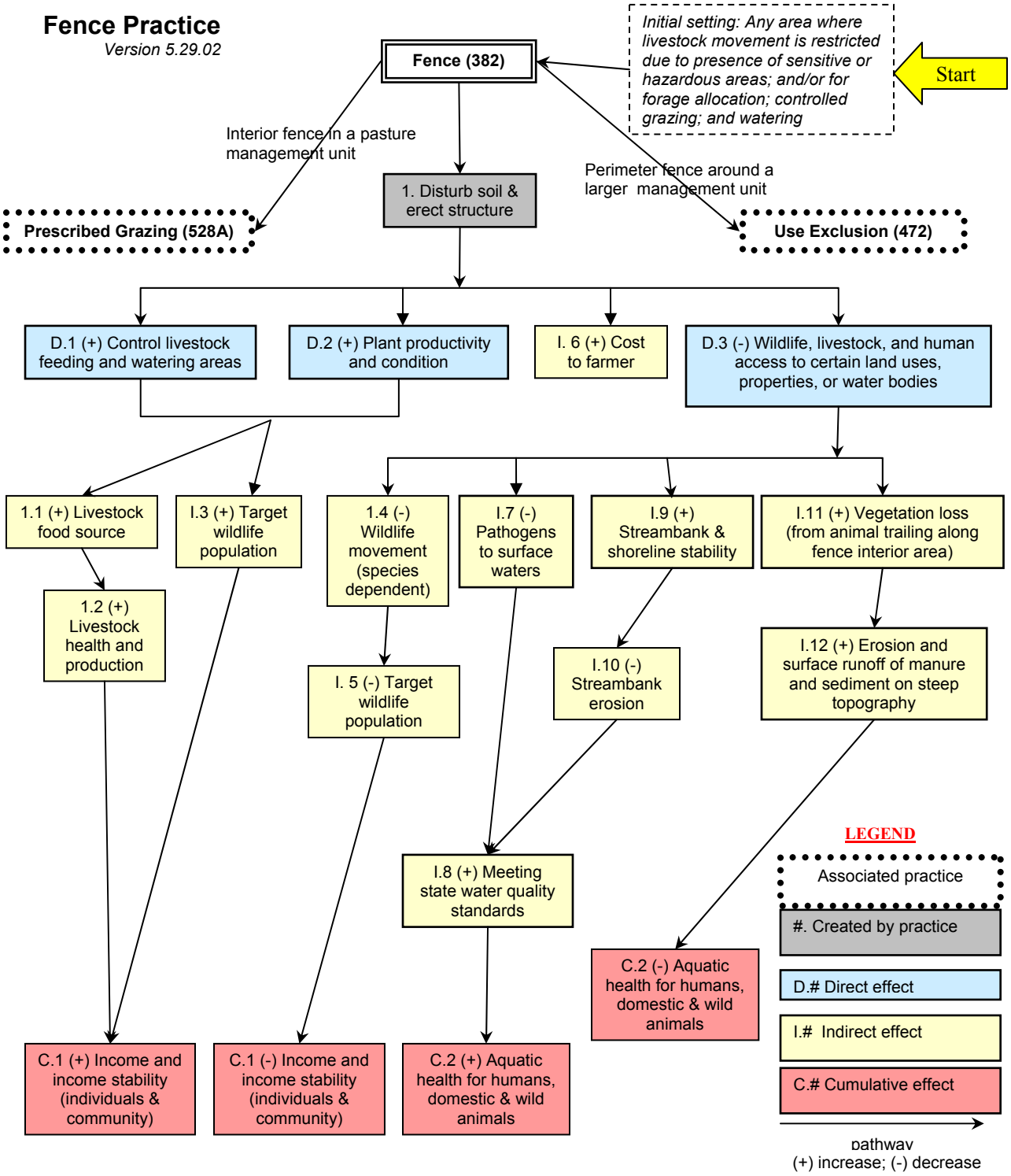
1. For ease of maintenance purposes avoid as much irregular terrain as possible.
2. Wildlife movement needs should be considered.
3. State and local laws may apply to boundary fences.
4. Consider livestock handling, watering and feeding requirements when locating fences
5. Consider soil erosion potential and feasibility of fence construction when planning fences on steep or irregular terrain.

Additional information including designs and construction specifications are available 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.

Fence Practice

Version 5.29.02



FILTER STRIP

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 393

FILTER STRIP
A filter strip is an area of vegetation established for the purpose of removing sediment, organic material, and other pollutants from runoff and waste water.

PRACTICE INFORMATION

Filter strips are generally located at the lower edge (s) of a field. This will vary somewhat with land use, topography and objectives.

A filter strip removes pollutants from runoff before the material enters a body of water. It also serves as a buffer between water and the fields above the water so that pesticides and other chemicals are not applied directly adjacent or into the water body.
Filter strips also reduce sedimentation of streams, lakes and other bodies of water.

Plant species selected for planting in a filter strip requires careful planning. There may be multiple objectives that can be accomplished by proper plant selection.

In addition to the above functions, filter strips can be designed to provide one or more of the following secondary benefits:
1. Improved fish and wildlife habitat.
2. Improved aesthetics
3. Improved equipment operations such as field access and turn rows or head lands.
4. Improved recreation opportunities.
5. Improved livestock forage source.

Specifications for design and installation of this practice are contained in the USDA/NRCS Field Office Technical Guide.

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Filter Strip

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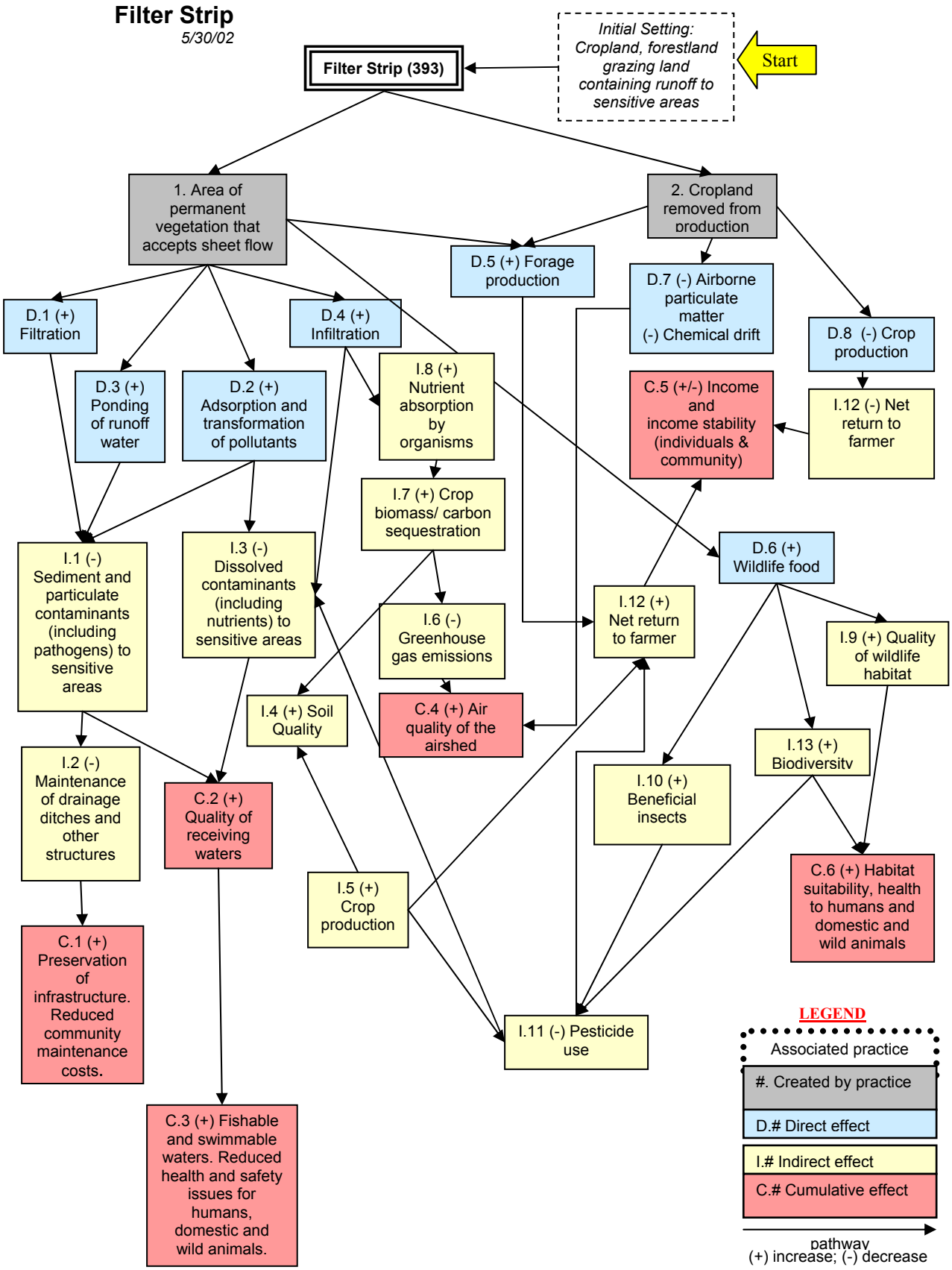

IRRIGATION SYSTEM, MICRO-IRRIGATION (TRICKLE)

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 441

IRRIGATION SYSTEM, MICRO-IRRIGATION

Micro-irrigation is an irrigation system for distribution of water directly to the plant root zone by means of surface or subsurface applicators. A trickle system is a planned system in which all necessary components have been installed for efficient application of irrigation water directly to the root zone of the plants by means of emitters, orifices, or porous tubing.

PRACTICE INFORMATION

Microirrigation systems, including subsurface drip irrigation, consists of bubblers, drip or trickle emitters and tapes, or spray or spinners.

Trickle irrigation refers to irrigation water being applied by means small diameter pipes and very low volume orifices or emitters that apply the water directly to the plant root zone. This method of irrigation is very efficient and is normally utilized on a commercial basis when water is in short supply or very expensive. Microirrigation is suited to orchard and row crops, windbreaks, greenhouse crops, and residential and commercial landscape systems and on steep slopes where other methods would cause excessive erosion or on areas where other application devices interfere with cultural operations. The trickle method of irrigation in particular, is suited more for orchards, vineyards, and specialty crops. This method is also well suited for home gardens and systems are often automated with electric solenoids and timers. However, as water shortages develop trickle irrigation has potential for most field crops.

A trickle irrigation system must be designed as an integral part of a conservation plan based on the capabilities of the natural resources and the needs of the farm enterprise. The planned system must be suited to the site conditions and the crops to be grown.

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, soil, etc. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Irrigation System, Micro-Irrigation Practice

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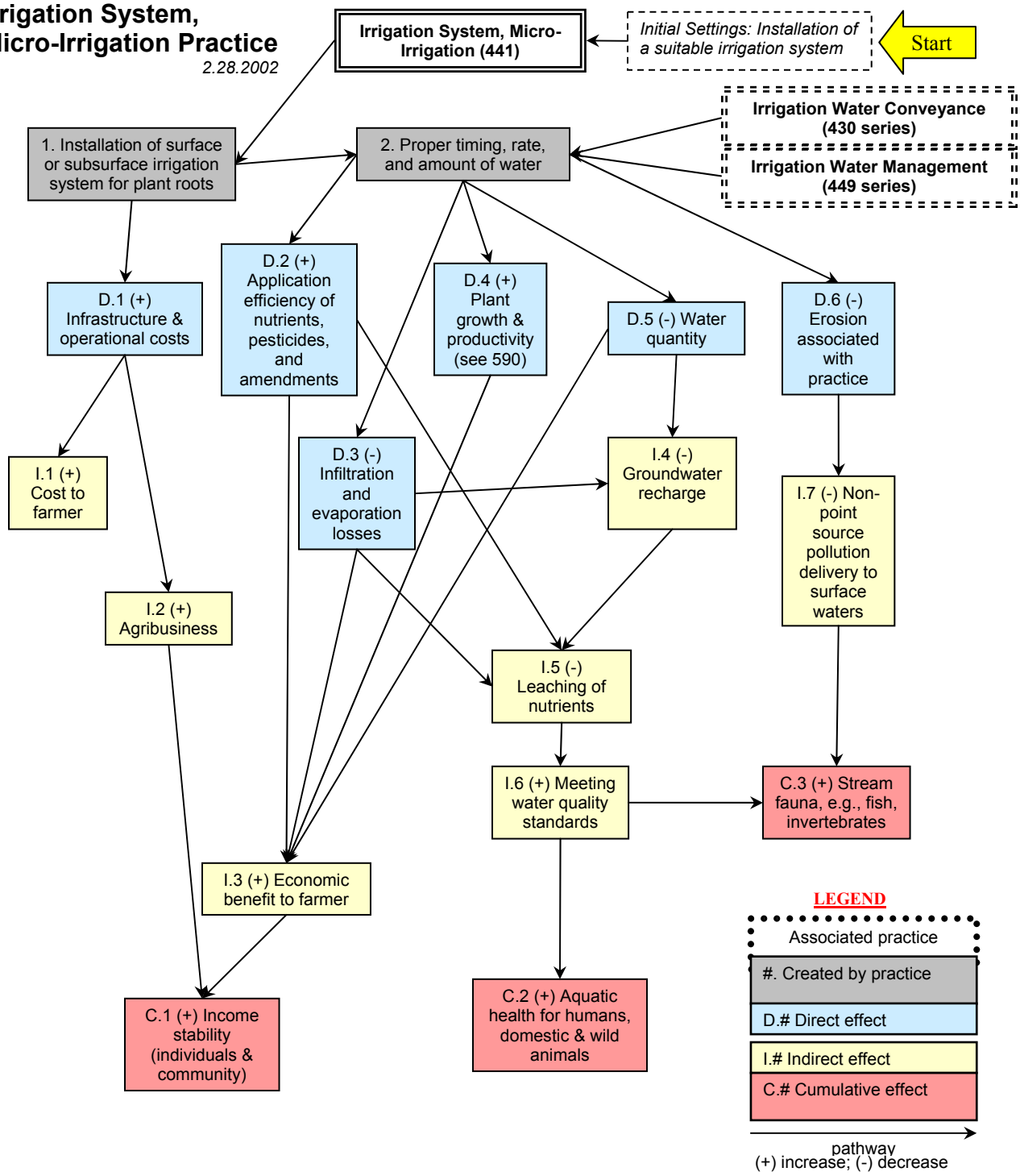


PASTURE AND HAY PLANTING

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 512

PASTURE AND HAY PLANTING
Establish native or introduced forage species.

PRACTICE INFORMATION
This practice may be applied on cropland, hayland, pastureland, or other agriculture lands where forage production is planned.

This practice is used for on or more of the following purposes:

1. Provide forage for livestock and/or wildlife.
2. Improve or maintain livestock nutrition and/or health.
3. Provide additional forage to fill gaps in a year long forage management program.
4. Provide emergency forage.
5. Reduce soil erosion, improve aesthetics, provide wildlife food and cover, improve water quality, and other environmental benefits.

Plant species recommendations for this practice are based on the following considerations:

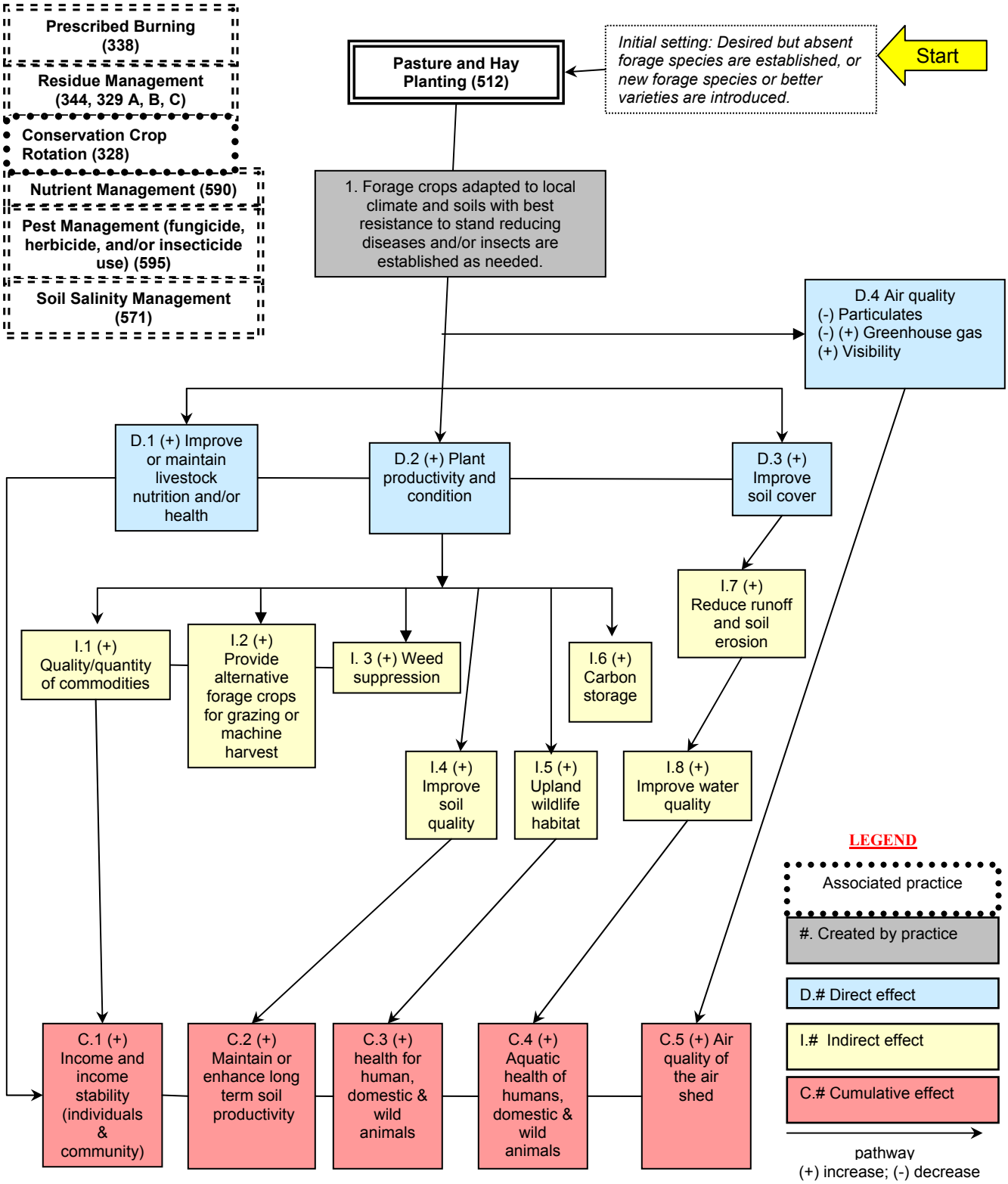
1. Climatic conditions such as annual rainfall, growing season days, humidity, and temperature extremes.
2. Site conditions including soil series, soil condition, flooding hazards, drainage, salinity, inherent fertility, slope, toxic elements, and other attributes associated with the specific site.
3. Plant resistance to pests common to the site.
4. Period of growth (cool vs. warm season)
5. Others

Recommended species, seeding dates, seeding rates, seedbed preparation requirements, planting methods, and other technical requirements are provided 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.

Pasture and Hay Planting Practice

Version 5.29.02



PIPELINE

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 516

DEFINITION
The NRCS pipeline practice is used when a pipeline is needed to convey water for livestock, recreation or wildlife.

PRACTICE INFORMATION
The purpose of this practice is simply to convey water from the source of supply to the point (s) of use. The objective is usually to decentralize the location of drinking or water storage facilities. The practice is applicable where water needs to be piped to another location (s) for management purposes, to conserve the supply, or for reasons of sanitation.

Pipelines installed under this practice are generally for livestock management purposes. A single water source can provide livestock water to several locations and be very effective in improving management of a grazing unit.

Pipelines are also used on recreation and wildlife lands to provide or distribute drinking water facilities for humans as well as wildlife.

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

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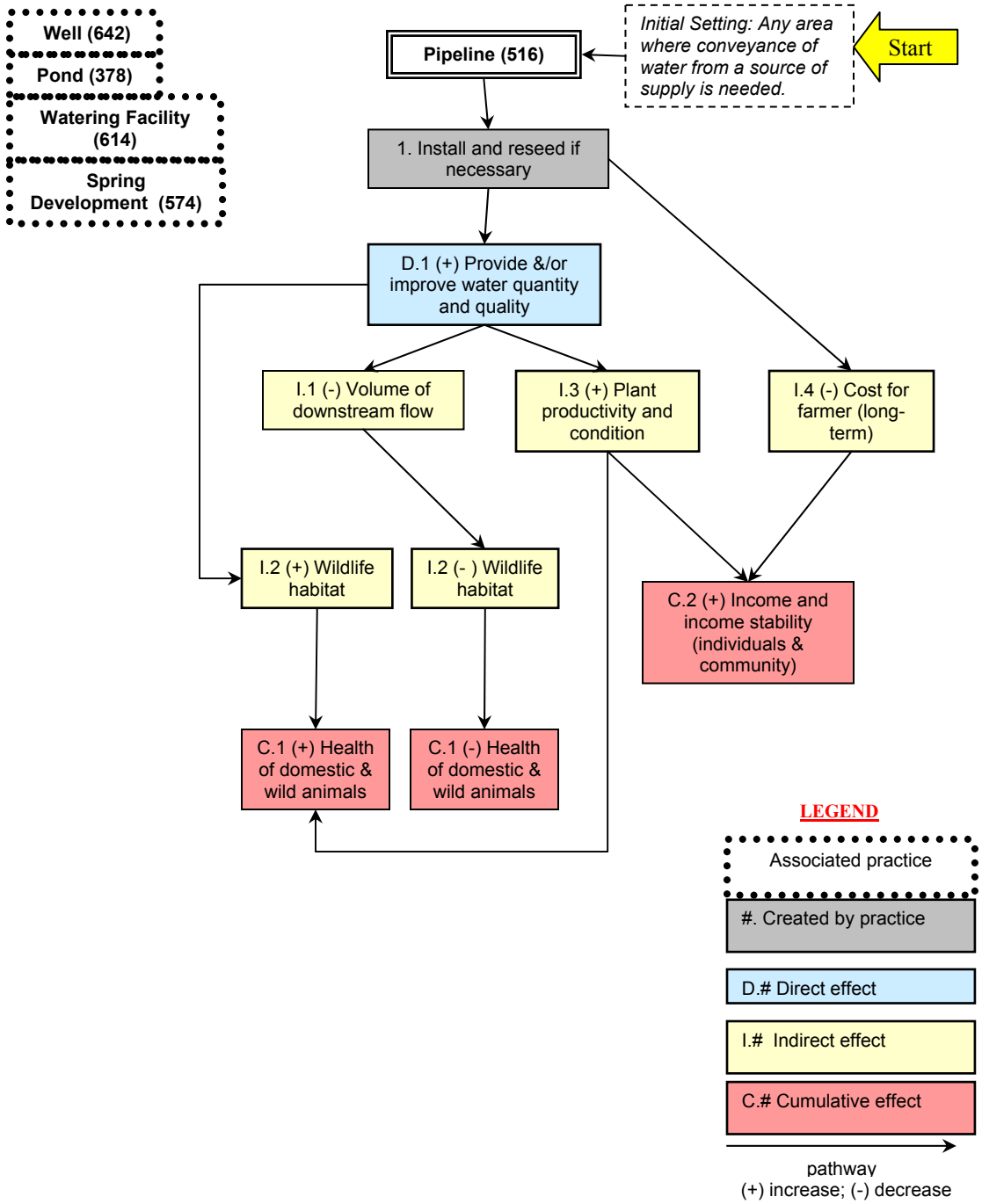
Pipeline Practice

Version 5.29.02



POND

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 378

POND
A pond is a water impoundment made by constructing a dam or by excavating a pit or dugout.

PRACTICE INFORMATION
If a dam is constructed, the pond is referred to as an embankment pond; if the pond storage is achieved solely by excavating material, the pond is referred to as an excavated pond.
The purpose of this type of pond is to provide water for livestock, recreation, and fish and wildlife. Other uses include providing a water supply for things such as fire control and crop or orchard spraying.

The NRCS POND standard applies under the following conditions:
1. If a dam is constructed, failure will not result in loss of life, damage to homes, commercial buildings, main highways, railroads, or interruption of public utilities.
2. The product of the storage (acre feet) times the effective height of the dam is less than 3000.
3. The effective height of the dam is 35 ft. or less.

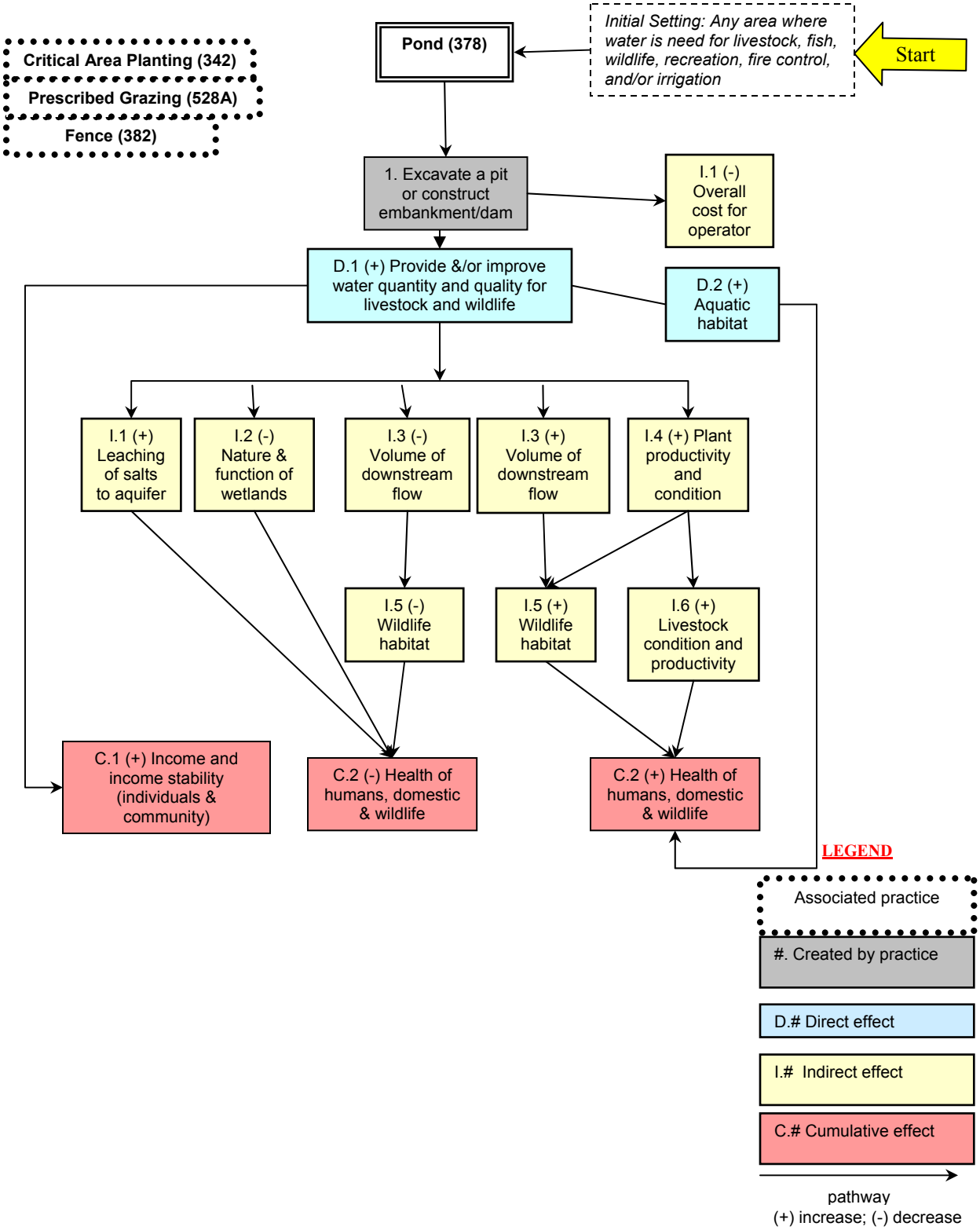
Design and installation of a pond requires the following conditions:
1. The site must be such that runoff from the design storm can pass safely through a natural or constructed spillway. The spillway (s) may be the principal spillway, emergency spillway, or combination of both.
2. The drainage area must be protected from erosion that would significantly reduce the expected life of the structure.
3. The drainage area must be large enough so that surface runoff and groundwater flow will normally maintain an adequate supply of water in the pond.
4. The water quality must be suitable for the intended use of the water.
5. The topography and soil must be suitable for the structure.

Additional information including design criteria and specifications 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.

Pond Practice

Version 5.29.02



RANGE PLANTING

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 550

RANGE PLANTING
Range planting is establishment of adapted perennial vegetation.

PRACTICE INFORMATION
This practice applies to rangeland, native or naturalized pasture, grazed forest or other suitable land areas where the principle method of vegetation management is grazing.

Vegetation types might be grasses, legumes, shrubs, forbs, shrubs and trees.

The practice applies where desirable vegetation is below the acceptable level for natural reseeding to occur, or where the potential for enhancement of the vegetation by grazing management is unsatisfactory.

Species, cultivars or varieties selected must be compatible with management objectives and adapted to climatic conditions, soil, landscape position, and range site. In addition, the selected species for planting must provide adequate cover for erosion control. Plants selected for establishment should also contribute to wildlife and aesthetics when opportunities exist and are in line with planning objectives.

Plant establishment requires the following:
1. Proper seedbed preparation
2. Observe recommended planting dates
3. Plant at the recommended rate or spacing
4. Use quality seed and plant material
5. Apply recommended soil amendments and fertilizer
6. Control weeds and grazing during establishment period

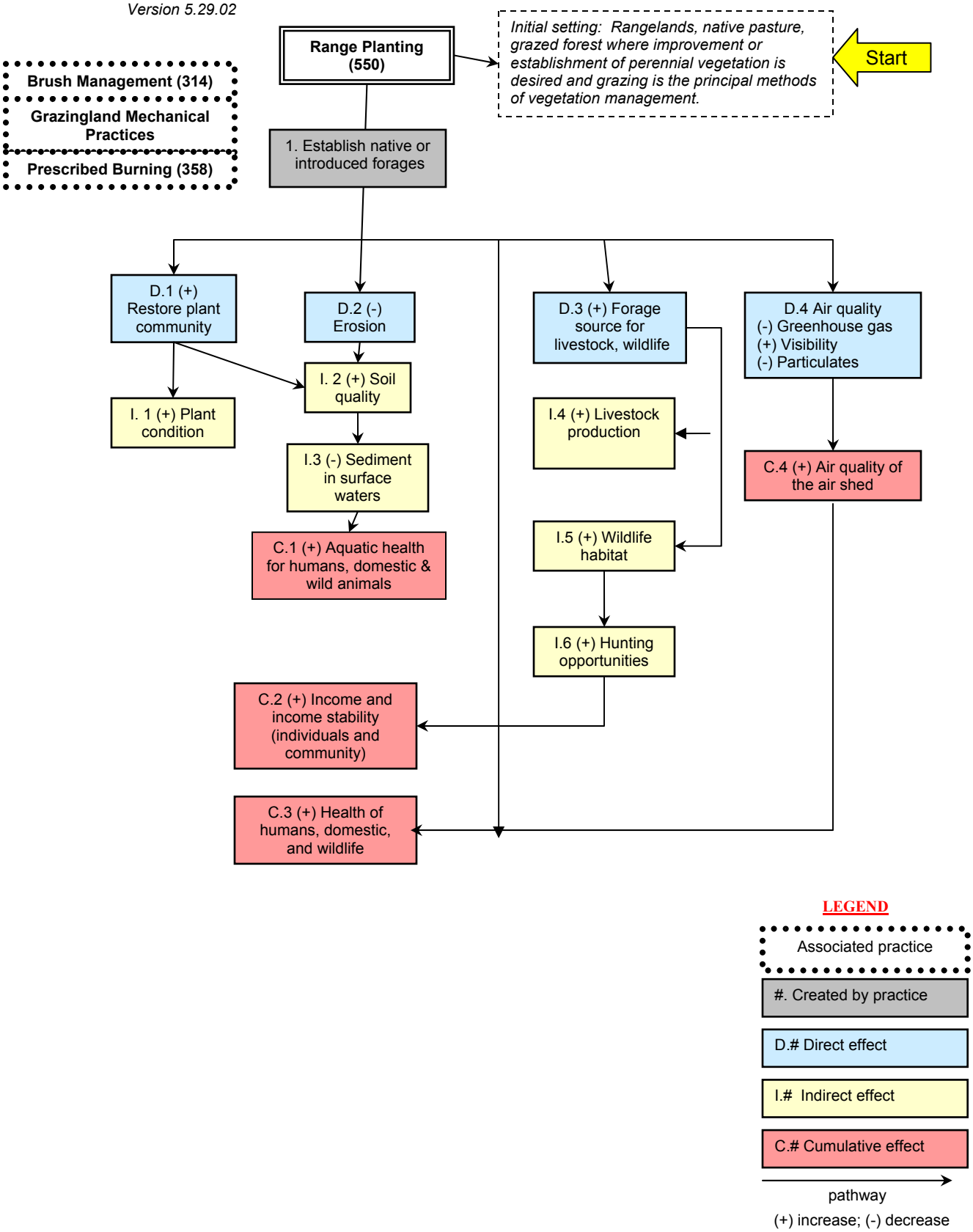
Other conservation practices such as Brush Management, and Grazing Land Mechanical Treatment may be needed to promote establishment and management of a successful range planting.

Additional information including practice specifications can be obtained from your local NRCS field office or USDA service center.

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.

Range Planting Practice

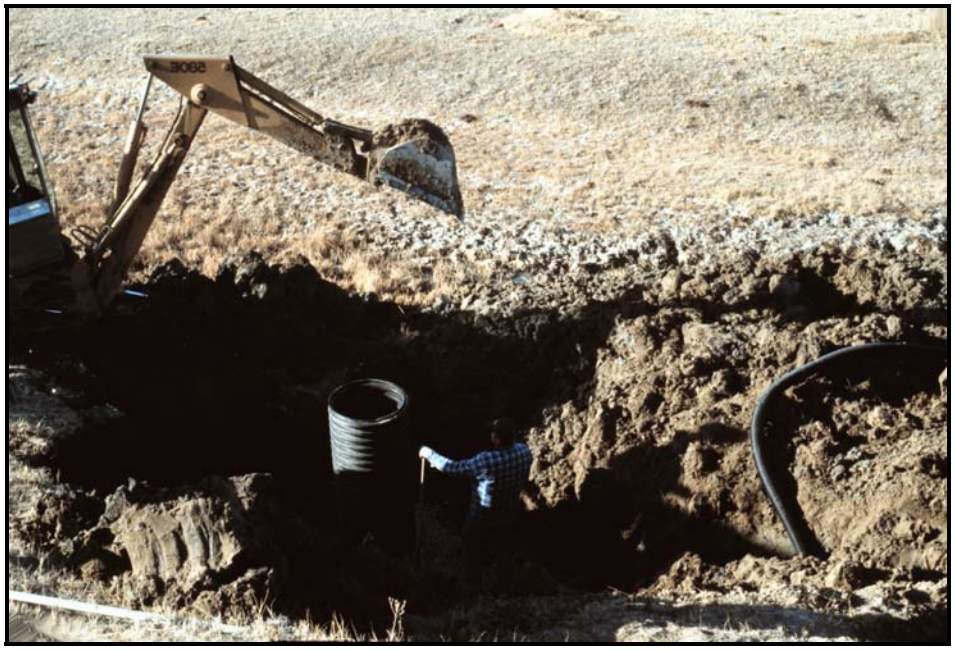
Version 5.29.02



SPRING DEVELOPMENT

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 574



SPRING DEVELOPMENT
Spring Development is improving springs and seeps by excavating, cleaning, capping, or providing collection and storage facilities.

PRACTICE INFORMATION
The purpose of the practice is to improve distribution of water for livestock, recreation and wildlife. The practice also applies to irrigation when the quantity and quality are suitable for irrigating crops.

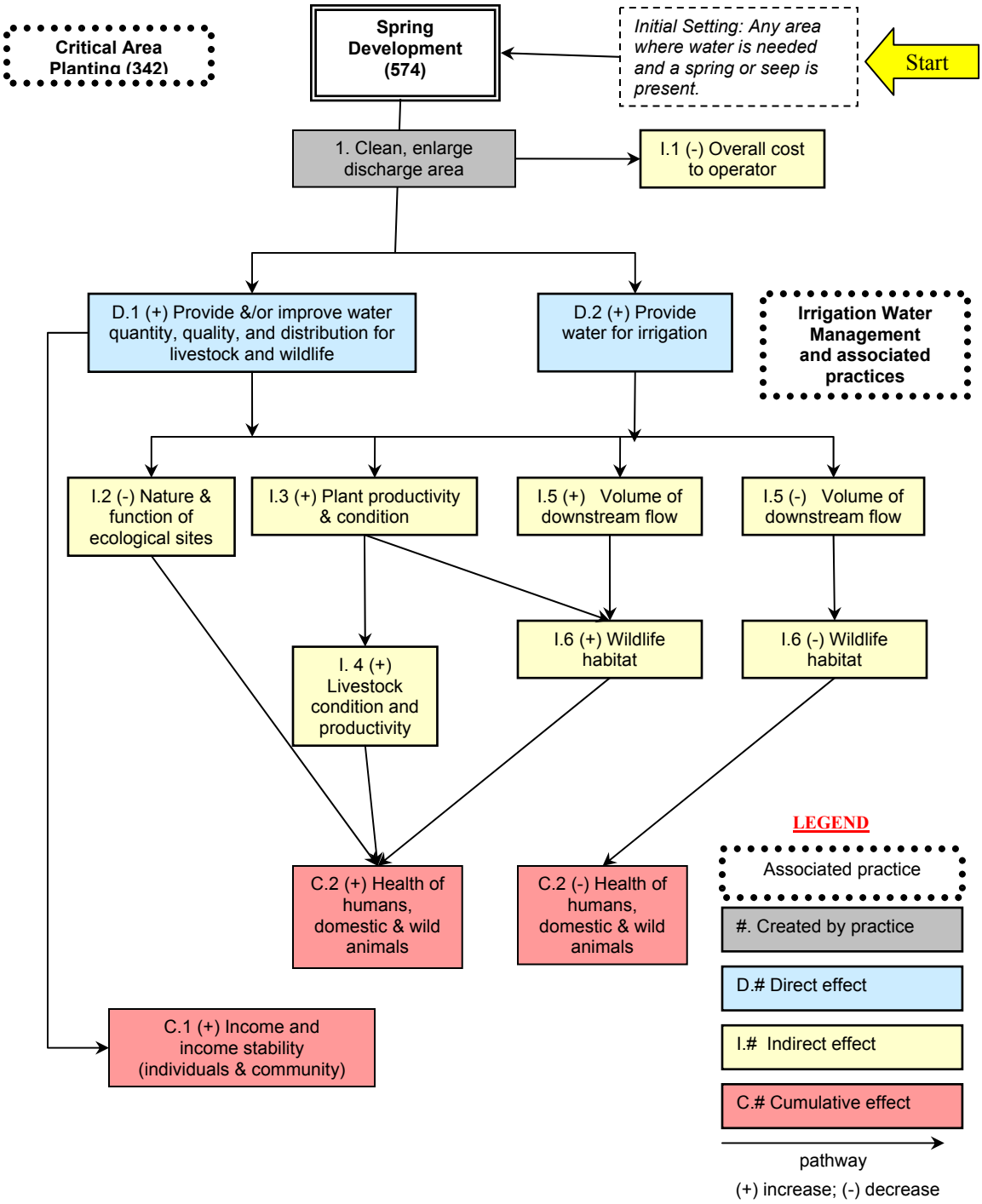
Spring development involves cleaning and/or enlarging the discharge opening of the spring. Other appurtenances might be needed such as a collection device to channel the water, and a spring box to provide a small amount of storage as well as a sediment trap and connection point for an outlet pipe (s). The outlet pipe (s) may then lead to a storage facility (s) such as a trough or tank.

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, soil, etc. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Spring Development Practice

Version 5.29.02



WASTE STORAGE FACILITY

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 313

WASTE STORAGE FACILITY
A waste storage facility is a waste impoundment made by constructing an embankment, excavating a pit or dugout, or by fabricating a structure.

PRACTICE INFORMATION
A waste storage facility is a component of a complete agricultural waste management system. The purpose of the practice is to provide temporary storage of waste material generated by production and/or processing of agricultural products. The waste material may be animal manure, wastewater, or contaminated runoff.

An operation and maintenance plan is developed to specify requirements for emptying the storage facility. The plan specifies timing, rates, and volume of waste applications. For ponds, the plan also includes requirements for timely removal of waste material to accommodate subsequent storms.

Design criteria for this practice includes:

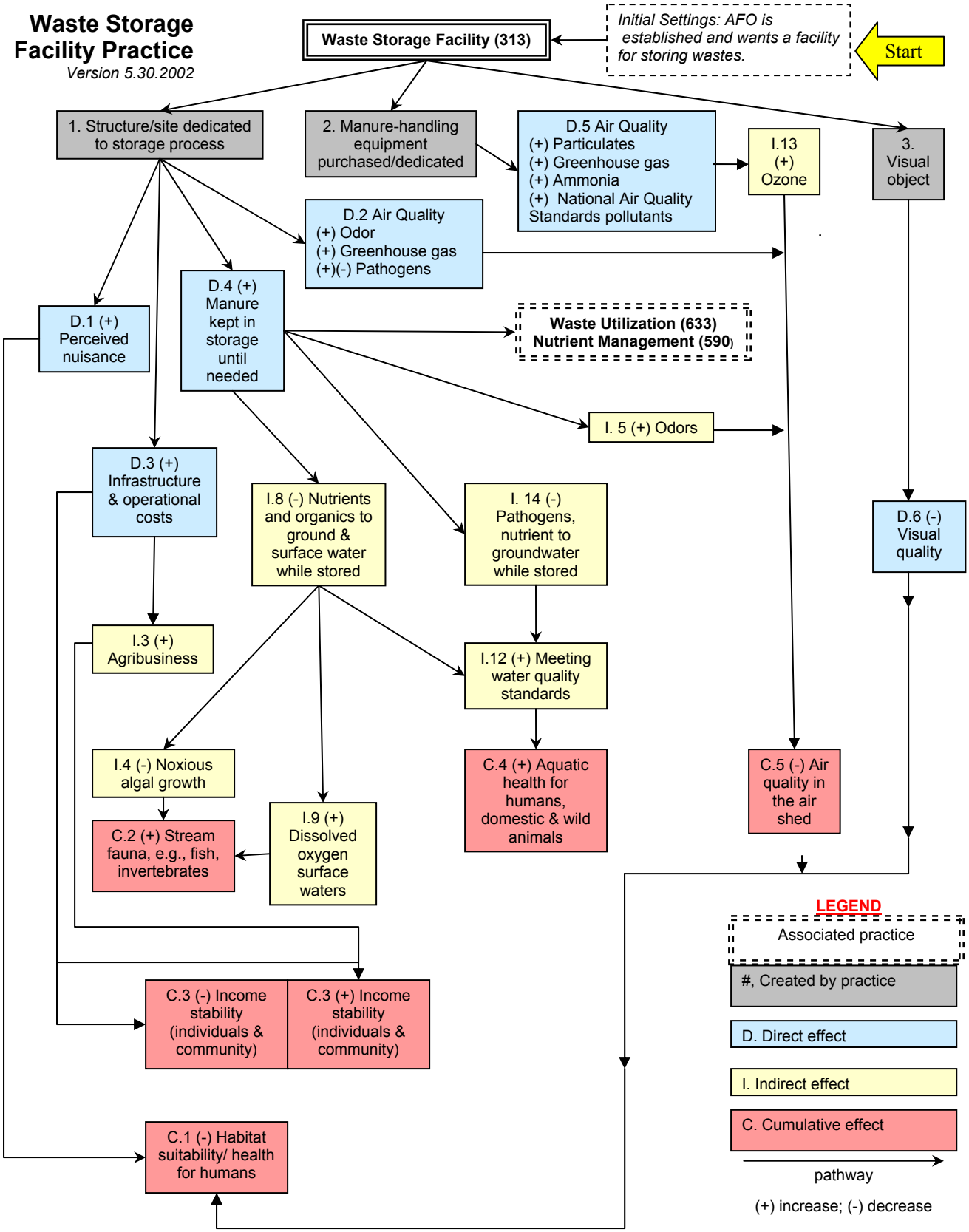
- Site location
- Design storage volume
- Storage period
- Inlet structures
- Safety features
- Pond criteria
- Emptying facilities
- Fabricated structure criteria

Additional information including detailed design criteria and specifications is 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.

Waste Storage Facility Practice

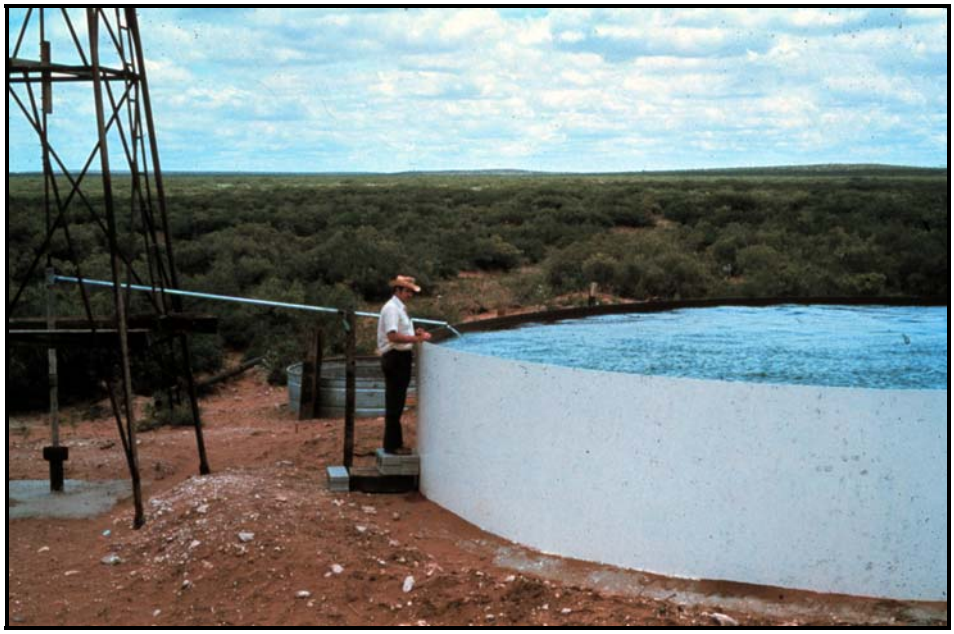
Version 5.30.2002



WATER WELL

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 642



WATER WELL

A Well for conservation purposes is constructed or improved to provide water for irrigation, livestock, wildlife, or recreation.

PRACTICE INFORMATION

The purpose (s) of the practice is to facilitate proper use of vegetation, and provide water for livestock, wildlife, recreation, and crop production.

The practice applies to drilled, driven, and dug vertical or horizontal wells constructed to supply water from an underground source.

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

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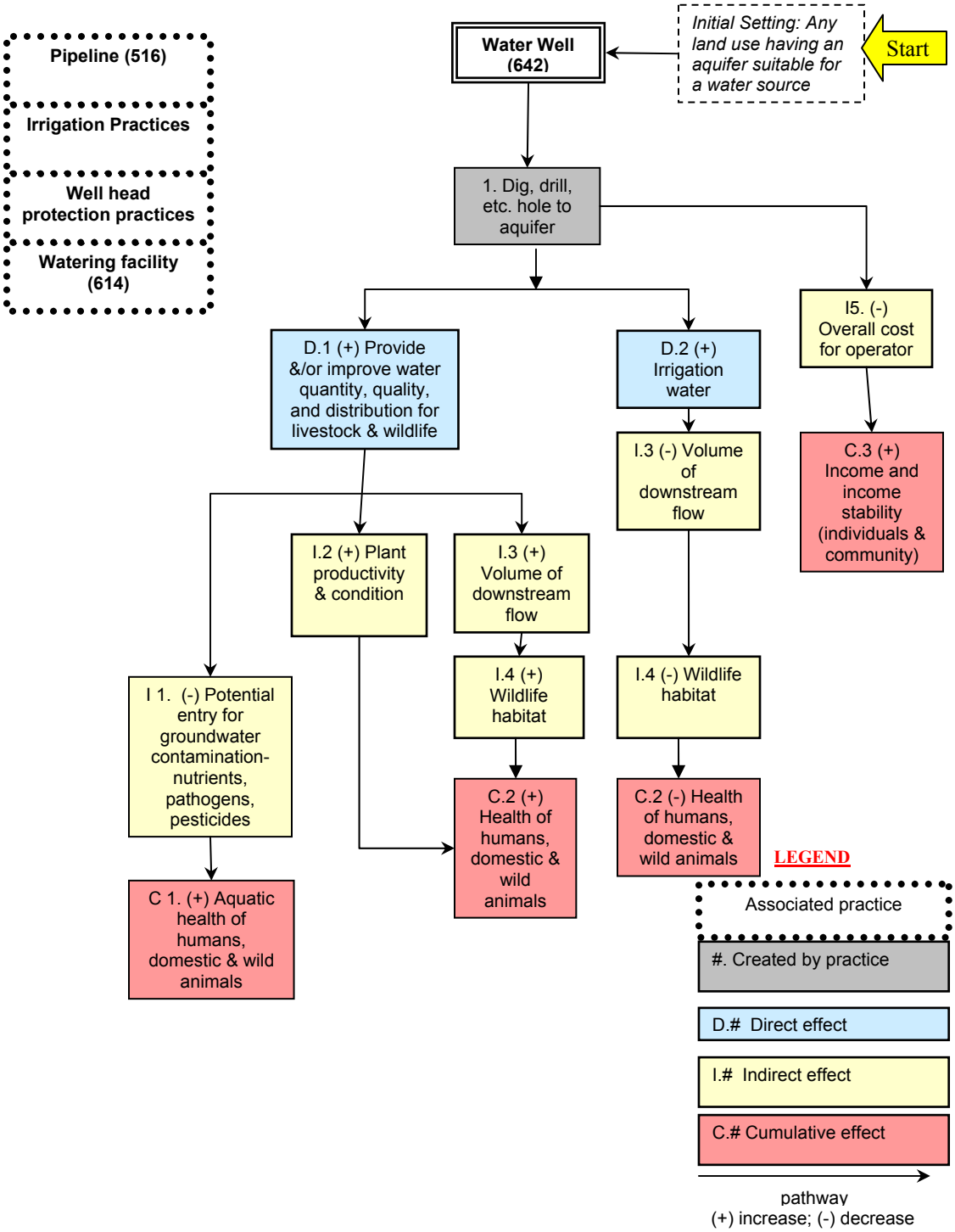
Water Well Practice

Version 5.29.02



WATERING FACILITY (TROUGH OR TANK)

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 614

WATERING FACILITY
A trough or tank is installed as a livestock watering facility.

PRACTICE INFORMATION
A watering trough or tank provides livestock with drinking water at planned locations that will protect vegetative cover through proper distribution of grazing or other management techniques. The water source (s) may be a well, spring, stream, pond or other sources including water hauling in some situations.

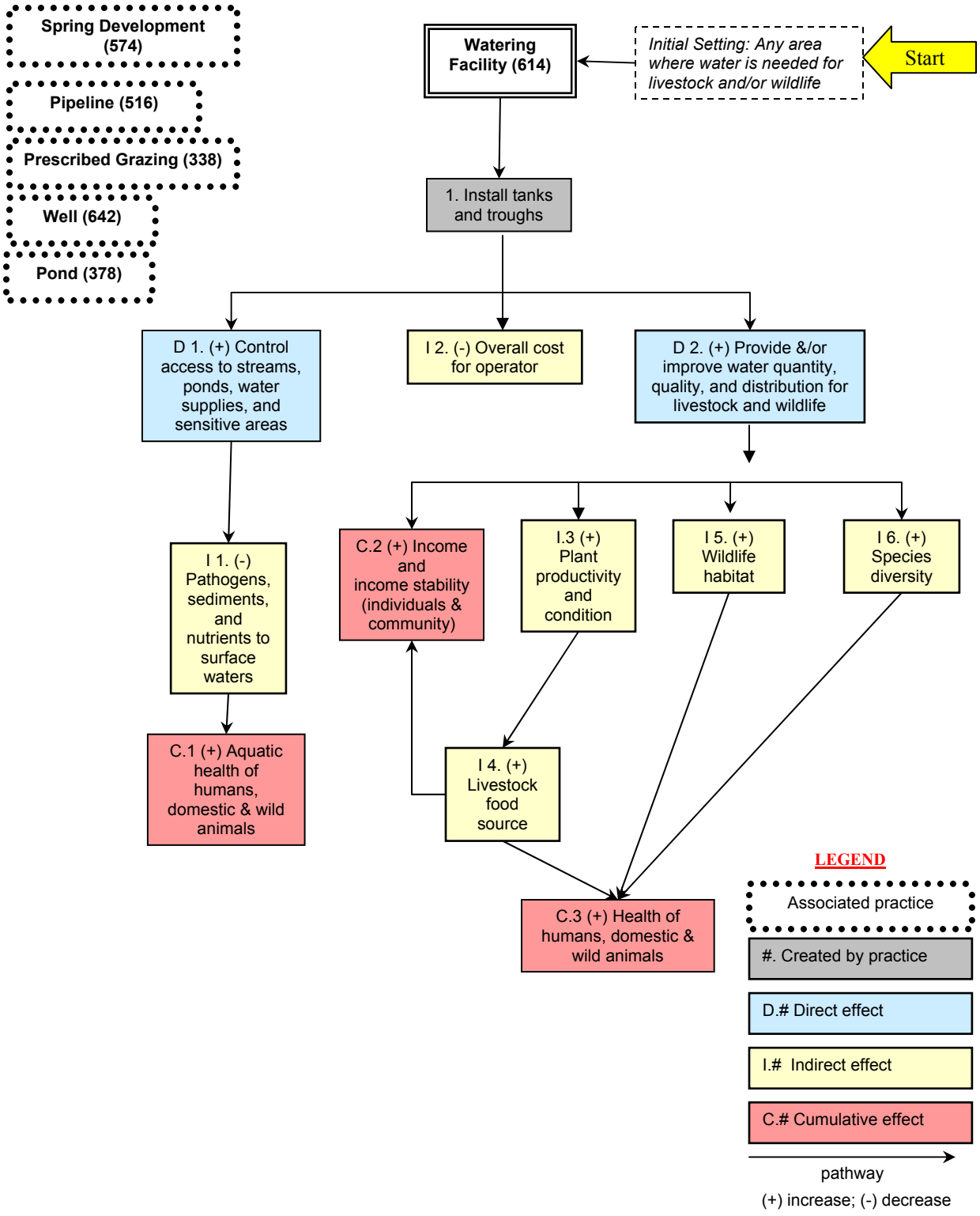
In addition to providing livestock water, troughs are sometimes installed to keep cattle out of streams and other surface water areas where water quality is a concern.

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, soil, etc. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Watering Facility Practice

Version 5.29.02



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.

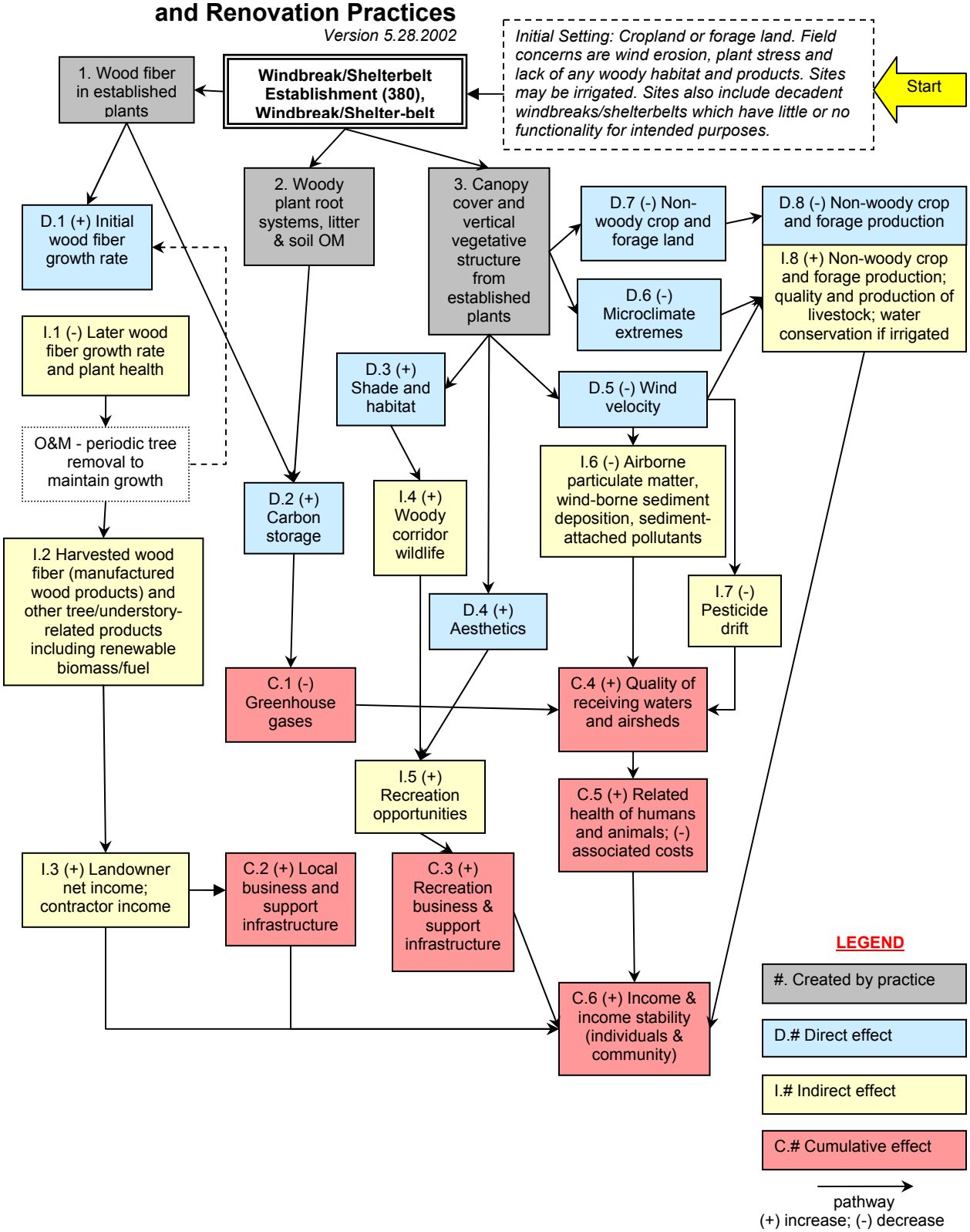
The effectiveness of a windbreak or shelterbelt is dependent on the height of the mature plants. Therefore, this is a long term proposition that may take 20 years to become fully functional.

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 Establishment and Renovation Practices

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