

## THE CHALLENGE

Colorado is in the grip of a multi-year drought—one of the worst on record. It has had severe effects on agriculture, tourism, recreation, commerce, municipal water supplies, and wildlife. This is in addition to the devastating effects of numerous wildfires upon watersheds and communities across Colorado's landscapes. The total impact to the state's economy has yet to be determined, and the estimates continue to escalate.

The National Oceanic and Atmospheric Administration (NOAA) monitors drought conditions across the United States. As of April 29, 75% of the state is considered to be in "extreme" drought, with the remaining portion rated "severe" or "moderate" (*Exhibit 1*). This is worse than last year's April 30 report, when one-half of Colorado was classified as being in an "extreme" drought, with the other half rated "severe" (*Exhibit 2*). Although much of the state has experienced some well-publicized, high moisture snow this spring, snowpack remains below normal over much of the state (*Exhibit 3*). As of May 1, Colorado snowpack is 87% of average, with the southwestern one-third of Colorado's Rocky Mountains registering less than 90% of average. This is on top of last year's even more dismal report, when the majority of the basins were considered "exceptionally below average," or at less than 25% of average snowpack (*Exhibit 4*). On a statewide basis, snowpack has been below normal each year since 1997. Significant water deficits remain in soils, woody vegetation, aquifers, and surface reservoir storage (*Exhibit 5*). As of May 1, reservoir storage is only 60% of average.

Streamflow forecasts mirror the bleak reservoir storage reports (*Exhibit 6*). Most streams are forecast to carry significantly less water than normal. One-half of the mountains will support less than 70% of average streamflow, with some less than 50%. Last year's report forecast most areas to be well below 50% of average, or "extremely to exceptionally below average" (*Exhibit 7*).

NOAA's Paleoclimatology Program has been analyzing tree rings to reconstruct past hydroclimatic conditions. The tree ring reconstructions of streamflow provide insight into a 300-500 year period. Analyses of data for the Upper Colorado and South Platte River watersheds suggest that the severity of the current drought (through 2002) has been matched or exceeded about five times in the past three centuries. When one considers the relative impacts of this drought on communities, commerce, and natural resources, it is arguably at or near the top of the list.

Lessons learned from the 1930s reduced the severity of impacts of the 1950s drought. Conservation measures promoted by the Soil Conservation Service (now the NRCS) and local conservation districts moderated the effects of that drought period, even though the climatological conditions were similar to those of the Dust Bowl period. The severe impacts of drought on natural resources, communities, and economies can be mitigated through sound resource conservation planning, including drought mitigation planning. The NRCS administers a number of programs that can be directed or redirected to help mitigate the impacts of drought on our landscapes and economies. Action must be taken now to ensure protection and recovery of our soil, water, air, plant, and animal resources.

## RESOURCE IMPACTS

- The drought is having major impact on the agricultural economy of the state. Rangelands are deteriorating, plants are dying, and soils are exposed to erosion and weed invasion. Irrigated and dry croplands both saw production losses last year. In some cases no attempt was made to harvest due to failed crops.
- Ranchers are culling their herds, little by little, in an attempt to hang on until the drought eases. Most ranchers have to feed, rather than pasture, their herds during the winter months. Because the majority of the hay produced for winter feed comes from irrigated lands, the drought has limited winter feed production as well.
- Much of the state depends on stream flows for irrigation water. **Exhibit 6** represents expected stream flows as of May 1. A quick review of this map reveals that most basins will support less than normal streamflow. One-half of the mountains will support less than 70% of average streamflow, with some less than 50%. This equates to another short water year for irrigated cropland, including irrigated hayland.
- Not all irrigation water comes directly from streams. Some comes from reservoirs, routed through systems of irrigation canals and ditches. Some is pumped from ground water aquifers. **Exhibit 5**, prepared by the NRCS's National Water and Climate Center in Portland, Oregon, depicts the status of reservoir storage in the western United States. Reservoir storage in Colorado is only 60% of average. This means that there will be little reservoir water to offset shortages in natural stream flows.
- Those irrigators using wells have seen their aquifers depleted due to drought conditions. The Plains Ground Water Management District, which pumps its water from the Ogallala Aquifer in Colorado, saw water levels depleted by as much as three feet during the past year of drought. This has cost agricultural producers significant amounts of money. Wells had to be deepened, increasing operating costs. Deeper wells required the use of more energy to lift the water, which added more operating expenses.
- There are approximately 7 million acres of dry cropland in the state. None of these acres have been spared from the effects of this statewide drought, although the current outlook for the winter wheat harvest is cautiously optimistic. Without continued moisture, however, subsoil moisture levels will not be replenished and the risk of crop failure remains.
- 2002 saw the lowest winter wheat production since 1967—down 45% from 2001. Nearly 700,000 acres (almost one-third of all planted acres) were abandoned.
- Similarly, many acres of dryland corn planted for grain were abandoned or harvested for silage or hay. Water shortages limited yields on irrigated acres. Total acres harvested for grain was the lowest number since 1986.

## SUMMARY OF IMPACTS ON NATURAL RESOURCES

### Soil

- ⊕ Erosion: Accelerated erosion by wind and water (sheet, erosion).
  - *Wind erosion abrades living plants, resulting in plant damage and mortality, and in further exposure of soil.*
- ⊕ Diminished soil condition: as topsoil erodes, organic matter is lost; soil structure deteriorates, affecting its ability to support plant life.

### Water

- ⊕ Quantity: Insufficient water to support plant growth and livestock needs.
- ⊕ Quality: Sediment introduced into drainageways, canals, and other water bodies; salt accumulation; pollutants are concentrated in smaller volumes of water.



### Air

- ⊕ Quality: Dust blowing impacts health of humans and domestic livestock; wind-borne sediment abrades plants, as well as human structures; visual quality is impaired.

### Plants

- ⊕ Cultivated: Plant mortality; suppressed yields; reduced plant vigor; vulnerability to disease and insects.
- ⊕ Native communities: Plant mortality; suppressed yields; reduced plant vigor; vulnerability to disease and insects; loss of basal cover; loss of species; weed invasion.
- ⊕ Forest Health: Tree mortality; reduced plant vigor; vulnerability to disease and insects; increased fuel loading (wildfire risk); weed invasion.

### Animals

- ⊕ Domestic: Inadequate food and water.
- ⊕ Wildlife: Aquatic species at risk; upland species lack food, water, cover in localized areas.

## RESOURCE CONDITION ASSESSMENT

A rapid resource assessment was conducted to estimate the current condition of natural resources. Field and Area Office staffs were consulted, and combined with information from other conservation partners and organizations, an overall estimate of

drought impacts on major land uses emerged. The information was collected on a “watershed association” basis. These are assemblages of conservation districts that loosely approximate the boundaries of the ten major hydrologic basins in the state (*Exhibit 8*).

### ***Total Grassland Resource***

There are about 25.2 million acres, overall, of privately owned grasslands in Colorado. Nearly 15 million acres (59%) are classified as critically or significantly impacted by drought.

### ***Rangeland***

We have characterized the effect of the drought on rangeland by evaluating the condition of plant communities' basal ground cover. A "critical" impact means a plant community has lost more than 40% of its basal cover. A "significant" impact means a plant community has lost between 20% and 40% of its basal cover. Loss of basal cover not only reflects loss of forage production, but also increased exposure of soils to erosion and weed invasion.

There are 24 million acres of privately owned rangeland in Colorado. The rangeland assessment indicates that 14.5 million acres (60%) of the state's rangeland is either critically or significantly impacted by the drought. These lands will not recover rapidly in the arid moisture regime of the West. A more complete view of the impacted acres is provided in Table 1, *Exhibit 9*.

### ***Pastureland***

There are nearly 1.2 million acres of privately owned pastureland in Colorado.

In terms of plant community health, introduced pasture grasses are faring better than native grasses in our rangelands due only to the fact that about 43% of them normally are under irrigation. We estimate that 444,000 acres are critically or significantly impacted by the drought. This acreage amounts to 38% of all Pasturelands (irrigated and non-irrigated) and 66% of non-irrigated Pasturelands. These pastures generally are located on some of the better soils associated with the operating unit. An in-depth view of the pasture condition can be obtained by reviewing Table 2, *Exhibit 9*.

Overall, nearly 15 million acres (59%) of the total grassland resource are classified as critically or significantly impacted by drought. The impacts on a watershed association scale can be seen in Table 3, *Exhibit 9*.

### ***Irrigated Cropland***

There are approximately 3.8 million acres of irrigated cropland in Colorado. Only the "critical" level of drought impact has been considered for irrigated cropland. This refers to land that: 1) will not have irrigation water, and 2) has no vegetative cover. Only 6% of Colorado's irrigated croplands are currently estimated to be in this condition (*Exhibit 10*), although the Rio Grande, Lower Arkansas, and Gunnison-Dolores Basins are in worse condition, with 15%, 11%, and 10%, respectively, rated as "critical." It appears producers expect to have enough early season moisture to be able to at least plant a small grain. This will yield both a marketable crop and protective residue.

### ***Non-irrigated (Dry) Cropland***

There are approximately 7.38 million acres of dry cropland in Colorado. The major dry land crops grown are wheat, corn, alfalfa, and beans. Fragile soils, highly susceptible to wind erosion, dominate these acres.

Only the "critical" level of drought impact has been considered for non-irrigated cropland. "critical." This is land that has, or is expected to have, no vegetative cover this year. Statewide, only 10% of non-irrigated croplands are currently estimated to be in this condition (*Exhibit 10*). The Gunnison-Dolores and North Platte-White-Yampa Basins are in worse condition, with 39% and 19%, respectively, rated as "critical." It appears producers expect that recent precipitation may be enough to sustain the winter wheat crop and leave enough residue to protect the soil through the next fallow period. This optimism may or may not prove justifiable. Most fields last year yielded stunted plants, many of which were not harvested.

### ***Forestland***

Colorado's forests have suffered under deficit moisture conditions for a number of years. Wildfires have destroyed forest and ground cover in numerous watersheds. Tree and shrub planting is needed to reduce help restore the hydrological condition and to reduce flood hazards. Three forest types—Ponderosa Pine, Lodgepole Pine, and Pinyon-Juniper—constitute 1.2 M acres of the 3.4 M acres of privately owned forestland in the state. Fully one-half of these forests are considered "critically stressed by drought" and are in need of treatment. *Figure 11* depicts the location of these areas by forest type and watershed.

### ***Urban Land***

Low reservoir storage means less water for communities. Most municipal water suppliers have invoked strict conservation limits on landscape irrigation, which accounts for one-half of all urban water use. New homes can't install landscapes/lawns until water supplies improve. Post-construction soils seldom are improved, which undermines landscape and water management even in good years. In drought, healthy soil can make the difference between landscape survival and mortality. Healthy urban landscapes are not simply for

aesthetics. They function as environmental filters for air and water resources. Drought-impacted landscapes will result in diminished air and water quality.

## STRATEGIES AND ACTIONS

Our strategy relies on focusing limited technical and financial assistance to those areas or situations that will yield the greatest marginal benefits. Our priorities are:

1. *Reduce the impact of the current drought.*
2. *Accelerate recovery of our natural resources.*
3. *Prevent avoidable impacts from future droughts.*

We will provide assistance on private and Tribal lands, making technical assistance and information widely available. Financial assistance will be used selectively, on a limited and priority basis. Screening tools and scoring systems will be developed for each watershed that will identify those projects that can produce the greatest conservation benefits—protecting and/or improving what remains. We will also increase drought disaster preparedness from both landowner and resource perspectives.

### 1. *Range/Pasture Strategies*

**Goal:** Protect grassland resources from further degradation and enhance recovery.

**Actions:**

- Assist livestock producers in the development of grazing management plans through accelerated technical assistance that will enhance the grazing land's ability to recover from current drought conditions.
- Accelerate the implementation of conservation practices that will facilitate grazing land management, including infrastructure development (livestock water systems, fencing) and management practices that will protect the resource from further degradation and enhance recovery (deferment, prescribed grazing management).
- Provide targeted financial assistance to critically or significantly affected areas.
- Re-seed damaged land where appropriate.
- Help producers to enhance wildlife habitat.
- Assist producers to implement *Rapid Resource Assessment* techniques that they can employ on their own to improve grassland resource monitoring and restocking strategies.

- Implement a combination of conservation treatments appropriate to the level of drought impact:

***Critical:***

1. Livestock deferment for one to two growing seasons during the drought period. Rotational grazing once drought breaks normally during the second and third growing season. Winter allocation of forage based on excess amount needed to protect against soil erosion. Livestock grazing schedule will be based on a recovery period of three to five years.
2. Approximately .05% of acres will require seeding.
3. Pasture partitioning to allow for rotational grazing of at least four pastures. The minimum rotation will be: graze no more than 30 days followed by 75 days of rest. NRCS will work with producers to adjust grazing and rest schedules as conditions change.
4. Well/stock tank development will be implemented to establish or improve reliable water for livestock.
5. Brush management will permit a build up of plant vigor in the understory. The shallow-rooted grasses, forbs, and shrubs will have a greater detriment to continue versus the deeper-rooted shrubs that survived the drought and will receive more nutrients and reseed more vigorously.

***Significant:***

1. Livestock deferment of one growing season during the drought period. Additional management per critical No. 1 (above). Livestock grazing schedule will be based on a recovery of three years.
2. No seeding required.
3. Pasture partitioning will be implemented to facilitate improved grazing schemes.
4. Well development, same as for critical impact strategy.
5. Brush management.

***Limited:***

1. Livestock grazing will be a rotational grazing during the growing season seasonal rotation may be necessary associated to cool or warm season grasses but not for the entire growing season. Livestock grazing schedule adjustments will be based on a recovery period of two years.
2. No seeding required.
3. No fencing required.
4. No well development.
5. No brush management.

***Negligible:***

1. Livestock grazing will be a rotational grazing during the growing season. Livestock grazing schedule adjustments will be based on a recovery period of one year.
2. No seeding required.
3. No fencing required.
4. No well development.

**2. *Irrigated Cropland Strategies***

**Goal:** Protect the soil resource and maximize the beneficial use of irrigation water.

**Actions:**

- Provide increased technical assistance. (No targeted financial assistance for drought is anticipated.)
- Promote irrigation water management techniques.
- Encourage crop residue management.
- Promote use of cropping sequences that conserve soil and promote soil health.
- Encourage the use of crops that demand less water.
- Support planting temporary cover crops (e.g. small grains) that may provide temporary livestock foraging opportunities, in addition to soil protection--especially in temporarily de-watered areas.

**3. *Non-irrigated (Dry) Cropland Strategies***

**Goal:** Protect and improve the soil resource.

**Actions:**

- Provide increased technical assistance (No targeted financial assistance for drought is anticipated.)
- Encourage protection of existing crop residue.
- Promote conservation tillage, including no-till, for erosion control and soil health.
- Encourage terracing for soil and water conservation.

**4. *Forestland Strategies***

**Goal:** Protect our forest resources.

**Actions:**

- Provide increased technical assistance.
- Promote forest stand improvement, with slash removal for fuels reduction and insect control.

- Install fire breaks.
- Implement pest management for insect and weed control.
- Promote tree/shrub establishment for reforestation.
- Encourage prescribed burning for fuels reduction in partnership with the Colorado State Forest Service.

## 5. *Urban Land Strategies*

**Goal:** Promote resource stewardship in urban and developing areas.

**Actions:**

- Provide increased technical assistance to units of government to ensure that local regulations and ordinances are science-based and do not lead to unintended consequences.
- Support the work of the Colorado WaterWise Council and Xeriscape Colorado!, Inc.
- Promote best management practices for urban lands.

## **WATER MANAGEMENT TOOLS**

We propose to implement a series of water management tools to help mitigate drought impacts on the state's water users. We will improve the ability to monitor and manage existing water supplies. The foundation for many of these tools lies in improving our ability to monitor conditions within the hydrologic cycle. Equipped with a better understanding of the water balance, developing new and improved tools for water management and drought preparedness can be achieved.

The NRCS Snow Survey and Water Supply Forecasting Program is uniquely equipped to develop these new and improved water management tools. The data collected through the SNOTEL/SCAN networks has become an integral component in managing the existing drought. Expanding these networks to further advance our ability to monitor and manage water supplies will provide invaluable tools, not only for the existing drought, but also for future droughts.

*Exhibit 12* outlines the identified water management needs, actions required, and associated costs.

## **PUBLIC INFORMATION CAMPAIGN**

An aggressive information and education action plan (*Exhibit 13*) will be implemented to ensure landowners are aware of the programs and technical assistance available to them through NRCS, the 77 conservation districts, and other partners.

## BUDGET ISSUES

### Programs

#### Conservation Treatment Requests (Drought Related)

Applications received for 2003 EQIP funding convey the widespread need for conservation treatment and financial assistance. A total of 2,958 applications requested over \$80 M for all assistance available through EQIP. **Drought-related** applications included the following:

<u>EQIP Issue</u>	<u>Requests (\$)</u>	<u>Acres</u>
Water Quality/Quantity	\$32,150,290	162,975
Soil Erosion	\$ 3,574,975	81,538
Grazing Lands	\$13,399,203	1,177,925
Ground/Surface Water Conservation	\$13,437,312	121,558
<b>Totals:</b>	<b>\$62,561,780</b>	<b>1,543,996</b>

#### Total Conservation Treatment Needs

Estimated financial cost to drought-impacted resources statewide.

<u>Land Use</u>	<u>Critical Acres</u>	<u>Avg. Treatment Cost/Acre</u>	<u>Total Cost</u>
Range/Pasture	14,949,000	\$ 7.50	\$112,117,500
Irrigated Cropland	227,498	\$275.00	\$ 62,561,950
Dry Cropland	741,874	\$ 60.00	\$ 44,512,440
Forestland	1,196,934	\$300.00	\$359,080,200
Grand Total:	17,115,306	--	\$578,272,090

#### If no additional funding is available from NHO:

If no additional funding is made available, we will target our limited financial resources to address the most urgent problems that provide the greatest benefits. Up to 15% of EQIP funds could be redirected to fund drought assistance. Funds will be limited; therefore, ranking criteria must reflect the needs of the most critical acres or impacted areas. Financial assistance would be utilized to improve infrastructure--dependable water sources for livestock and fencing--to facilitate improved and more realistic grazing management systems. A total contract dollar cap of \$5,000 to \$10,000 should be imposed. Cost share will not exceed \$7.50 per acre. \$2,000,000 will treat 267,000 acres. This level of funding will allow us to treat only the tip of the iceberg, so strategic implementation will be necessary if we are to help avert continued resource degradation.

Another possibility might be to provide an incentive payment for upland wildlife habitat management on native rangelands in need of deferment. We could also consider supporting the development of water supply for "at risk" and T&E species. We will ensure there is consensus among our partners before pursuing this.

When available, the Conservation Security Program and the Grasslands Reserve Program may also support the objectives of this initiative.

**If additional funding is available from NHQ:**

With additional funding, we could have a much more significant impact on resource protection and recovery. Ten to fifteen percent of EQIP funds would be redirected to drought assistance, matching the amount received from NHQ. The elements of the "no additional funding" scenario would be implemented, with the possibility of raising contract and per acre caps and treating additional acres.

**Technical Assistance**

Additional technical assistance will be required to address the additional workload presented by the drought. Personnel shortages have been identified and are listed in *Exhibit 14*. These include range conservationists, irrigation water management specialists, public affairs specialists, a hydrologist, a hydrology technician, civil engineering technicians, and foresters. Foresters would be Colorado State Forest Service hires, on which we would share the cost.

The total demand would have a three-year financial obligation of \$7,459,260.

## **ACCOMPLISHMENTS**

To date, Colorado NRCS has redirected \$3.68 M to drought-stressed rangeland assistance through the EQIP program. An additional \$4.58 M has been committed to drought-related resource issues through our regular EQIP Program and the Ground and Surface Water Conservation Program. We have established a drought page on our website ([www.co.nrcs.usda.gov](http://www.co.nrcs.usda.gov)) that highlights activities underway and directs clients to additional sites, some of which provide soil moisture information, fire danger status, defensible space information available through Colorado State Forest Service, and fact sheets and design information on water conservation best management practices, including Xeriscape. We have also utilized hundreds of volunteers in work related to post-wildfire watershed protection efforts.

**Information and Education Accomplishments Related to Drought**

1. Conservation districts, USDA Natural Resources Conservation Service, and other organizations and agencies have sponsored several rangeland drought workshops around Colorado. The following is a listing of where some of the workshops have been held:

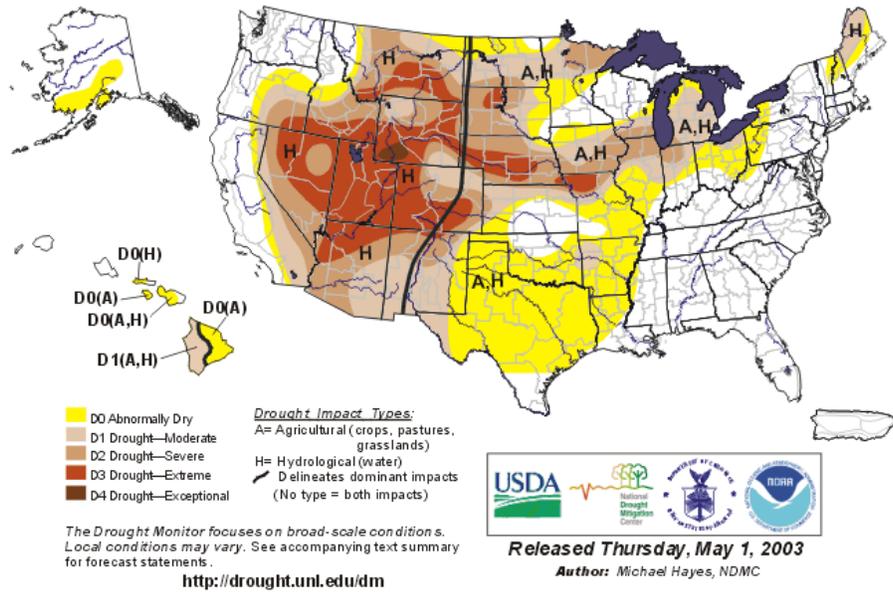
<b>Siebert</b>	<b>Rocky Ford</b>	<b>Springfield</b>
<b>Wray</b>	<b>La Junta</b>	<b>Cortez</b>
<b>Alamosa</b>	<b>Delta</b>	<b>Grand Junction</b>
<b>Salida</b>	<b>Walden</b>	<b>Gunnison</b>
<b>Glenwood Springs</b>	<b>Craig</b>	

2. Developed three Grazing Lands Conservation Initiative Technical Notes for ranchers—restocking strategies, prescribed grazing, and monitoring.
3. Developed an insert titled “Weathering Tough Times” that outlines Colorado’s drought history, gives some background about droughts in general, and lists drought- and conservation-related resources from Federal and state agencies.
4. Colorado Association of Conservation Districts and NRCS sponsored a drought tour in August 2002. Attending were Federal and state legislators and staff, representatives from other agricultural organizations, and regional, state, and local media, including all three major network TV stations in Colorado Springs.
5. Numerous news releases developed and distributed regarding NRCS assistance available to help mitigate the effects of drought were sent out in 2002.
6. NRCS continues to distribute water supply and snow pack news releases.
7. Continue to document resource conditions with photographic monitoring.
8. Two presentations have been given to organizations regarding the action NRCS in Colorado has done with EQIP dollars to help ranchers and farmers protect the most critically drought-impacted land and resources.
9. The Painted Sky RC&D has helped to distribute information regarding drought and wildfires. It has worked with the American Red Cross to give presentations on defensible space around homes, fireproof materials, and evacuation procedures.
10. Many NRCS offices have worked with their local FSA offices on articles regarding Emergency Conservation Program (ECP) practices for which producers can get cost-share dollars to help them during the drought.
11. NRCS range conservationists have been detailed to critically impacted areas to work one-on-one with producers who are participating in the Drought EQIP Program.



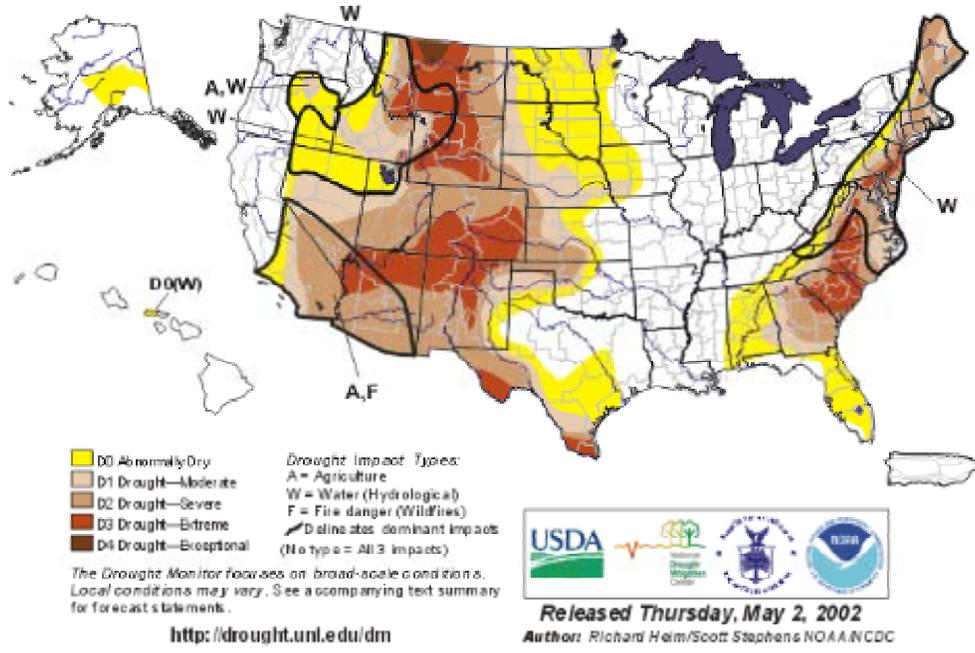
# Exhibit 1

## U.S. Drought Monitor April 29, 2003 Valid 8 a.m. EDT

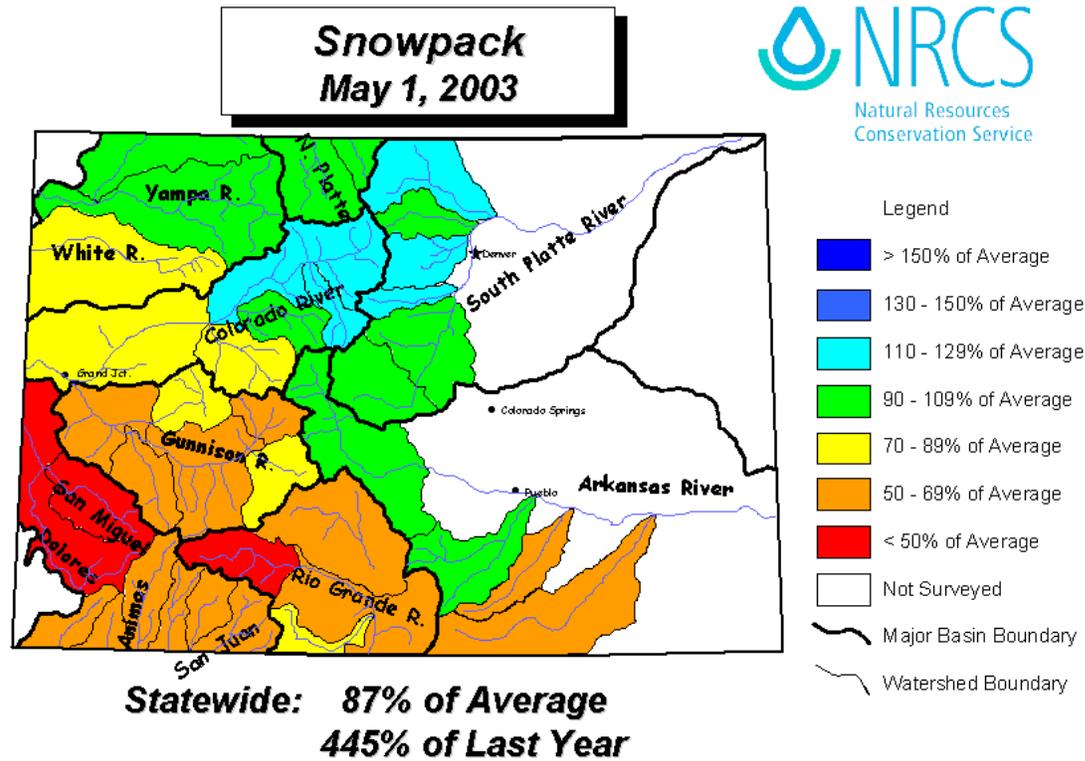


# Exhibit 2

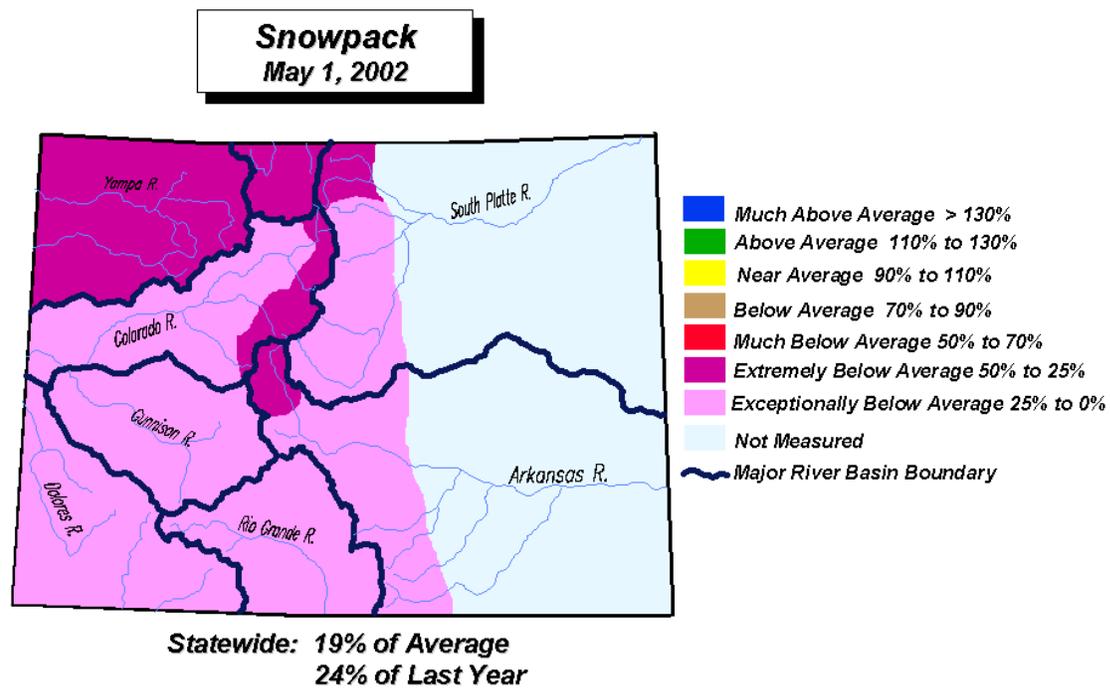
## U.S. Drought Monitor April 30, 2002 Valid 8 a.m. EDT



### Exhibit 3

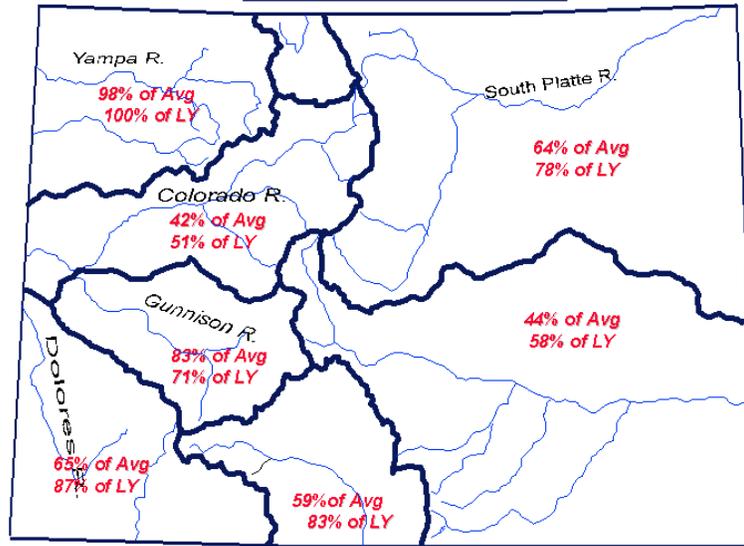


### Exhibit 4



## Exhibit 5

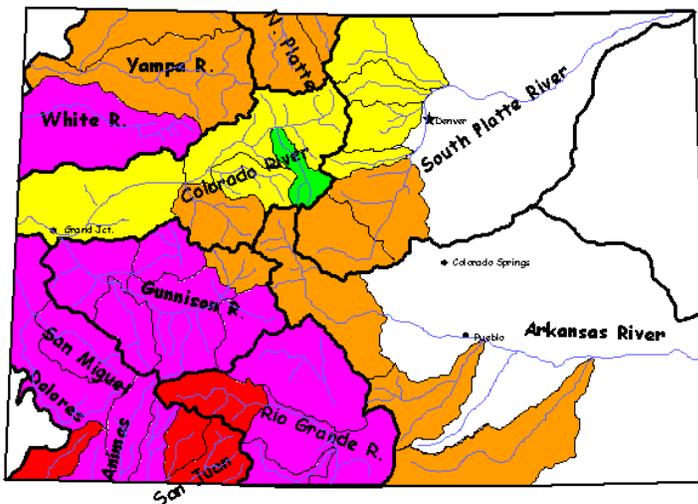
**Reservoir Storage**  
May 1, 2003



**Statewide: 60% of Average  
70% of Last Year**

## Exhibit 6

**Streamflow Forecasts**  
May 1, 2003

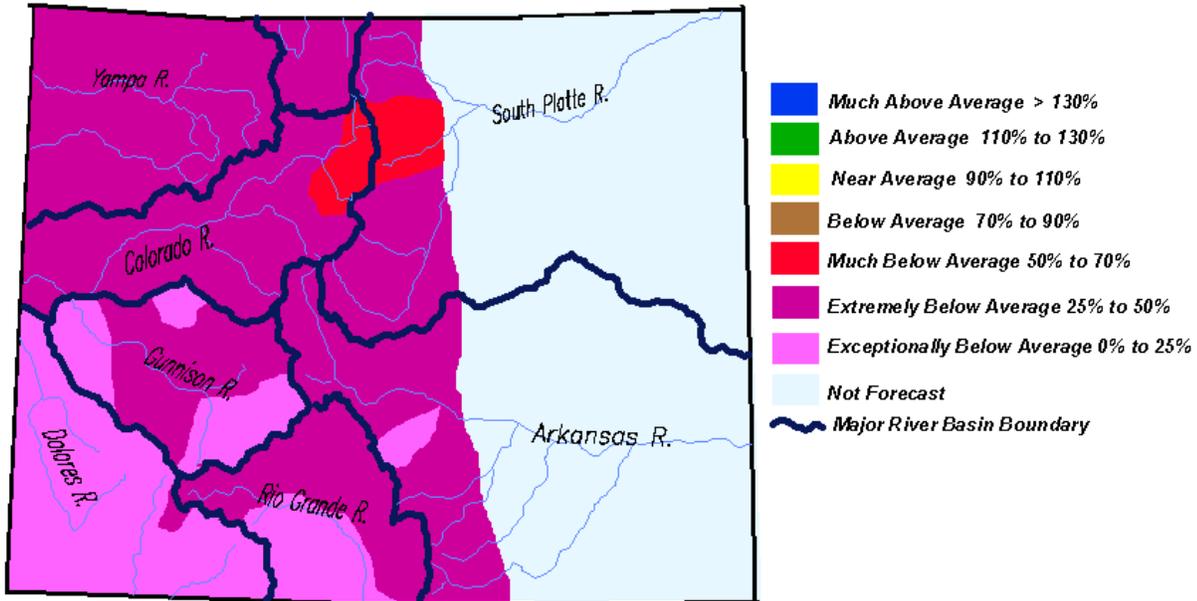


Legend

- > 150% of Average
- 130 - 150% of Average
- 110 - 129% of Average
- 90 - 109% of Average
- 70 - 89% of Average
- 50 - 69% of Average
- < 50% of Average
- Not Forecast
- Major Basin Boundary
- Watershed Boundary

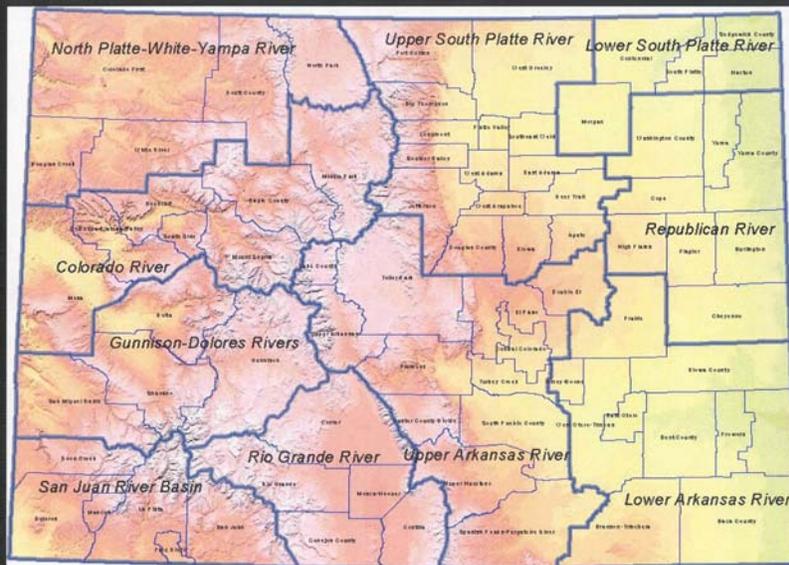
## Exhibit 7

**Streamflow Forecasts  
May 1, 2002**



## Exhibit 8

### Colorado's Watershed Approach



## Exhibit 9

### Colorado Drought Impact Summary for Grasslands by Watershed (April 2003) - TABLE 1 of 3

**RANGELAND**

**Degree of Impact on Resource(s) (1,000s Acres)<sup>1</sup>**

Watershed	Total Rangeland (estimated) <sup>2</sup>	"Critical"		"Significant"		"Limited"		"Negligible"		"Check"
Upper Arkansas River	5128.0	25%	1282.0	30%	1538.4	40%	2051.2	5%	256.4	5128.0
Lower Arkansas River	4960.3	35%	1736.1	25%	1240.1	40%	1984.1	0%	0.0	4960.3
Colorado River	1083.6	25%	270.9	30%	325.1	40%	433.4	5%	54.2	1083.6
Gunnison - Dolores Rivers	1023.5	25%	255.9	40%	409.4	30%	307.1	5%	51.2	1023.5
North Platte - White - Yampa Rivers	2274.1	20%	454.8	45%	1023.3	25%	568.5	10%	227.4	2274.1
Republican River	3308.9	30%	992.7	30%	992.7	40%	1323.6	0%	0.0	3308.9
Rio Grande River	1505.4	25%	376.4	40%	602.2	20%	301.1	15%	225.8	1505.4
Upper South Platte River	2264.6	25%	566.2	40%	905.8	30%	679.4	5%	113.2	2264.6
Lower South Platte River	1215.8	30%	364.7	35%	425.5	35%	425.5	0%	0.0	1215.8
San Juan River	1237.6	30%	371.3	30%	371.3	30%	371.3	10%	123.8	1237.6
<b>Total</b>	<b>24001.8</b>	<b>6670.9</b>		<b>7833.8</b>		<b>8445.2</b>		<b>1052.0</b>		<b>24001.8</b>

<sup>1</sup> Degree of Impact:

"Critical": Basal Cover Loss > 40%

"Significant": Basal Cover Loss > 20%, but < 40%

"Limited": Basal Cover Loss > 10%, but < 20%

"Negligible": Basal Cover Loss < 10%

<sup>2</sup> Adjusted 1997 NRI Data

## Colorado Drought Impact Summary for Grasslands by Watershed (April 2003) – Table 2 of 3

TABLE 2

PASTURELAND	Degree of Impact on Resource(s) (1,000s Acres) <sup>1</sup>									
Watershed	Total Pastureland (estimated) <sup>2</sup>	"Critical"		"Significant"		"Limited"		"Negligible"		"Check"
Upper Arkansas River	174.6	10%	17.5	35%	61.1	20%	34.9	35%	61.1	174.6
Lower Arkansas River	34.9	10%	3.5	14%	4.9	5%	1.7	71%	24.8	34.9
Colorado River	75.8	7%	5.3	20%	15.2	10%	7.6	63%	47.8	75.8
Gunnison - Dolores Rivers	98.5	7%	6.9	8%	7.9	8%	7.9	77%	75.8	98.5
North Platte - White - Yampa Rivers	178.3	17%	30.3	27%	48.1	20%	35.7	36%	64.2	178.3
Republican River	54.5	25%	13.6	40%	21.8	35%	19.1	0%	0.0	54.5
Rio Grande River	179.1	5%	9.0	4%	7.2	3%	5.4	88%	157.6	179.1
Upper South Platte River	200.3	25%	50.1	40%	80.1	27%	54.1	8%	16.0	200.3
Lower South Platte River	27.3	25%	6.8	40%	10.9	35%	9.6	0%	0.0	27.3
San Juan River	158.9	12%	19.1	16%	25.4	11%	17.5	61%	96.9	158.9
<b>Total</b>	<b>1182.2</b>	<b>162.0</b>		<b>282.6</b>		<b>193.3</b>		<b>544.2</b>		<b>1182.2</b>

Note: "Negligible" figures for Pastureland include those acres that are normally irrigated - approx. 512,000 acres total

<sup>1</sup> Degree of Impact:

"Critical": Basal Cover Loss > 40%

"Significant": Basal Cover Loss > 20%, but < 40%

"Limited": Basal Cover Loss > 10%, but < 20%

"Negligible": Basal Cover Loss < 10%

<sup>2</sup> Adjusted 1997 NRI Data

## TOTAL RANGE & PASTURE - Degree of Impact on Resource(s) (1,000s Acres) <sup>1</sup>

Table 3 of 3

Watershed	Total Range & Pastureland (estimated) <sup>2</sup>	"Critical"		"Significant"		"Limited"		"Negligible"		"Check"
Upper Arkansas River	5302.6	25%	1299.5	30%	1599.5	39%	2086.1	6%	317.5	5302.6
Lower Arkansas River	4995.2	35%	1739.6	25%	1245.0	40%	1985.9	0%	24.8	4995.2
Colorado River	1159.4	24%	276.2	29%	340.2	38%	441.0	9%	101.9	1159.4
Gunnison - Dolores Rivers	1122.0	23%	262.8	37%	417.3	28%	314.9	11%	127.0	1122.0
North Platte - White - Yampa Rivers	2452.4	20%	485.1	44%	1071.5	25%	604.2	12%	291.6	2452.4
Republican River	3363.4	30%	1006.3	30%	1014.5	40%	1342.6	0%	0.0	3363.4
Rio Grande River	1684.5	23%	385.3	36%	609.3	18%	306.5	23%	383.4	1684.5
Upper South Platte River	2464.9	25%	616.2	40%	986.0	30%	733.5	5%	129.3	2464.9
Lower South Platte River	1243.1	30%	371.6	35%	436.5	35%	435.1	0%	0.0	1243.1
San Juan River	1396.5	28%	390.3	28%	396.7	28%	388.8	16%	220.7	1396.5
<b>Total</b>	<b>25184.0</b>	<b>6832.9</b>		<b>8116.4</b>		<b>8638.5</b>		<b>1596.2</b>		<b>25184.0</b>

<b>TOTAL</b>			
<b>"Critical" and "Significant":</b>	<b>14949.29</b>	<b>&gt;&gt;&gt;&gt;</b>	<b>59% of total</b>

<sup>1</sup> Degree of Impact:

"Critical": Basal Cover Loss > 40%

"Significant": Basal Cover Loss > 20%, but < 40%

"Limited": Basal Cover Loss > 10%, but < 20%

"Negligible": Basal Cover Loss < 10%

<sup>2</sup> Adjusted 1997 NRI Data

## Exhibit 10

WATERSHED ASSOCIATION	FO	County	IRR CROP	COUNTY IRR AC	CRITICAL AC	DRY CROP	FALLOW	WINTER WHEAT	COUNTY DRY CROP AC	CRITICAL AC
<b>North Platte-White-Yampa</b>	Craig	Moffat		29,600	0	0.25			74,550	18,637.5
	Steamboat	Routt		49,900	0				52,400	0
	Walden	Jackson		123,600	0					0
	Meeker	Rio Blanco	0.3	36,000	10,800	0.5			20,000	10,000
	<b>TOTAL</b>			<b>239,100</b>	<b>10,800</b>				<b>146,950</b>	<b>28,637.5</b>
					5%					19%
<b>Colorado</b>	Kremling	Grand		39,800	0					0
		Summit		10,900	0					0
	Eagle	Eagle		16,600	0				2,900	0
	Glenwood	Pitkin	0.45	9,650	4,342.5	0.8			550	440
		Garfield		51,400	0				11,600	0
	G. Junction	Mesa		87,650	5,000					0
				216,000	0				19,900	0
<b>TOTAL</b>			<b>432,000</b>	<b>9,342.5</b>				<b>34,950</b>	<b>440</b>	
					2%					1%
<b>Gunnison-Dolores</b>	Gunnison	Hindsdale-40%			0					0
		Gunnison		51,400	0					0
	Delta	Delta	0.01	71,000	710				4,100	0
	Montrose	Montrose	0.2	85,050	17,010				4,150	0
		Ouray		18,350	0					0
	Norwood	San Miguel	0.4	12,350	4,940	0.6			15,550	9,330
	Center	Saguache		200	0					0
<b>TOTAL</b>			<b>238,350</b>	<b>22,660</b>				<b>23,800</b>	<b>9,330</b>	
					10%					39%
<b>San Juan</b>	Cortez	Montezuma	0.1	61,100	6,110	0.6			41,800	25,080
		Dolores		7,500	0				60,900	0
	Durango	La Plata		71,850	0				19,250	0
		San Juan			0					0
	Pagosa Springs	Archuleta		16,750	0				850	0
	Gunnison	Hindsdale-40%		2,300	0					0

	Monte Vista	Mineral-20%		100	0				0
				159,600	0			122,800	0
	<b>TOTAL</b>			<b>319,200</b>	<b>6,110</b>			<b>245,600</b>	<b>25,080</b>
					2%				10%
<b>Upper S. Platte</b>	Fort Collins	Larimer		77,700	0			49,650	0
	Greeley	Weld		392,900	0			439,000	0
	Longmont	Boulder		39,450	0			19,150	0
	Lakewood	Gilpin			0				0
		Clear Creek			0				0
		Jefferson		3,300	0	0.3		11,300	3,390
	Hugo	Lincoln			0			100	0
	Colorado Springs	El Paso		200	0			1,000	0
	Kiowa - Simla	Elbert	0	3,300	0			110,000	6,000
	Castle Rock	Douglas		3,600	0	0.25		36,050	9,012.5
	Lakewood	Denver		14	0				0
	Byers	Arapahoe		3,900	0	0.33		164,100	54,153
	Brighten	Adams	0.25	27,100	6,775	0.15		503,050	75,457.5
	Akron	Washington		500	0			8,000	0
				551,964	6,775			1,341,400	148,013
					1%				11%
<b>Republican</b>	Akron	Washington	0.03	55,000	1,650	0.2		789,000	157,800
	Yuma / Wray	Yuma	0.01	274,050	2,740.5	0.25		359,100	89,775
	Flagler/Burlington	Kit Carson	0.15	145,700	21,855			693,200	0
	Hugo	Lincoln		2,000	0	0.02		200,400	4,008
	Cheyenne Wells	Cheyenne		20,600	0		0.75	413,300	0
	Byers	Arapahoe			0			800	0
	<b>TOTAL</b>			<b>497,350</b>	<b>26,245.5</b>			<b>2,455,800</b>	<b>251,583</b>
					5%				10%
<b>Rio Grande</b>	Gunnison	Hinsdale-20%			0				0

	Monte Vista	Hinsdale			0				0
		Mineral-80%		100	0				0
	La Jara	Conejos	0.4	130,600	52,240			4,850	0
	San Luis	Costilla		44,000	0				0
	Alamosa	Alamosa		106,199	0				0
	Monte Vista	Rio Grande		136,150	0				0
	Center	Saguoche	0.2	207,000	41,400				0
	<b>TOTAL</b>			<b>624,049</b>	<b>93,640</b>			<b>4,850</b>	<b>0</b>
					15%				0%
<b>Upper Ark</b>	Salida	Lake		3,900	0				0
		Chaffee		24,400	0			50	0
	Colorado Springs	Park		18,000	1,500			7,300	0
	Canon City	Femont		19,300	0				0
	West Cliff	Custer		19,600	0			4,400	0
	Walsenburg	Huerfano		16,200	0			11,650	0
	Pueblo	Pueblo	0.35	35,500	12,425	0.7		44,300	31,010
	Colorado Springs	El Paso		14,800	0			62,300	0
		Teller		1,650	0			3,150	0
	Kiowa	Elbert		2,800	0			62,600	0
	Hugo	Lincoln		100	0			5,000	0
	Trinidad	Las Animas		22,000	0			20,000	0
	<b>TOTAL</b>			<b>178,250</b>	<b>13,925</b>			<b>220,750</b>	<b>31,010</b>
					8%				14%
<b>Lower S. Platte</b>	Fort Morgan	Morgan		142,200	0	0.25		200,000	50,000
	Greeley	Weld		200	0			50,000	0
	Sterling	Logan		109,200	0	0.1		414,700	41,470
	Julesburg	Sedgwick		51,700	0			145,650	0
	Holy Oak	Phillips		87,800	0			300,800	0
	<b>TOTAL</b>			<b>391,100</b>	<b>0</b>			<b>1,111,150</b>	<b>91,470</b>
					0%				8%
Lower Ark	Hugo	Lincoln		2,400	0			270,000	0
	Pueblo	Pueblo		150	0			10,000	0

	Rocky Ford	Crowley	40	21,650	38,000				32,050	10,000
	Spingfield	Baca		65,050	0				567,500	0
	Lamar	Prowers		111,100	0				334,250	0
	Las Animas	Bent		62,700	0				56,450	0
	Rocky Ford	Otero		63,000	0				2,050	0
	Eades	Kiowa		5,900	0	0.3			487,700	146,310
	Trinidad	Las Animas		2,000	0				32,900	0
	<b>TOTAL</b>			<b>333,950</b>	<b>38,000</b>				<b>1,792,900</b>	<b>156,310</b>
					11%					9%
<b>GRAND TOTAL</b>				<b>3,805,313</b>	<b>227,498</b>				<b>7,378,150</b>	<b>741,873.5</b>
					6%					10%

## Exhibit 11

Acres of private forestland of ponderosa pine, lodgepole pine and pinyon-juniper forest types that are being critically stressed by drought within each forested watershed association boundary.

<b>Watershed Assoc.</b>	<b>Ponderosa</b>	<b>Lodgepole</b>	<b>Pinyon-juniper</b>
North Platte-Yampa	0	39,450 of 78,900	29,200 of 116,930
Colorado	1,900 of 3,800	54,650 of 109,300	24,300 of 48,600
Gunnison-Dolores	11,300 of 22,600	6,550 of 13,100	45,000 of 90,000
San Juan	57,550 of 115,100	0	850 of 1,700
Upper S. Platte	169,600 of 339,360	86,784 of 173,568	2,200 of 8,800
Rio Grande	3,300 of 6,600	1,800 of 3,600	29,950 of 59,900
Upper Arkansas	150,400 of 300,800	16,300 of 32,700	153,700 of 307,400
<b>Total:</b>	<b>786,200</b>	<b>205,534</b>	<b>205,200</b>

**Treatment needs:**

- Forest Stand Improvement with slash treatment for removal of dead/dying trees for fuels reduction and insect control
- Fire Breaks
- Pest Management for insect and weed control treatments
- Tree/Shrub Establishment for reforestation
- Range Reseeding for erosion control
- Prescribed Burning for fuels reduction

## Exhibit 12

Water Management Needs	Action Item	Sites	Equipment Cost	FTEs
<ol style="list-style-type: none"> <li>1. Implement more frequent volumetric streamflow forecasts (mid-month forecasts).</li> <li>2. Develop critical threshold forecasts.</li> <li>3. Develop peak potential forecasts.</li> </ol>	Upgrade existing snow courses with SNOTEL sites	80	\$2,000,000	4
<ol style="list-style-type: none"> <li>1. Improve existing forecast accuracy.</li> <li>2. Implement new runoff forecasts in currently non-forecasted areas.</li> </ol>	Fill in existing voids within the SNOTEL network	18	450,000	.5
<ol style="list-style-type: none"> <li>1. Integrate soil moisture data into forecast procedures.</li> <li>2. Implement advanced simulation models in forecasting.</li> <li>3. Provide fire weather data to land management agencies.</li> </ol>	Upgrade all SNOTEL sites with SCAN sensors (snow depth, soil moisture/temperature @ 3 depths, wind speed /direction and transceiver upgrade).	85	561,000	1.5
<ol style="list-style-type: none"> <li>1. Monitor soils and climatological factors affecting drought severity at lower elevations.</li> <li>2. Create a baseline soil moisture network to allow county level drought decisions.</li> </ol>	Install a minimum of one SCAN site per county	63	1,575,000	3
<ol style="list-style-type: none"> <li>1. Improve drought assessment.</li> </ol>	Develop a standardized West-Wide Surface Water Supply Index (SWSI)			
<ol style="list-style-type: none"> <li>1. Monitor daily reservoir storage, rather than existing monthly storage.</li> </ol>	Install meteor-burst sites at critical reservoirs to monitor storage volumes.	50	375,000	1
<b>TOTALS</b>			<b>\$4,964,000</b>	<b>10</b>

## Exhibit 13

### Colorado Drought Information/Education Action Plan 2003

#### Rangeland and Pastureland

**Critical Issue:** Protect severely and critically impacted rangeland and pastureland in Colorado.

**Customer:** Ranchers

**Customer Needs:** Information about how the rangeland and pastureland have been impacted by the drought, how to develop and implement prescribed grazing management, and how to re-seed their rangeland or Pastureland, if necessary, to restore their rangeland or Pastureland to a healthy state. Along with the information, the ranchers need technical assistance and potentially financial assistance.

**Identify Partners:** USDA Natural Resources Conservation Service, USDA Farm Service Agency, Colorado Association of Conservation Districts, Colorado State Conservation Board, the conservation districts, Colorado Department of Agriculture, Colorado GLCI Committee, Colorado Cattlemen’s Association, Colorado Wool Growers Association, Colorado Weed Management Association, Alpaca Breeders of the Rockies, CSU Climate Center, CSU Cooperative Extension, Colorado Section of the Society for Range Management, Colorado Chapter of the Soil and Water Conservation Society, US Forest Service, Bureau of Land Management.

**Broad Strategy we will use to meet customers needs:** Form a coalition of organizations to work together in distributing information/education products to ranchers and in giving the ranchers the help they need to protect their rangeland and Pastureland and restore it to a healthy state.

**Action Goals:**

- Have prescribed grazing systems used on 6,989,000 acres of Colorado’s rangeland and Pastureland by 2009.
- Garner active support and promotion of prescribed grazing systems by conservation districts, other agencies, and agricultural organizations.
- Increase ranchers’ understanding of the benefits of using a prescribed grazing system.
- Re-seed, if necessary, 333,500 acres of severely or critically impacted rangeland and Pastureland.

Activity	Who	Cost	Start	End
Sponsor workshops to educate ranchers on prescribed grazing systems and their benefits, restocking strategies after drought, and monitoring their rangeland and Pastureland. Specifically target ranchers with drought EQIP contracts and those who have the most impacted rangeland.	NRCS, CACD, Colorado GLCI Cmte., CDs, CSCB, CSU CE, SRM, SWCS, USFS, BLM	Varies \$250-\$500	1/03	12/03
Develop technical notes on restocking strategies, prescribed grazing, and monitoring for distribution to ranchers impacted by the drought, specifically targeting ranchers who have rangeland drought EQIP contracts from 2002 and those who have the most impacted rangeland. Use workshops and possibly a direct mailing (5,000 copies each).	NRCS, CSU CE, CO GLCI Committee	\$3,200	1/03	3/03

Activity	Who	Cost	Start	End
Develop a series of articles for the media and other organizations' newsletters that make ranchers aware of the problems, give them guidance on how to address the problems, and explain what NRCS is doing to help address the problems. (Topic ideas: restocking strategies, prescribed grazing and its benefits, monitoring your rangeland, technical and financial assistance available from NRCS, how to re-seed, if necessary). Look at ideas to specifically target ranchers who need this information the most—those whose rangeland is severely to critically impacted—possibly a direct mailing, possibly additional follow-up workshops.	NRCS	\$0	5/03	7/03
Develop a general fact sheet on the drought, its adverse impacts, how conservation can minimize its impacts, and what the Colorado Conservation Partnership is and what it does to help minimize the effects of drought. Use this as a general piece of information at CD meetings, ag organization meetings or as a basis for some articles for the media and for newsletters (5,000 color copies).	NRCS, CSU Colorado Climate Center	\$2,200	3/03	7/03
Sponsor a tour for media and legislators to show the impact of the drought on Colorado's resources. Target Colorado Congressional delegation members, their staff, state legislators, and regional, state, and local media. Also invite other ag organizations as was done on the 2002 Drought Tour sponsored by CACD.	CACD, NRCS	\$2,000	6/03	8/03
Continually update Colorado NRCS's website to have all, NRCS articles, and publications on the drought in addition to working with other organizations To have links to our website and to some other websites that provide drought information.	NRCS	\$0	5/03	8/03
Assess and possibly revise a Montana publication done in 1982 titled "Are you ready for the next drought?" Have this available at FOs and for use at other ag organization meetings and workshops. Assess whether NRCS should also develop a presentation to go along with this that can be used at other ag organization meetings or workshops. Look at holding workshops on this topic (5,000 copies)	NRCS	\$2,500	5/03	12/03
Develop a PowerPoint presentation titled "Using Conservation Practices to Drought-Proof Your Operation." Have this available for use by NRCS staff from field, area, or state offices who give presentations to other organizations, specifically targeting CD meetings and other ag organization meetings.	NRCS	\$0	5//03	8/03

<b>Activity</b>	<b>Who</b>	<b>Cost</b>	<b>Start</b>	<b>End</b>
Develop a publication titled “Weathering Tough Times” that outlines Colorado’s drought history, gives some background about droughts in general, and lists drought- and conservation-related resources from Federal and state agencies. Distribute at 2003 Colorado Ag Outlook Forum in the Colorado Conservator.	NRCS (Petra Barnes) Col. Dept. of Ag, CSU CE, FSA, RD	\$0	1/03	1/03
Develop an article for media and other organizations’ newsletters on why it is not a good idea to sodbust native rangeland, or pastureland or CRP land during drought and while recovering from drought. Target ranchers with the most impacted rangeland and CRP contract holders in areas with the highest potential for wind erosion (bad soils, low rainfall, etc.).	NRCS	\$0	5/03	6/03
Develop an article and fact sheet on how to maintain a healthy windbreak during drought and while recovering from drought. Target producers who have received NRCS cost-share dollars to install these windbreaks. Can also be distributed to others with windbreaks installed by other means (5,000 copies)	NRCS	\$500	5/03	6/03
Develop an article on the potential weed problems during and while recovering from drought. Distribute to media and other ag organizations for their newsletters.	NRCS	\$0	5/03	8/03
Develop some PSAs and news articles describing how specific conservation practices can mitigate drought impacts. Distribute them to radio stations and media in Colorado. Also make the articles available for other organizations’ newsletters.	NRCS	\$5,000 (??)	5/03	7/03
Revise South Dakota article on proper timing of spring grazing and distribute to media and other organizations for their newsletters.	NRCS	\$0	5/03	5/03
Revise GLCI Technical Notes #2 and #3 (5,000 copies)	NRCS	\$1,000	5/03	8/03
Develop a display with the potential theme of prescribed grazing or what NRCS is doing to help mitigate the effects of the drought on rangeland or how to recover from the drought and be prepared for the next. Have this for use at Colorado Cattlemen’s Association, Colorado Wool Growers, Colorado Farm Bureau, ... meetings. Also have publications developed in this plan available for distribution. Make sure an NRCS staff member is in attendance at these meetings to discuss what we are doing and what can be done to take care of the resources, etc.				
Develop some success stories on how we have assisted ranchers, irrigated farmers, dry cropland farmers, and private forestland residents and owners in protecting their resources. Distribute them to media and NHQ.	NRCS	\$0	7/03	12/03

<b>Activity</b>	<b>Who</b>	<b>Cost</b>	<b>Start</b>	<b>End</b>
Continue to document through photography resource conditions	NRCS	\$500	5/02	12/03
Develop a monitoring training publication that will be used as a training tool for NRCSers, ranchers, etc. Photos points in Pueblo, Crowley, and Otero counties will be used in the publication.	NRCS CSU CE, CO GLCI Cmte.	\$5,000-\$7,500	5/03	5/04

## Irrigated Cropland

**Critical Issue:** Protect severely and critically impacted irrigated cropland in Colorado.

**Customer:** Irrigated farmers

**Customer Needs:** Information about how the irrigated cropland has been impacted by the drought and lack of irrigation water, why it is important to plant, using minimum or no-till, some type of cover crop on their land, types of low water requiring crops, why it is important to use efficient irrigation methods, and how to irrigate efficiently. Along with the information, the irrigated farmers need technical assistance and potential financial assistance.

**Identify Partners:** USDA Natural Resources Conservation Service, USDA Farm Service Agency, Colorado Association of Conservation Districts, Colorado State Conservation Board, the conservation districts, CSU Colorado Climate Center, Colorado Department of Agriculture, CSU Cooperative Extension, Colorado Water Conservation Board, Colorado State Engineer, the conservancy districts, ditch or canal companies, groundwater associations, USDI Bureau of Reclamation, Colorado Farm Bureau, Rocky Mountain Farmers Union, Colorado Corn Growers Association, Colorado Water Resources Research Institute, Colorado Potato Administrative Committee Colorado Young Farmers Educational Association, Colorado Apple Administrative Committee, Colorado Weed Management Association, Colorado Wheat Administrative Committee, Colorado Association of Wheat Growers, Colorado Hay and Forage Association, Colorado Onion Association, and Colorado Chapter of the Soil and Water Conservation Society.

**Broad Strategy we will use to meet customers needs:** Form a coalition of organizations to work together in distributing information/education products to irrigated farmers and in giving the irrigated farmers the help they need.

### Action Goals:

- Have cover crops planted on \_\_\_\_\_ acres of Colorado’s irrigated cropland by \_\_\_\_\_.
- Garner active support and promotion of planting cover crops, using minimum or no-till, and using efficient methods by conservation districts, other agencies, and ag organizations.
- Increase irrigated farmers’ understanding of the benefits having a cover crop, using minimum or no-till, and using efficient irrigation methods.

Activity	Who	Cost	Start	End
Develop a series of articles for the media and other organizations’ newsletters that make irrigated farmers aware of the problems, give them guidance on how to address the problems, and explain what NRCS is doing to help address the problems. (Topic ideas: technical and financial assistance available from NRCS, when water is leased who will be responsible for planting the cover crops, tools to help a farmer irrigate efficiently, efficient irrigation methods, importance of using no-till or minimum till, low water requiring crops).	NRCS	\$0	5/03	7/03
Develop a general fact sheet on the drought, its adverse impacts, how conservation can minimize its impacts, and what the Colorado Conservation Partnership is and what it does to help minimize the effects of drought. Use this as a general piece of information at CD meetings, ag organization meetings, or as the basis for some articles for the media and for newsletters. (5,000 color copies).	NRCS, CSU Colorado Climate Center	\$2,200	3/03	7/03
Sponsor a tour for media and legislators to show the impact of the drought on Colorado’s resources. Target Colorado Congressional delegation members, their staff, state legislators, and regional, state, and local media. Also invite other ag organizations as was done on the 2002 Drought Tour sponsored by CACD.	CACD, NRCS	\$2,000	6/03	8/03

Activity	Who	Cost	Start	End
Continually update Colorado NRCS's website to have all articles, publications re: drought done by NRCS on it in addition to working with other organizations to have links to our website and to some other websites that provide drought information.	NRCS	\$0	5/03	8/03
Look over "Southeast Colorado Irrigators' Guide" developed by Area 3 and the CSU Cooperative Extension "Best Management Practices for Irrigation Management," assess the usefulness of each, and decide whether to revise/reprint them. Target irrigated farmers in watersheds where the irrigation water is most limited, whether it is groundwater or surface water.	NRCS (Colorado Irrigation Tech Group)	\$10,000	5/03	12/04
Develop a powerpoint presentation titled "Using Conservation Practices to Drought-Proof Your Operation." Have this available for use by NRCSers from field, area, or state offices who give presentations to other organizations, specifically targeting CD meetings and other ag organization meetings.	NRCS	\$0	5//03	8/03
Develop a publication titled "Weathering Tough Times" that outlines Colorado's drought history, gives some background about droughts in general, and lists drought- and conservation-related resources from Federal and state agencies. Distribute at 2003 Colorado Ag Outlook Forum in the Colorado Conservator, ...	NRCS (Petra Barnes) Col. Dept. of Ag, CSU CE, FSA, RD	\$ ____	1/03	1/03
Continue to supply snowpack and water supply conditions information through the NRCS website and news releases.	NRCS	\$0	1/03	??
Develop an article and fact sheet on how to maintain a healthy windbreak during drought and while recovering from drought. Target producers who have received NRCS cost-share dollars to install these windbreaks. Can also be distributed to others with windbreaks installed by other means. (5,000 copies)	NRCS	\$500	5/03	6/03
Develop an article on the potential weed problems during and while recovering from drought. Distribute to media and other ag organizations for their newsletters.	NRCS	\$0	5/03	8/03
Develop some PSAs and news articles describing how specific conservation practices can mitigate drought impacts. Distribute them to radio stations and media in Colorado. Also have the articles available for other organizations' newsletters.	NRCS	\$5,000 (??)	5/03	7/03
Assess usefulness of Montana's Drought Survival: Tips for Irrigators. Revise if decision is to print. Distribute to irrigators who are most impacted by lack of irrigation water. (5000 copies)	NRCS Colorado Irrigation Tech Group	\$1,000	5/03	8/03

<b>Activity</b>	<b>Who</b>	<b>Cost</b>	<b>Start</b>	<b>End</b>
Develop some success stories on how we have assisted ranchers, irrigated farmers, dry cropland farmers, and private forestland residents and owners in protecting their resources. Distribute them to media and NHQ.	NRCS	\$0	7/03	12/03
Develop some specific strategies for the Lower Arkansas River Valley irrigated lands due to the fact that approximately 25%-50% of the irrigated land could be barren due to lack of irrigation water or water leasing which could last up to three years. Look at how to provide information to farmers on establishing a cover crop to protect their land from water and wind erosion, what they will need to do when the lease is up, etc. Use this as a guide for any other river basin where this situation could occur or where there will be barren irrigated ground due to the lack of irrigation water. Potential products could be fact sheets for direct mailing to specific producers, news articles, workshops, a display, ...	NRCS	???	5/03	8/03

## Dry Cropland

**Critical Issue:** Protect severely and critically impacted dry cropland in Colorado.

**Customer:** Dry Cropland Farmers

**Customer Needs:** Information about how dry cropland has been impacted by the drought, why it is important to plant, using minimum or no-till, some type of cover crop on their land, types of low water requiring crops. Along with information, the farmers need technical assistance and potential financial assistance.

**Identify Partners:** USDA Natural Resources Conservation Service, USDA Farm Service Agency, Colorado Association of Conservation Districts, Colorado State Conservation Board, the conservation districts, Colorado Department of Agriculture, CSU Colorado Climate Center, CSU Cooperative Extension, Colorado Farm Bureau, Rocky Mountain Farmers Union, Colorado Corn Growers Association, Colorado Potato Administrative Committee Colorado Young Farmers Educational Association, Colorado Wheat Administrative Committee, Colorado Association of Wheat Growers, Colorado Weed Management Association, Colorado Hay and Forage Association, and Colorado Chapter of the Soil and Water Conservation Society.

**Broad Strategy we will use to meet customers needs:** Form a coalition of organizations to work together in distributing information/education products to dry cropland farmers and in giving the dry cropland farmers the help they need.

**Action Goals:**

- Have cover crops planted on \_\_\_\_\_ acres of Colorado’s dry cropland by \_\_\_\_\_.
- Garner active support and promotion of planting cover crops, using minimum or no-till, by conservation districts, other agencies, and ag organizations.
- Increase dry cropland farmers’ understanding of the benefits having a cover crop, and using minimum or no-till.

Activity	Who	Cost	Start	End
Develop a series of articles for the media and other organizations’ newsletters that make dry cropland farmers aware of the problems, give them guidance on how to address the problems, and explain what NRCS is doing to help address the problems. (Topic ideas: technical and financial assistance available from NRCS, importance of using no-till or minimum till when planting a cover crop, low water requiring crops).	NRCS	\$0	5/03	7/03
Develop a general fact sheet on the drought, its adverse impacts, how conservation can minimize its impacts, and what the Colorado Conservation Partnership is and what it does to help minimize the effects of drought. Use this as a general piece of information at CD meetings, ag organization meetings, or as a basis for some articles for the media and for newsletters. (5,000 color copies).	NRCS, CSU Colorado Climate Center	\$2200	3/03	7/03
Sponsor a tour for media and legislators to show the impact of the drought on Colorado’s resources. Target Colorado Congressional delegation members, their staff, state legislators, and regional, state, and local media. Also invite other ag organizations as was done on the 2002 Drought Tour sponsored by CACD.	CACD, NRCS	\$2000	6/03	8/03
Continually update Colorado NRCS’s website to have all articles, publications re: drought done by NRCS on it in addition to working with other organizations to have links to our website and to some other websites that provide drought information.	NRCS	\$0	5/03	8/03

<b>Activity</b>	<b>Who</b>	<b>Cost</b>	<b>Start</b>	<b>End</b>
Develop a powerpoint presentation titled "Using Conservation Practices to Drought-Proof Your Operation." Have this available for use by NRCSers from field, area, or state offices who give presentations to other organizations, specifically targeting CD meetings and other ag organization meetings.	NRCS	\$0	5//03	8/03
Develop a publication titled "Weathering Tough Times" that outlines Colorado's drought history, gives some background about droughts in general, and lists drought- and conservation-related resources from Federal and state agencies. Distribute at 2003 Colorado Ag Outlook Forum in the Colorado Conservator, ...	NRCS (Petra Barnes) Col. Dept. of Ag, CSU CE, FSA, RD	\$ _____	1/03	1/03
Develop an article and fact sheet on how to maintain healthy windbreaka during drought and while recovering from drought. Target producers who have received NRCS cost-share dollars to install these windbreaks. Can also be distributed to others with windbreaks installed by other means. (5000 copies)	NRCS	\$500	5/03	6/03
Develop an article on the potential weed problems during and while recovering from drought. Distribute to media and other ag organizations for their newsletters.	NRCS	\$0	5/03	8/03
Develop some PSAs and news articles describing how specific conservation practices can mitigate drought impacts. Distribute them to radio stations and media in Colorado. Also have the articles available for other organizations' newsletters.	NRCS	\$5000 (??)	5/03	7/03
Develop some success stories on how we have assisted ranchers, irrigated farmers, dry cropland farmers, and private forestland residents and owners in protecting their resources. Distribute them to media and NHQ.	NRCS	\$0	7/03	12/03
Assess usefulness of Montana's Drought Survival: Tips for Dryland Farmers. Revise if decision is to print. Distribute to dryland farmers in most impacted areas of Colorado. (5000)	NRCS	\$1000	5/03	8/03

## Private Forestland

**Critical Issue:** Protect severely and critically impacted private forestland in Colorado.

**Customer:** Private Forestland Owners and Residents

**Customer Needs:** Information about how the private forestland has been impacted by the drought, how to deal with beetle infestations that increase conditions favorable to wildfires, and the importance of defensible space around homes and buildings. Along with the information, private forestland residents and owners technical assistance and potential financial assistance.

**Identify Partners:** USDA Natural Resources Conservation Service, USDA Farm Service Agency, Colorado Association of Conservation Districts, Colorado State Conservation Board, the conservation districts, Colorado Department of Agriculture, CSU Cooperative Extension, Colorado Weed Management Association, Colorado State Forest Service, US Forest Service, and Colorado Chapter of the Soil and Water Conservation Society.

**Broad Strategy we will use to meet customers needs:** Form a coalition of organizations to work together in distributing information/education products to private forestland residents and owners and in giving the private forestland residents and owners the help they need.

### Action Goals:

- Have management plans on \_\_\_\_\_ acres of Colorado’s private forestlands by \_\_\_\_\_.
- Garner active support and promotion of developing management plans to deal with beetle infestations and having defensible space around homes and buildings by conservation districts, other agencies, and other organizations.
- Increase dry cropland farmers’ understanding of the benefits having a cover crop.

Activity	Who	Cost	Start	End
Develop an article on the potential weed problems during and while recovering from drought. Distribute to media and other ag organizations for their newsletters.	NRCS	\$0	5/03	8/03
Develop an article and fact sheet that explains how to develop management plans that address mountain pine beetle, spruce beetle, and other pest infestations that increase conditions favorable to wildfires. (5000 copies)	NRCS, CSFS, USFS	\$500	5/03	8/03
Develop a news article and fact sheet on defensible space around homes on private forestland. (5000 copies)	NRCS	\$500	5/03	9/03
Develop some PSAs and news articles describing how specific conservation practices can mitigate drought impacts. Distribute them to radio stations and media in Colorado. Also have the articles available for other organizations’ newsletters.	NRCS	\$5000 (??)	5/03	7/03
Develop some success stories on how we have assisted ranchers, irrigated farmers, dry cropland farmers, and private forestland residents and owners in protecting their resources. Distribute them to media and NHQ.	NRCS	\$0	7/03	12/03
Continually update Colorado NRCS’s website to have all articles, publications re: drought done by NRCS on it in addition to working with other organizations to have links to our website and to some other websites that provide drought information.	NRCS	\$0	5/03	8/03

**Important to note:** This is a working document. An important phase of having an information plan, is once we have begun using it to accomplish our goals, we need to step back and evaluate to see what changes might be needed to make our efforts

*more successful. There are two times to conduct an evaluation of this plan. “During”—this allows for us to make mid-course adjustments. “After”—this evaluation measures how well we have achieved our goal. One of the Colorado NRCS’ goals is to make sure that we get needed information into the hands of those farmers and ranchers who need it the most. We may need to look more closely at the targeting of some of the information products.*

*One step left to add to this plan is more specific names of individuals and organizations under the who column.*

*NOTE: All costs lists are estimates.*

## Exhibit 14

<b>Staff Position Needed</b>	<b>Performance Measure</b>	<b>Current Staffing Level and Activities Under Taken</b>	<b>Full Time Employees Shortage</b>	<b>Starting Date</b>	<b>Ending Date</b>	<b>Three Year Financial Obligation</b>
Range Conservationist	Provide Assistance on Rangeland and Pastureland (deferment, reseeding, repair and protection) 14.3 million acres to be treated over 3 years.	18.7 Range Conservationist currently tasked with providing EQIP, WHIP, CRP, and GLCI assistance	18.7 full time employees needed to provided drought assistance	7/1/2003	6/30/2006	\$4,290,000
Irrigation Water Management Specialist	Four IWM Specialist are needed to provide additional assistance to landowners regarding irrigation alternatives which coincide with drought and irrigation	The state has advertised two positions	2 full time employees needed	7/1/2003	6/30/2006	\$499,080
Public Affairs	Provide information and education materials related to drought (website management, fact sheet development, and news articles)	2 Information Specialist on staff for the state	1 full time employee needed	7/1/2003	6/30/2006	\$249,540
Hydrologist	Provide monitoring assistance to the snow survey team to assist in providing timely update on snow melt and reservoir capacity	The state currently lacks a hydrologist (see water management needs spread sheet)	1 full time employee needed	7/1/2003	6/30/2006	\$249,540
Hydrology Technician	Provide monitoring assistance to the snow survey team in providing timely updates on snow melt and reservoirs capacity	The state currently lacks a hydrology technician (see water management needs spread sheet)	1 full time employee needed	7/1/2003	6/30/2006	\$206,100
Civil Engineering Technicians	Provide assistance on irrigated cropland which has required adaptation due to the impact of the drought, assist in providing timely designs to landowners involving irrigation design and water development projects	These positions are currently being reviewed at the national level currently the state has eight civil engineering technicians	6 full time employees needed	7/1/2003	6/30/2006	\$1,011,600
Forest Manager	Provide landowners with defensible space plans	Colorado State Forest Service is working with landowners	4 full time employees needed	7/1/2003	6/30/2006	\$953,400
<b>TOTALS</b>			<b>29.7 FTE</b>			<b>\$7,459,260</b>

