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**Abstract**

*Nearly every business in every geographic region of Colorado was impacted by the 2000-2003 drought in one way or another. This chapter presents a summary of the impacts identified by Colorado's water users and the severity of the impact by both water use type and geographic region of the state as measured by the Drought & Water Supply Assessment.*

**Introduction**

The severity and duration of drought conditions in Colorado over the past several years has had significant effects on water supply across all regions of the state, without sparing any particular type of water entity or organization. According to Colorado Water Conservation Board (CWCB) estimates, in 2002 Colorado experienced a \$1.1 billion impact to agriculture, tourism, and recreation from the drought, related to diminishing crop yields, record low fishing license sales, municipal water restrictions, and other economic losses. These economic impacts will likely have long-term ramifications for years to come.

**Impacts by Water Use**

The assessment was designed to analyze specific types of drought impacts by type of water use and region to identify overall trends by water use and within the major river basins. As might be expected, the drought impacted each segment of water use, such as agricultural, municipal, or industrial, in both unique and common ways. The drought impact analysis of the assessment highlights notable differences between the agricultural and municipal segments, while all other segments (industry, federal, State, water conservancy districts, etc.) parallel overall results. Figure 13-1 illustrates the differences between the impacts to the agricultural and municipal water user segments.

Among agricultural respondents, loss of crop yield is viewed as the largest impact of the drought, with almost 70% of all respondents indicating a severe impact. Loss of reliable water supply followed closely behind, with about 60% severity rating with agricultural water users. Loss of livestock, loss of operations revenues, and loss of system flexibility were also cited by approximately one third or more respondents in the agricultural sector as severe impacts. The severity of the drought impacts was found to increase with the size of agricultural entity as indicated by irrigated acreage. The largest respondents, those that irrigate or provided irrigation water to more

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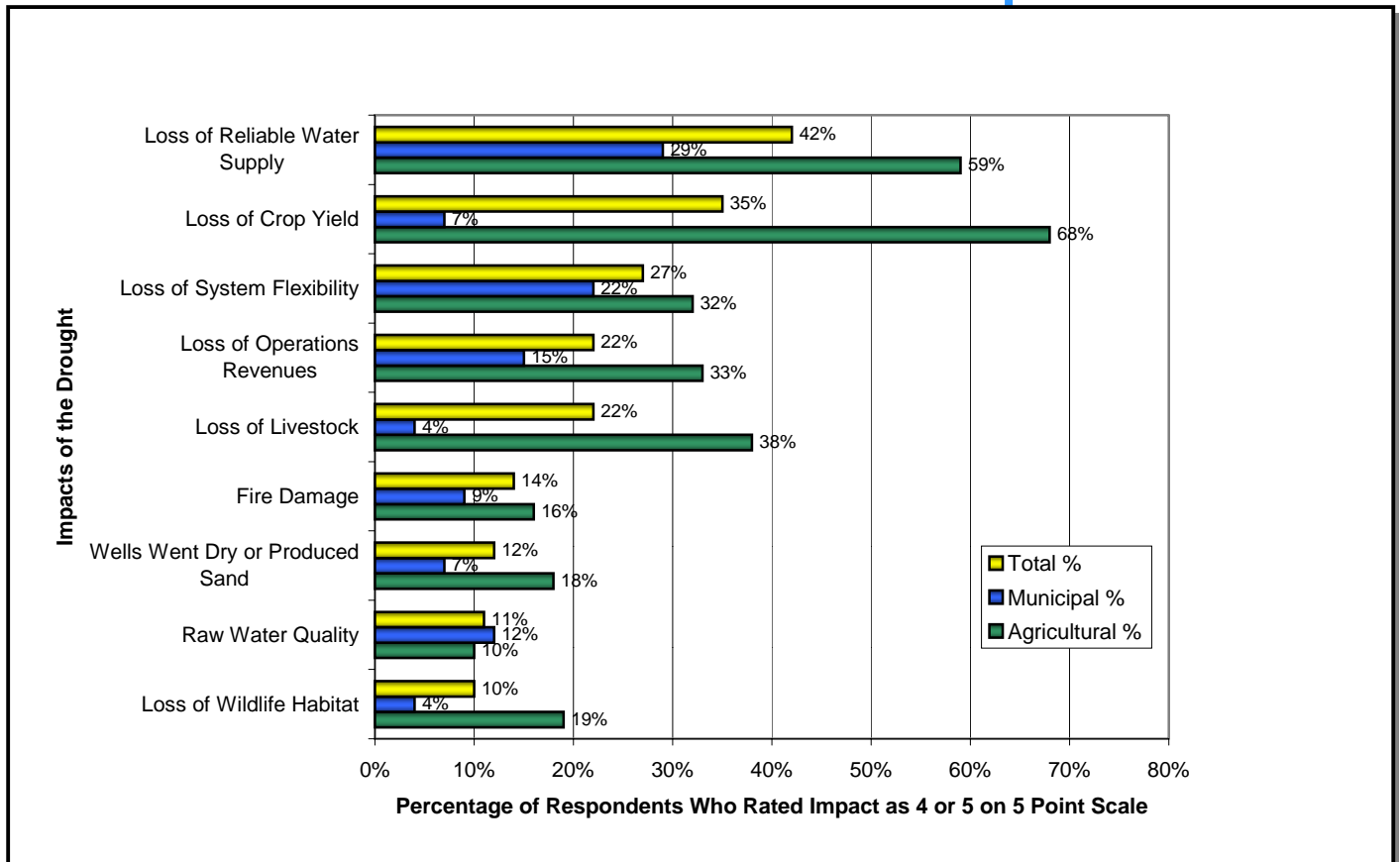
**Impacts by Water Use**

**Impacts by Geography**

**Discussion**

than 6,400 acres, rated impacts as more severe than their smaller counterparts.

Figure 13-1: Impacts of Drought on Colorado Water Entities (by Segment)



In the municipal segment, loss of reliable water supply and loss of system flexibility were flagged as the areas of greatest drought impact. As with the agricultural segment, larger municipal entities — those serving populations of more than 10,000 — rated impacts of drought consistently higher than did smaller municipal respondents.

When compared to their agricultural counterparts, significantly fewer municipal respondents rated any specific drought impact in the high 4 and 5 categories. As described above, five separate drought impact categories were cited by at least one third of agricultural entities with 4 and 5 impact ratings. In contrast, in no instance did one third of all municipal entities rate an impact area as being severe. Loss of reliable water supply was the closest with 29% naming this impact as significant. In fact, loss of reliable water supply topped the municipal segment’s list of impacts with only 20% indicating a severe impact. In contrast, an overwhelming majority of agricultural respondents, almost 70%, indicated that loss of crop yield was a severe impact of

drought. The agricultural sector, as a whole, rated the drought's impact as higher, or more significant, than municipal entities in the survey. Table 13-1 presents a summary of the reported impacts by water user type.

**Table 13-1: Top Drought Impacts by Segment (in order of reported severity)**

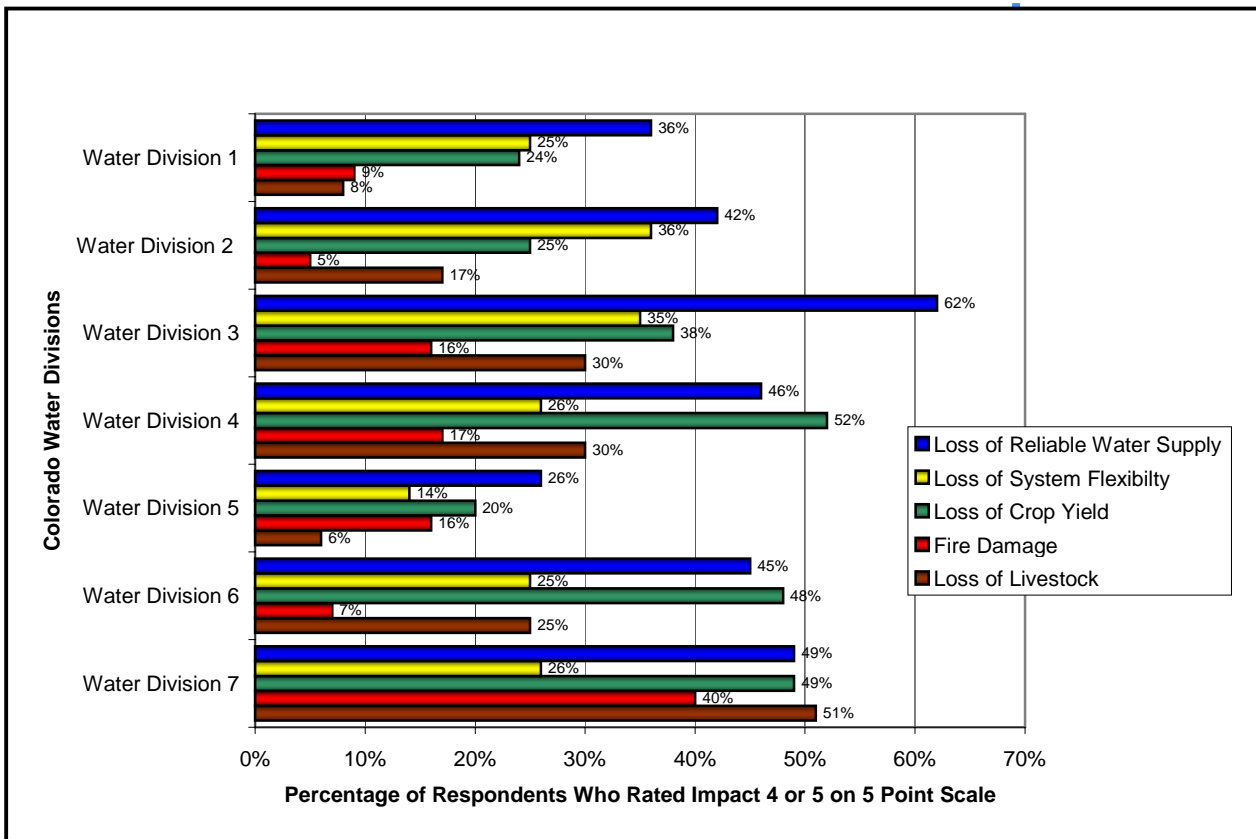
Segment	Impact and Percent of Respondents That Rated Impact as 4 - 5
Agricultural	Loss of crop yield (68%)
Water Conservancy District	Loss of livestock (67%) and Loss of crop yield (63%)
Federal	Fire damage (57%)
State	Loss of crop yield (55%)
Other	Loss of livestock (41%) and Loss of crop yield (41%)
Power	Loss of reliable water supply (40%)
Industry	Loss of system flexibility (38%)
Municipal	Loss of reliable water supply (29%)

Based on the results from all segments, it can be seen that municipalities and industry reported the least severe impacts by the drought, and that agricultural entities and water conservancy districts were the most severe impacts.

**Impacts by Geography**

Figure 13-2 presents the breakdown of reported drought impacts by major river basin. All the major river basins had severe drought impacts identified by the different water users; however, Divisions 3

**Figure 13-2: Level of Specific Impacts of Drought on Water Divisions**



and 7 had the most severe impacts reported. Division 3 had the single-most severe drought impact report – a report related to loss of reliable water supply with more than six out of ten entities indicating this as a severe impact. Divisions 1, 2, 4 and 5 also reported loss of reliable water supply as its most severe drought impact, but less than half of the water users in these divisions felt that the impact was severe. In fact, only one in four entities in Division 5 felt the impact related to the loss of reliable water supply was severe.

Division 3 also indicated a severe impact related to losses of system flexibility at a rate of about three and one-half in ten. Division 4 had the most severe loss of crop yield based on the number of respondents (over one-half) that indicated a severe impact; Division 7 had just less than one-half of its participants indicate a severe loss of crop yield.

Division 7 had the greatest number of participants that indicated a severe impact related to fire damage and livestock loss. In addition, Division 7 had the greatest total percentage of impacts with an average severity for all reported impacts of over 40%. Division 5, on the other hand, indicated the least severe impacts with an average impact severity of about 15%.

### **Discussion**

Statewide and within each division, the agricultural water users and water conservancy districts reported the most severe impacts from the 2000-2003 drought followed by federal and state entities. About seven of every ten agricultural entities reported a severe impact to crop yield, and roughly the same rate was reported by water conservancy districts regarding the severity of impacts to livestock. Municipalities were affected, but much less severely, with the most significant impact being loss of reliable water supply, which severely impacted three out of every ten entities statewide. Two of every ten municipalities reported severe impacts to water system flexibility. The top five severe drought impacts reported are shown at right.

For both municipal and agricultural water users, the larger entities (based on population served or irrigated acres, respectively) had the greatest severity of reported impacts.

Regionally, Division 7 followed by Division 3, were most severely impacted by the recent drought. Most divisions reported that loss of reliable water supply as the most widespread severe impact (with Division 3 reporting the most widespread with six out of ten entities from all water user types reporting an impact). Division 5 had the least reported impacts with just 15% of the entities, on average, indicating a severe drought impact related to the top five identified impacts.

#### **Top Five Severe Drought Impacts**

- Loss of reliable water supply
- Loss of crop yield
- Loss of livestock
- Loss of system flexibility
- Fire damage