

Support Annex # 2

Hydrological Drought Plan

LEAD: Lewis County Division of Emergency Management (DEM)

SUPPORT: Lewis County Fire Districts
Lewis County Public Health & Social Services (LCPHSS)
Lewis County Public Works

I. INTRODUCTION

A. Purpose:

The purpose of this plan is to help coordinate countywide efforts in addressing hydrological drought conditions that affect private wells, Group A and B water systems and other sources of water people depend upon for potable and non-potable uses.

B. Scope

This plan pertains to private wells, Group A and B water systems and other sources of water people depend upon for potable and non-potable uses. It encourages and promotes educational efforts, water conservation and emergency preparedness for all residents of Lewis County to mitigate the effects of drought.

The plan encourages the collection, analysis and dissemination of information concerning drought conditions. It also promotes public conservation as the key to mitigate the effects of drought.

II. AUTHORITY & POLICY

- A.** State Department of Ecology - under RCW 43.83B RCW
- B.** State Department of Health
- C.** LCPHSS shall ensure the proper monitoring and testing of Group B water systems.
- D.** DEM shall guide the overall efforts to collect, analyze and distribute the information pertaining to drought conditions in Lewis County.

- E.** DEM shall coordinate with representatives from local governments, non-profit organizations, businesses, and volunteer entities to establish and maintain a hydrological drought plan.
- F.** DEM shall coordinate public education and media releases on drought-related issues.

III. SITUATION

a. Drought Conditions

The term drought does not have a single encompassing element that defines the condition. Drought can be described as both meteorological and hydrological in nature.

Washington State's legal definition of drought includes the following two conditions (The US Department of Agriculture and the National Weather Service use different rating scales.):

1. Water supply conditions where a geological area or significant part of a geological area is receiving, or is projected to receive, less than 75 percent of normal water supply as the result of natural conditions,

AND

2. The deficiency causes, or is projected to cause based on present and long-term meteorological projections, undue hardship to water users within that area.

b. Planning Assumptions

1. Wells can be stressed by drought conditions that create water shortages for users who rely on shallow wells (less than 100 feet), surface water, and/or springs as their water supply.
2. Wells can also be stressed by other conditions unrelated to drought.
3. Allocation of potable and non-potable water to an impacted community will adversely impact local resources.
4. Proper planning, education and conservation will mitigate the effects and potential effects from drought conditions.
5. Partners in the plan will promote water conservation and self-sufficiency in drought preparedness.
5. Potential resources exist for allocating non-potable water.

6. Municipality and large private water systems (not covered under this plan) have separate plans required by Washington State Department of Health that address water efficiency and shortage issues to their customers.
7. Drought conditions that cause water shortages can be associated with other widespread hazards such as fire. During emergency conditions resources are often severely limited both at the local and state levels.
9. When water table volume within a system is reduced, contaminants within that system are often magnified to levels that may cause a potential health risk.

IV. CONCEPT OF OPERATIONS

A. General

Lewis County addresses drought conditions and incidents through a network of both public and private partnerships to ensure the best possible outcome with the resources available. DEM takes the lead role in coordinating and facilitating the partnerships, preparation, community outreach and response to drought conditions and incidents.

B. Direction and Control

1. When DEM determines the situation warrants further action beyond information gathering, it will convene the Drought Committee (DC).
2. The DC meets to evaluate and make recommendation for response action to address the present and projected conditions.
3. DEM presents the DC recommendations to the Board of County Commissioners (BOCC).
4. The BOCC approves an appropriate course of action that may include issuing a proclamation and/or emergency/disaster declaration.
5. DEM assists the BOCC with issuing a proclamation and/or emergency/disaster declaration.
6. DEM administers the approved course of action through involved partners and issues media releases and alert notifications for increased public awareness.
7. Partner agencies carry out their specific objectives based upon their established operational response plans.

C. Information Collection and Dissemination

1. DEM collects, analyses and disseminates information gathered from a host of community sources to evaluate potential drought conditions. Sources include but are not limited to: Public Health, Public Works, water purveyors, media, business and individual sources.
2. When appropriate, DEM develops a drought information campaign to ensure a concise, coordinated approach to delivering the information to the public.

D. Hydrological Drought Plan Development and Maintenance

1. DEM is assigned the plan development and maintenance responsibilities.
2. DEM will work with the DC to make changes and additions to the plan as necessary.

E. Lewis County Drought Committee (DC)

The Lewis County Drought Committee (DC) is an ad hoc committee of technical advisors brought together by the Division of Emergency Management. DC has the purpose of providing information collection, analysis and dissemination on current well water conditions and recommendations to the public for water conservation.

The Lewis County Drought Committee (DC) meets at least once annually or monthly during times when it is anticipated there may be deficiency in precipitation over an extended period of time that could result in a water shortage. The DC will provide information to determine local conditions and provide for a unified message of resource conservation.

The Division of Emergency Management (DEM) will chair the meetings, solicit committee members, and provide secretarial support. It will take the lead in coordinating public information programs.

Representation on the Drought Committee (DC) will include at least one (1) representative from each of the following agencies:

- Emergency Management
- Public Health
- Fire services
- Public Works

Additional members, depending on conditions and availability, may be sought from the following disciplines, if deemed necessary and have an interest in serving on the committee:

- Community Development
- Law Enforcement
- Red Cross
- Salvation Army
- Media
- Well drillers
- Any other entities with an interest in water resources or usage

The DEM Deputy Director may establish additional categories of representation as the need arises.

V. RESPONSIBILITIES

A. Lead Role: DEM

1. Before Incident

Preparation

- a. Update and maintain the Hydrological Drought Support Annex # 2.
- b. Monitor local businesses, industry, and individuals to assess potential drought-related impacts.
- c. Track drought-related reports from federal, state and local sources.
- d. Gather information on potential local drought needs.

Mitigation

- a. Work with LCPHSS in determining the adequacy of local assistance in meeting emergency needs.
- b. Ensure all entities to the Hydrological Drought Support Annex # 2 are adequately informed and updated to changes in the plan.

2. During Incident

Response

- a. Monitor local businesses, industry, and individuals to assess the actual hydrological-related impacts.
- b. Track hydrological-related reports from federal, state, and local sources, including Washington State Department of Ecology water usage orders.

- c. If necessary, prepare and forward a proclamation, resolution or ordinance declaring a local emergency/disaster to BOCC for approval.
- d. Coordinate the state and FEMA preliminary damage assessment program with local jurisdictions.
- e. Provide information to the Public Information Officer (PIO) for release to the media and public

3. After Incident

Recovery

- a. Prepare resolution for BOCC approval to rescind the emergency or disaster declaration.
- b. Coordinate with LCPHSS to release a public notice that the hydrological drought conditions have subsided.
- c. Coordinate the final statistics for the preliminary damage assessment.
- d. Gather information from all government and non-government participants related to their activities during the emergency or disaster.
- e. Prepare status reports to the Drought Committee and other participants for their review and input.
- f. Prepare final After-Action Report / Improvement Plan and submit to BOCC.

B. Support Role: LCPHSS

1. Before Incident

Preparation

- a. Distribute water conservation materials for public water supply systems.
- b. Assist Group B water supply systems with determination of drought susceptibility, conservation efforts and technical questions.
- c. When necessary, develop a hydrological drought information letter to be distributed during water shortage periods that identifies the severity of the event.
- d. Monitor available well and water table data.

- e. Forward reports from citizens, businesses, water systems and LCPHSS employees concerning water issues to DEM.
- f. Compile a countywide water utility resource inventory.
- g. Attend hydrological drought planning meetings as appropriate.
- h. Form partnerships between government entities and community partners to develop related media releases.
- i. Notify DEM of any potential or occurring situations involving water shortage and/or conditions that may cause health concerns.

Mitigation

- a. Develop LCPHSS emergency response procedure to ensure consistent response by LCPHSS staff.

2. During Incident

Response

- a. Work to:
 - i. Provide information to Emergency Management
 - ii. Coordinate LCPHSS resources as requested
 - iii. Provide information to DEM & the Public Information Officer (PIO) for release to the media and public

3. After Incident

Recovery

- a. Participate in after-action debriefing
- b. Evaluate LCPHSS resources and internal plans for future drought events.
- c. Update all LCPHSS records and files concerning affected water resources and Group B water supply systems.

C. Support Role: Lewis County Public Works

1. Before Incident

Preparation

- a. Develop contingency plans for providing potable water for public consumption at county road shops
- b. Work with DEM and LCPHSS in monitoring and reporting water-related issues

2. During Incident**Response**

- a. Assist as available and necessary with providing potable water for human consumption to affected population

3. After Incident**Recovery**

- a. Provide appropriate reports to DEM for records and training purposes

D. Support Role: Fire Departments / Districts**1. Before Incident****Preparation**

- a. Develop contingency plans for providing non-potable water for public and animal use at each fire district station
- b. Work with DEM and LCPHSS in monitoring and reporting water related issues

2. During Incident**Response**

- a. Assist as available and necessary with providing non-potable water for public and animal use to affected population within the affected fire district

3. After Incident**Recovery**

- a. Provide appropriate reports to DEM for records and training purposes

VI. DEFINITIONS & ACRONYMS

DROUGHT	Drought can be described as both meteorological and hydrological in nature. Drought is a deficiency in precipitation over an extended period, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people. It is a normal, recurrent feature of climate that occurs in virtually all climate zones, from very wet to very dry. Drought is a temporary aberration from normal climatic conditions, thus it can vary significantly from one region to another. Unlike most states, Washington has a legal definition of drought. It requires that two conditions be met and it differs from the drought rating scale applied by the U.S. Department of Agriculture. The two conditions are: • An area has to be experiencing or projected to experience a water supply that is below 75 percent of normal, and • Water users within those areas will likely incur undue hardships as a result of the shortage.
DROUGHT COMMITTEE	Partners overseeing the Drought Plan and conservation messages to the public
EWEC	Executive Water Emergency Committee
WATER SYSTEMS – COMMUNITY	System that regularly serve 15 or more year-round residential connections, or 25 or more year-round residents (for 180 or more days/yr).
WATER SYSTEMS – GROUP A	Systems that regularly serves 15 or more residential connections or 25 or more people/day for 60 or more days/yr.
WATER SYSTEMS – GROUP B	Systems that serve less than 15 residential connections and less than 25 people/day or 25 or more people/day during fewer than 60 days/yr.
WATER SYSTEMS – NONCOMMUNITY	Any system that is not a community system.
WATER SYSTEMS - PUBLIC	All systems except those serving only one single-family residence or less than five residences on the same farm.
WRIA	Water Resource Inventory Area

Drought Monitor Classification Scheme

(United States Department of Agriculture – National Weather Service reporting scale for regional drought conditions)

D0	Abnormally Dry
D1	Drought – Moderate
D2	Drought – Severe
D3	Drought – Extreme
D4	Drought - Exceptional

Appendix A: Water Conservation Tips

Indoor Water Conservation Tips

General

- Never pour water down the drain when there may be another use for it. Use it to water your indoor plants or garden.
- Repair dripping faucets by replacing washers. One drop per second wastes 2,700 gallons of water per year!
- Check all plumbing for leaks. Have leaks repaired by a plumber.
- Install an instant hot water heater on your sink.
- Insulate your water pipes to reduce heat loss and prevent them from breaking.
- Install a water-softening system only when the minerals in the water would damage your pipes. Turn the softener off while on vacation.
- Choose appliances that are more energy and water efficient.

Bathroom

- Consider purchasing a low-volume toilet that uses less than half the water of older models. Note: In many areas, low-volume units are required by law.
- Install a toilet displacement device to cut down on the amount of water needed to flush. Place a one-gallon plastic jug of water into the tank to displace toilet flow (do not use a brick, it may dissolve and loose pieces may cause damage to the internal parts). Be sure installation does not interfere with the operating parts.
- Replace your showerhead with an ultra-low-flow version.
- Place a bucket in the shower to catch excess water for watering plants.
- Avoid flushing the toilet unnecessarily. Dispose of tissues, insects, and other similar waste in the trash rather than the toilet.
- Avoid taking baths—take short showers—turn on water only to get wet and lather and then again to rinse off.
- Avoid letting the water run while brushing your teeth, washing your face, or shaving.

Kitchen

- Operate automatic dishwashers only when they are fully loaded. Use the “light wash” feature, if available, to use less water.
- Hand wash dishes by filling two containers—one with soapy water and the other with rinse water containing a small amount of chlorine bleach.
- Clean vegetables in a pan filled with water rather than running water from the tap.
- Start a compost pile as an alternate method of disposing of food waste or simply dispose of food in the garbage. Kitchen sink disposals require a lot of water to operate properly).

- Store drinking water in the refrigerator. Do not let the tap run while you are waiting for water to cool.
- Avoid wasting water waiting for it to get hot. Capture it for other uses such as plant watering or heat it on the stove or in a microwave.
- Avoid rinsing dishes before placing them in the dishwasher; just remove large particles of food. (Most dishwashers can clean soiled dishes very well, so dishes do not have to be rinsed before washing).
- Avoid using running water to thaw meat or other frozen foods. Defrost food overnight in the refrigerator or use the defrost setting on your microwave oven.
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Laundry

- Operate automatic clothes washers only when they are fully loaded or set the water level for the size of your load.

Outdoor Water Conservation Tips

General

- Check your well pump periodically. If the automatic pump turns on and off while water is not being used, you have a leak.
- Plant native and/or drought-tolerant grasses, ground covers, shrubs, and trees. Once established, they do not need water as frequently and usually will survive a dry period without watering. Small plants require less water to become established. Group plants together based on similar water needs.
- Install irrigation devices that are the most water efficient for each use. Micro and drip irrigation and soaker hoses are examples of efficient devices.
- Use mulch to retain moisture in the soil. Mulch also helps control weeds that compete with landscape plants for water.
- Avoid purchasing recreational water toys that require a constant stream of water.
- Avoid installing ornamental water features (such as fountains) unless they use recycled water.

Car Washing

- Use a shut-off nozzle that can be adjusted down to a fine spray on your hose.
- Use a commercial car wash that recycles water. If you wash your own car, park on the grass so that you will be watering it at the same time.

Lawn Care

- Avoid over watering your lawn. A heavy rain eliminates the need for watering for up to two weeks. Most of the year, lawns only need one inch of water per week.

- Water in several short sessions rather than one long one, in order for your lawn to better absorb moisture.
- Position sprinklers so water lands on the lawn and shrubs and not on paved areas.
- Avoid sprinklers that spray a fine mist. Mist can evaporate before it reaches the lawn. Check sprinkler systems and timing devices regularly to be sure they operate properly.
- Raise the lawn mower blade to at least three inches or to its highest level. A higher cut encourages grass roots to grow deeper, shades the root system, and holds soil moisture.
- Plant drought-resistant lawn seed.
- Avoid over-fertilizing our lawn. Applying fertilizer increases the need for water. Apply fertilizers that contain slow-release, water-insoluble forms of nitrogen.
- Use a broom or blower instead of a hose to clean leaves and other debris from your driveway or sidewalk.
- Avoid leaving sprinklers or hoses unattended. A garden hose can pour out 600 gallons or more in only a few hours.

Appendix B:

Drought Conditions Contribute to Wildland Fires

The Pacific Northwest region is an area where fire has always played a prominent role in the natural environment. Long before towns and subdivisions were established across the landscape, fires were a natural result of the frequent summer thunderstorms that travelled across the mountains and plains. However, decades of fire suppression have resulted in fuel conditions that have the potential to create intense wildfires.

Within this natural fire environment, there are individual houses, subdivisions, and entire communities. Many homes, however, would be unable to survive an intense wildfire. Since it is not a question of “if” wildfires will occur but “when,” they will occur, the likelihood of human life and property loss is great and growing.

Our ability to live more safely in this fire environment greatly depends upon our use of “pre-fire activities.” Pre-fire activities are actions taken before a wildfire occurs which improve the survivability of people and homes. They include proper vegetation management around the home (known as defensible space), use of fire resistant building materials, appropriate subdivision design, and other measures. Research clearly demonstrates that pre-fire activities save lives and property. (Additional defensible space information is available at local fire district departments.)

Firefighters recognize three components of the fire environment: weather, topography and fuel. These components affect the likelihood of a fire starting, the speed and direction at which a wildfire will travel, the intensity at which a wildfire burns and the ability to control and extinguish a wildfire. Although weather and topography cannot be changed, the fuels (or vegetation) can be modified. Consequently, many of our opportunities to reduce the wildfire threat lie in proper management and manipulation of wildland vegetation.

Weather:

Dry, hot and windy weather increases the likelihood of a major wildfire. These conditions make ignition easier, allow fuels to burn more rapidly and increase the intensity. High wind speeds, in particular, can transform a small, easily controllable fire into a catastrophic event in a matter of minutes.

Drought:

Drought is a condition of climatic dryness that is severe enough to reduce soil moisture, water and snow levels below the minimum necessary for sustaining plant, animal, and economic systems.

Drought is a normal, recurrent feature of climate. It is not a rare and random event. It occurs in virtually all the world’s climatic zones. However, the drought characteristics vary significantly from one region to another. Drought is a temporary aberration (particularly in the Pacific Northwest) and differs from “aridity” since the latter is restricted to low rainfall regions and is a permanent feature of climate.

A statutory criteria for a drought includes the following:

- Water supply below 75 percent of normal
- Shortage expected to create undue hardship for some water users

There are four different way that drought can be defined: Meteorological, Agricultural, Hydrological, and Socioeconomic.

Drought Severity Classification			
<i>Category</i>	<i>Description</i>	<i>% of Normal Precipitation.</i>	<i>Possible Impacts</i>
D0	Abnormally Dry	<75% for 3 months	Short-term dryness slowing planting, growth of crops or pastures; fire risk above average.
D1	Moderate Drought	<70% for 3 months	Damage to crops, pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent.
D2	Severe Drought	<65% for 6 months	Crop or pasture losses likely; fire risk very high; water shortages common
D3	Extreme Drought	<60% for 6 months	Major crop/pasture losses; extreme fire danger; widespread water shortages.
D4	Exceptional Drought	<65% for 12 months	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies.

Ground Water and Wells:

In Washington much of the drinking water comes from the ground. Reduced precipitation during a drought means that ground water supplies are not being replenished at a normal rate. This can lead to a reduction in ground water levels and problems such as reduced pumping capacity or worse yet – wells going dry. Shallow wells are more vulnerable than deep wells. In Lewis County, the total population serviced by a public water supply is 37,172 (54%); private wells service a population of 31,828 (46%).

Most water utilities are aware of this problem and continuously monitor ground water levels, implementing water conservation measures as necessary. For private homeowner wells, the Washington State Department of Health, Division of Drinking Water Quality, advises water conservation practices.

Lewis County Drought History:

In spite of the marine climate of Western Washington, Lewis County has experienced drought periodically for at least the last 100 years. The entire county has the potential for future droughts. Washington State usually experiences drought during a regional climate event, i.e. as part of a much larger region affected by dry conditions. Some of the major droughts that have affected Lewis County are briefly described below:

Date	Event Description
1922 (June – August)	Crop production was below average. There were a number of forest fires. The first Governor’s proclamation prohibiting campfires in the forests was issued.
1934 (April 1934 – March)	The longest drought in the region’s history. The Legislature declared fire season to be from April 15 to October 15.
1938 (May – September)	It was the driest growing season ever recorded with less than half the normal amount of precipitation. The fire season was the most hazardous since 1922.
1952	Extremely dry year with precipitation below normal in every month except June.
1964 (January – May)	Dry with considerable wind and blowing dust.
1967 (June – August)	State and National forests were closed, prohibiting logging, mining and recreation.
1976-77 (October 1976 – September 1977)	Stream flows averaged between 30 to 70 percent of normal.
2000-01 (October - August)	The 2000-01 season was one of the five driest in the past 100 years. Rainfall was approximately 30% below normal. Federal agencies provided more than \$10.1 million in disaster aid to growers.
2005 (March – December)	Water supply forecast was 66 percent of normal with a project of \$300 million drought impact. Governor Christine Gregorie request an agricultural disaster designation for crop damage in 15 counties. Unanticipated late spring precipitation lessened the impacts and reservoirs filled to 95 of capacity in most areas.
January 7, 2014 and ending March 22, 2016	The entire Pacific Northwest experienced varying degrees of water shortages in 2015. April 2015, the snowpack measured only 25% of normal statewide. Municipal agencies and private wells experienced a declining water table as the summer months proceeded. Executives received a grant to monitor the water tables monthly as some private homes experienced dry wells. In June, the Governor proclaimed a state of emergency and small business loans were made available to small farmers. By the end of July 9, 2015, farmers with “junior” water rights were ordered to stop taking water from the local rivers due to fish run concerns. By August 25, 2015, 84.64 % of Washington was in a D3 drought condition.

2018	By the end of winter, the snowpack was exactly where it needed to be to provide plenty of water to rivers and streams. However, a warmer than normal May depleted that source and Western Washington communities were in a D1 (moderate) drought pattern by August, 2018. Lack of spring-summer precipitation increased the fire severity. During 2018, the annual rainfall in Centralia, WA was 19.58”, 41.6% of normal (47.03” per year). The unseasonably dry Western Washington conditions resulted in 45% of the 2018 state wildfires occurred in Western Washington (up from a normal of about 15%). On Sept 26, 2018, US Sec of Agriculture designated an agriculture disaster (SBA 15736-01WA) for businesses depending on farmers and ranchers (deadline to apply was May 28, 2018).
2019	March, 2019 was the second driest March since records began being kept. Snowpack in Washington tends to peak around early April. By April 1, the snowpack was about 80 % of normal, causing Governor Inslee to declare three watershed areas in Eastern Washington for drought emergency. The last two weeks in March, Riverside Fire Authority had responded to 8 wildfires over one acre in size, an all-time record. (For comparison, the Lewis County fire season doesn’t usually start until July.) Governor Jay Inslee declared a drought emergency on April 4, 2019 for three eastern watersheds. By May, 24 additional watersheds were added to the emergency declaration. In May, a warming trend melted the remaining snow in the mountains, leaving 71% of Washington State’s population in drought-affected areas. By July, the U. S. Drought Monitor expanded Abnormally Dry conditions from 78 percent to 86 percent while keeping Moderate Drought and worse at 55 percent for Washington State. The 2019 Washington State drought was the third driest on record since drought records began. Small Business Administration loans were made available to residents and businesses affected by the drought through April, 2020.
2020	In 2020, while most of the State received normal to above normal precipitation, reduced rainfall and drought conditions in Central Washington persisted. Flows in the Yakima river were down 30-40%, contributing to the US Secretary of Agriculture designation of an agricultural disaster, including Yakima on June 11, 2020. Lewis County was included as a neighboring county. The drought disaster began April 1, 2020 and provides SBA loans to Lewis County impacted small businesses until February 11, 2021.

In order to define Lewis County's vulnerability to a severe drought, it is important to examine the effects of prolonged dry weather on the four separate impact areas of droughts.

1. **Meteorological Impact** - Probably the most significant vulnerability in Lewis County from a prolonged period of dry weather is the elevation of the wild land fire threat in the Cascade foothills and western slopes. Warm, dry weather often exacerbates late afternoon thunderstorm-induced lightning, the most relevant cause of wild fire in Western Washington.
2. **Agricultural Impact** – The vulnerability of Lewis County agriculture to drought is dependent upon the variable susceptibility of crops during the different stages of crop development. Deficient topsoil moisture at planting may hinder germination, leading to low plant populations per hectare and reduction of final yield. However, if the topsoil moisture is sufficient for early growth requirements, deficiencies in subsoil moisture at this early stage may not affect final yield should subsoil moisture be replenished as the growing season progresses or if rainfall (or irrigation) can meet plant water needs.

A significant part of Lewis County's remaining agricultural industry involves dairy herds, beef cattle, poultry, and other animal husbandry. Livestock drought concerns relate primarily to large animal needs for substantial quantities of drinking-quality water daily – 15-20 GPD for horses and up to 50 GPD for dairy cattle.

3. **Hydrological Impact** – water in Lewis County's hydrologic storage system (e.g., lakes reservoirs, and drivers) is often used for multiple and competing purposes (e.g., flood control, irrigation, recreation, navigation, hydropower, wildlife habitat), further complicating the sequence and quantification of effects. Competition for water in these storage systems escalates during drought and conflicts between water users may increase significantly.
4. **Socioeconomic** – Lewis County is likely to feel few direct effects from an agricultural drought, although the ripple effect could cause some economic hardships.

EFFECTS:

Drought affects water levels for use by industry, agriculture, and individual consumers. It also affects power production from hydroelectric dams. Water shortages affect firefighting capabilities through reduced flows and pressures. Other affects may include:

- Loss of agricultural products
- Forest fires and the resulting erosion that causes damage to aquatic life, irrigation, and power generation through the silting streams, reservoirs and rivers
- Loss of jobs in agricultural and forestry related industries
- The loss of fish, their spawning beds and the related fisheries
- Possible salt-water intrusion into the water table along Puget Sound, affecting local wells

In addition, drought has forced the closure of ski resorts and limited the use of other recreational facilities such as the wilderness areas for hiking, camping, boating, and recreational fishing.

MITIGATION:

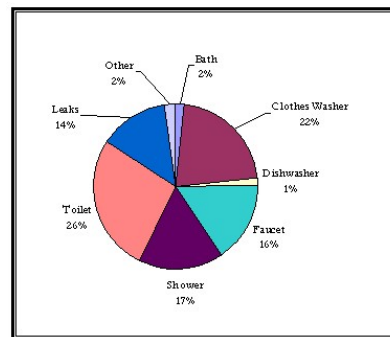
Drought mitigation can take many short-term forms including, but not limited to:

- Implementing energy and water conservation programs aimed at convincing the public to use less electricity and water
- Increasing energy efficiency for homes and other buildings
- Creating new pipelines to tap into unutilized watersheds
- Developing stricter irrigation methods such as drip irrigation

WATER CONSERVATION

Residents need to do their part to lessen the effects of limited water supplies during summer months. They can start by conserving water use today. Landscape watering and toilets use the largest amount of water in the home

Typical Water Usage



Mitigation recommendations for homeowners:

- Repair pipe and faucet leaks promptly
- Converting to low water landscaping
- Selecting plants, shrubs, and trees that need minimal water
- Water lawns early in the morning and/or late in the evening
- Limit water use to approximately one inch per week, including rainfall.
- Encourage growth of a deep root structure that is more drought resistant by watering less frequently
- Consider not watering the lawn for the summer months
- Convert to water efficient toilets (1.6 gallons per flush), faucets and showerheads (2.5 gallons per minute)
- Take shorter showers
- Conserve water by not letting the faucet run when shaving, brushing teeth, or hand washing dishes
- Use faucets at less than full pressure
- Operate washing machines or dishwashers at full capacity loads

Technical assistance during a current drought emergency is focused on water systems most vulnerable to drought impact. Washington State Department of Health sponsored activities include:

- Educating system operators about water conservation
- Promoting water audits and leak detection
- Supporting the development of water shortage response plans
- Helping identify alternate water sources
- Helping develop drought ordinances
- Ensuring the safe use of emergency sources of water