

APPENDIX F

BACKGROUND INFORMATION PREPARED BY THE OBJECTIVES WORK GROUP WHICH SUPPORTS DEVELOPMENT OF THE CABY OBJECTIVES

The following text was developed directly by the Objectives Work Group during their work of identifying the CABY objectives and measurable outcomes.

1. Programmatic Area: Water Supply

- The issue of water supply is important to the region because:
 - Sharing resources/amenities – including knowledge, available water resources, and financial resources – is part of how needs will be addressed in the future
 - Water resources are disproportionately available within the CABY Region, with some ability to transfer those resources across the region
 - A consistent and reliable water supply is a strong driver of the regional economy, including water for agriculture, recreation, and municipal uses
- CABY will address this issue through:
 - A holistic approach to water management, including looking at the issue for consumptive and non-consumptive use in an environmentally responsible way: water “supply” for municipal, agricultural, and industrial uses, and water “quantity” for a healthy environment
 - Providing opportunities for areas lacking adequate water resources to develop and manage local supplies to meet the needs of their citizens
 - Encouraging joint and conjunctive uses of water within the CABY Region and with neighboring IRWMP regions to maximize beneficial uses in the region

1.1. Primary Issue: Conservation

- Water conservation is an effective way for consumers to save money and for purveyors to stretch supply
- System leakage can be extremely high in rural systems with greater infrastructure-to-customer ratios
- The larger purveyors in the region have existing water conservation programs, and several also offer agricultural water conservation programs
 - When El Dorado Irrigation District’s Irrigation Management Service (IMS) program was evaluated in 1986 after the program had been running approximately 7 years, the results showed that agricultural water use conservation was over 2,000 acre-feet annually (when measured against pre-program levels)¹

¹ El Dorado Irrigation District, 2008. [Final Program Report: Scheduling irrigation for commercial agricultural growers within the El Dorado Irrigation District using permanently placed soil moisture sensors](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044941.pdf). Placerville, CA. Available at: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044941.pdf.

- Small districts often have fewer options with regard to additional water supplies, and can benefit greatly from customers practicing conservation
- Help agencies to preserve their water supply for system resiliency/reliability and future demands, while preserving regional instream flows

1.2. Primary Issue: Infrastructure

1.2.1. Aging Infrastructure

- Water delivery infrastructure can be as old as the legacy gold mining activity in the region (from the late 1800s); as a result, much of CABY Region water delivery infrastructure is old and/or failing
- Sierra systems have a higher ratio of water delivery infrastructure-to-retail connections than more urbanized areas, leading to higher per-capita costs for consumers
 - The higher ratio of infrastructure means that fewer customers bear greater cost; this is often the case in disadvantaged communities throughout the region
- System leakage can also be extremely high in rural systems with greater infrastructure-to-customer ratios, which can affect drinking water quality through intrusions into potable water piping
- Small districts often have fewer options with regard to additional water supplies, and can benefit greatly from practicing supply-side (system) conservation; this usually includes upgrading to more efficient infrastructure
- Diversion points are a special component of this issue: diversions are now done somewhat differently from how they were done in the past, doing less environmental harm but requiring upgrades
 - There are opportunities to improve *and repair* diversion structures throughout the region

1.2.2. Interties

- CABY stakeholders have identified interties as: a legal and physical connection within and/or between systems
- Water systems throughout the CABY Region are at risk for catastrophic failure from a variety of causes: fire, flooding and mass slumping, and even simple spontaneous failure due to long-term stress
 - Because of the remote nature of water delivery systems in the CABY Region, catastrophic failures can be difficult to reach with repair equipment
 - This sometimes indicates a longer lag-time in repairing catastrophic failures, and can also complicate regular repair efforts
- In addition to unplanned catastrophes, water managers may schedule maintenance events where an alternate source is essential: interties assist necessary maintenance of purveyor systems
 - Interties within a system as well as between systems can help to provide the redundancies needed for the provision of backup supply directly to customers and/or to water treatment plants
 - Redundancies between systems can provide a mechanism to convey water for environmental purposes (streamflow)

- Interties between agency systems are also a way to ensure a more reliable supply for CABY purveyors

1.3. Primary Issue: Water Storage

- Regional interest in water storage varies amongst those stating that storage is an essential way to meet future water demands (municipal, agricultural, and environmental) and member groups who oppose additional storage until a certain level of conservation and alternate supply augmentation methods can be implemented
- The current storage system in the region is an essential tool in providing urban, agricultural, industrial, and environmental water of the appropriate amount and temperature throughout California's dry season, as well as an important flood control tool in the rainy season
- Purveyors in the region generally have adequate storage for existing needs, but may determine that future needs necessitate the consideration of additional storage
 - Smaller agencies and isolated systems may have immediate storage deficiencies
- CABY stakeholders want to be included in the early stages of new storage project development: this represents an opportunity on the part of the project proponent to get early conceptual input
- CABY stakeholders generally have a pragmatic approach to the issue: the most cost effective, least environmentally damaging option that meets multiple water supply needs is usually the best
- At least one water agency in the region is interested in determining the feasibility of additional new storage facilities; CABY stakeholders identify that this must accomplish multiple benefits (including environmental, recreational, and water quality benefits)
- While there may not be much opposition to modifications, such as dam raises (note PCWA's recent experience with Hell Hole), new on-stream storage would likely face significant opposition as-is
- Water banking and conjunctive use could be viable alternate water supply management opportunities for purveyors within the CABY Region
 - Wet year surplus could be stored in valley floor groundwater basins, creating an interregional partnership
- The significant forest lands in the CABY Region represent a resource that can be managed for water supply and storage; a programmatic approach to protecting CABY's headwaters is essential to the water supply and quality status of purveyors in the region and throughout the state

1.4. Primary Issue: Water Management Operations

1.4.1. Drought

- Drought cannot be avoided, especially as climate change begins to alter California's hydrology
- As climate change increases the likelihood of more extreme weather events, drought planning becomes more important
- Drought preparedness is important in a region dependent largely upon snowpack
- The term "drought" can also apply to situations where supply has been curtailed by a catastrophic failure, by planned maintenance, or for regulatory reasons

- Whatever the cause, it's important for all purveyors, whatever the size, to have management plans in place for water shortage situations
 - These must go beyond identifying stages to identifying the actions a purveyor must take, and by what department
- Many purveyors have significant flexibility in adapting to drought conditions through customer response; however, traditional drought response (including staged customer conservation) will become less effective over time due to demand hardening, as purveyors endeavor to comply with 20% (conservation) by 2020 targets
- Stakeholders have also conceptually identified a regional drought response as a desirable management strategy to consider in the future
 - Regional drought response would likely include: 1) the use of interties and shared storage locations to transfer water between CABY members, 2) sharing messaging strategies and printed materials, and 3) sharing equipment, such as water delivery trucks, to meet regional needs
 - This will be pursued by the CABY Water Work Group

1.4.2. Recycled Water

- Regional recycled water systems are already in use in some parts of the CABY Region
- This infrastructure is expensive, but can be paid for by new development fees and is a relatively drought-proof source (though supply can shrink as potable water use decreases)
- Stakeholder in the region are interested in the development of additional recycled water infrastructure to serve new urbanization and agricultural demands
 - This represents increased flexibility in supply development, and regional self-sufficiency
 - It can also save resources over time: both financial and natural
- There are regulatory and legal considerations in which CABY stakeholders have exhibited an interest
 - Being advocates for the streamlining of regulations for permitting recycled water projects
 - Pursuing the process of identifying locations where the sales of effluent may occur between producer and downstream users
- Where regional wastewater systems aren't available, it may be appropriate to facilitate the use of onsite gray water systems
 - Use of on-site recycled water systems (gray water) is not prevalent within the region, and local governments often lack policies and procedures to allow homeowners to install systems
 - Gray water systems need to be easy for the user, and less costly than the next alternative
 - Septic systems are efficient water recycling infrastructure, though regional sewer has a larger potential for overall recycled water – this could help purveyors to meet 20x2020 targets
 - Stakeholders will consider identifying functional and acceptable gray water system protocols for CABY Region homes that could be adopted by the many permitting entities in the region

1.5. Primary Issue: Water Transfers

- Water transfers can be completed both within the CABY Region and with outside organizations – these two possibilities represent very different ways of managing water and elicit very different responses from a variety of stakeholders
 - CABY stakeholders acknowledge that transfers will occur in the future, and want to be diligent as to how that happens and make intelligent decisions that benefit the region
- CABY stakeholders are interested in developing a consensus position regarding water transfers from the CABY region to outside entities
- Both financial and water resources are affected by this issue
 - There is a significant economic incentive to conserve water; this preserves it for sales/transfers
- Environmental transfers are a consideration under this issue, as well
- Stakeholder viewpoints are all over the map when it comes to discussions surrounding water policy questions of transfers, sales, Delta question, Area of Origin, diversion points and other issues – not from a point of disagreement or values, but because many participants don't approach the issue from a strategic perspective and aren't fully informed on the issue
 - There needs to be a shared stakeholder understanding regarding outside (State and federal) political threats to the region and the shared values held by CABY stakeholders for preserving in-region supply and self sufficiency
- Water carries a spiritual value for many Native American tribes' religious traditions
 - For some tribes, spiritual values associated with water resources prevent tribes from endorsing water transfers due to the tribal ethic against mixing two or more waters
 - This is sometimes due to historic tribal boundaries and the protocol associated with inter-tribal relations, and could also be due to biological reasons such as salmon "smelling" their home waters
 - CABY will attempt to honor these beliefs while maintaining expected levels of delivery and quality throughout the region by including Native American participants in the discussion

1.6. Primary Issue: Groundwater

- Groundwater resources in the CABY Region, while present in many areas, are extremely limited
- Much is unknown about groundwater resources within the region due largely to the fact that the underground geology is made up of unpredictable fractured rock systems
 - This also creates an unknown condition with water quality and contamination – because the system isn't known it would be difficult to identify the source of contamination were a well to become contaminated
- Historically, subdivisions that have been proposed in areas where municipal water delivery would have been impossible were allowed to create a groundwater system for residential water use

- These systems are unreliable in many cases, and may dry up during periods of drought
- Additional ground-water dependent development in areas adjacent to existing ground-water dependent development can cause significant impacts to the already developed area, making the resource less reliable
- Through greater “flashiness” in the hydrograph, climate change could potentially create a higher occurrence of drought
 - This could create a management challenge in the region regarding residences and small communities dependent upon groundwater resources which are intermittently or permanently not available
- Small developments dependent upon groundwater continue to be proposed, and it is in the interest of the region’s planning entities and water purveyors to minimize developments that may incur significant impacts by being completely dependent upon groundwater resources (including severe long term shortages, drying wells, and becoming dependent upon trucked-in water)

2. Programmatic Area: Water Quality

- The issue of water quality is important to the region because:
 - There are major legacy issues affecting water quality and human and environmental health within the CABY Region
 - The CABY Region contains significant headwaters area important to the provision of clean, cool water for the region and for the state as a whole
 - In addition to legacy threats, current uses can sometimes endanger regional water quality, including non-system recreation activities and wastewater treatment (small- and large-scale)
- CABY will address this issue through:
 - Encouraging the use of proactive, “green” storm water management and low impact design; these are important development issues that can positively affect water quality at a relatively low additional cost
 - Education and outreach done through school, community, and organizational promotion efforts
- These issues won’t be solved overnight, but they require partnerships and the synergies of collaborative planning and management

2.1. Primary Issue: Contamination

2.1.1. Legacy Mining Toxins

- Legacy mining toxins are a hazard to subsistence fishing communities as well as those communities whose drinking water is affected
- CABY stakeholders have made it a priority to map all abandoned mines and then prioritize identified mines for remediation
 - As resources become available, remediation should begin on a number of mines annually
- Legacy contaminants are of great concern within the CABY Region, affecting activities such as:
 - The availability of potable, healthy drinking water,

- The use of native materials for cultural activities, including basket making and spiritual ceremonies,
- Subsistence fishing, and
- The overall health of the riparian environment and species depending on clean water for survival and propagation
- These legacy contaminants flow into the Central Valley and through the Delta, compounding the state’s mercury challenge
- In the Combie Reservoir alone it is estimated that there are 150 pounds of mercury lodged in the sediments at the base of the dam
- Innovation is encouraged - contaminants may be removed through any means possible that maintain the integrity of the environment
- Stakeholders want to make every effort to identify all toxins taken out of the river – even by non-regulatory (private) processes

2.1.2. Urban Run-off and Abandoned Mine Land Run-off

- There are a variety of sources of water contamination in the region, and the CABY Region hosts 14 303(d) listed water bodies, listed for exotic species, mercury, bacteria, fecal coliform, pH, copper, sediment/siltation, zinc, and arsenic
- Contamination affects the health of aquatic species and recreational activities in the region
- Achieving water quality objectives for beneficial use will improve the quality of life for people throughout the region
- Because it is difficult to quantify the effect of a remediation project on a specific water body’s level of contamination, the number of projects implemented is the gauge of success rather than the units of contamination remediated
- River systems are the focus due to their importance to native species and their role as providing refugia throughout the CABY Region

2.2. Primary Issue: Sedimentation Management

- Sediment transport is a natural and necessary function of river systems
- Most rivers in the region have had their natural sediment regimes significantly altered by land use practices, roads and dams
 - This includes both erosion beyond natural levels, as well as sediment trapping behind structures
- In disturbed landscapes, such as urban areas, rural areas altered by commercial development, and roaded areas, changes in the sediment regime can result in alteration of natural material, including the cementing of gravel bars and beaches, introductions of toxins into streambeds and riparian habitats, and nutrient loading of waterways resulting in algal blooms and low oxygen levels in streams and lakes
 - This can negatively affect water quality for the environment as well as for municipal use
- In rivers where dams have altered hydrologic regimes and/or prevent the downstream travel of heavier sediments and woody debris there can be a loss of spawning gravels, beaches, gravel bars, and floodplain soils, resulting in significant alteration and loss of riparian habitat, lands and channel function

- There are a variety of projects and approaches that are occurring to address these issues, including habitat restoration projects, road design improvements and removal, and changes in reservoir and hydro-system management as a result of cost analysis, relicensing requirements, and better understanding of ecosystem needs

2.3. Primary Issue: Wastewater Management

- Infrastructure condition and capacity, due to age and occasionally to the speed of regional population growth, is a challenge throughout the CABY Region; this includes both septic systems and wastewater treatment plants
- In some cases, new development has fueled the upgrade of wastewater infrastructure including, in El Dorado County, the funding for the development and continued operation of a recycled water system replacing about 8% of total deliveries
- In localized cases, poorly managed septic systems and non-system recreational uses can result in water body and drinking water contamination
 - This is not well-understood across the region and requires additional research and conversation
- Wastewater management is a challenge throughout rural mountainous counties, and the CABY stakeholders are interested in furthering a regional understanding of the issue in order to, in the future, create concrete, quantifiable objectives for addressing spills, leakage, and management

2.4. Primary Issue: Headwaters Protection

- Healthy headwaters are essential to preserve the freshwater resources of the CABY region and are an important piece in the continuous provision of cool, clear water to downstream users
- Healthy headwater streams are major sources of water and dissolved and suspended organic and inorganic constituents for the downstream ecosystems into which they flow
- The health of headwater streams is dependent upon land use practices and the condition of the watershed
- Source water areas providing most of the water throughout the western US are under threat from climate change
 - Headwaters provide a “reservoir capacity” that can increase the flexibility of water providers in dealing with fewer resources overall
- As the CABY Region population grows, the demand for water and other natural resources will increase – healthy headwaters are an integral part of providing for those future needs

2.5. Primary Issue: Temperature

- Appropriate water temperature is essential for the maintenance and continuity of native aquatic species as well as for economic and industrial purposes and uses
- Stream systems represent important temperature refugia for aquatic species in the face of climate change
- CABY Region lakes, reservoirs, and streams represent a cold water pool for lower streams and rivers (including Western Placer Creeks and Folsom Reservoir)

- Stream restoration efforts will include re-vegetation efforts and will emphasize shading, where appropriate, to preserve stream temperatures even as climate change projections include increased air temperature

3. Programmatic Area: Environment and Habitat

- Environment and habitat issues are important to the region because:
 - Stakeholders recognize humans as part of the natural system and part of CABY watersheds
 - There are a number of endemic and threatened and endangered species and habitats in the region
 - California's Sierra Nevada is an important ecological unit due to the diversity and number of endemic species found here
- CABY will address these issues through:
 - Comprehensive implementation project planning, including inter-watershed considerations (north-south) and headwaters-boundary planning (east-west); planning on a watershed level
 - The encouragement of healthy and sustainable economic prosperity while preserving the natural environment for a diversity of uses now and into the future
 - Innovative partnerships and funding mechanisms to maintain – and even improve – the current level of effort into the future

3.1. Primary Issue: Fisheries

3.1.1. Fish Passage

- There are significant physical barriers in (and just outside of) the CABY Region to anadromous and Sierra endemic fish species preventing them from reaching historic habitat and spawning areas
- There are some possibilities within the region to improve access to historic habitat, including Western Placer Creeks, the Cosumnes River, and the Yuba River
- Improved access would also necessitate the provision of suitable habitat: vegetated riparian corridors, adequate flow to maintain spawning and rearing habitat and temperatures, substrate materials suitable to use, and the absence of harmful contaminants at intolerable levels
- Habitat suitable for anadromous and/or fish will also usually be suitable for other aquatic biota
- Because of limited accessibility by anadromous fish to historic habitat up and down California's Central Valley (in the Sierra, Cascades, and in the Coastal Ranges), the potential for habitat in the CABY Region achieves even greater significance
- Stakeholders have exhibited one caveat to expanding habitat, and that is that this expansion may allow for greater mobility by aquatic invasive species
 - This will continue to be a consideration and a discussion for implementation projects addressing this objective

3.2. Primary Issue: Aquatic Biota

- Aquatic biota are dependent upon many of the other considerations and issues addressed in this section
- Instream flow, meadows restoration, and headwaters protection will help to preserve cooler temperatures, maintain summer base flow, minimize problems coming from contamination, and provide for a diverse habitat for the many species hosted by streams and rivers in the region
- The challenge of preserving the health of aquatic biota is compounded by the presence of invasive species
- Opening up streams for additional anadromous fish passage will help in the healthy and natural transport of sediment through the system and allow for navigation of larger lengths of streams and rivers by other species

3.3. Primary Issue: Instream Flow

- Adequate instream flow is essential for maintaining cool temperatures and for a healthy movement of sediment and nutrients in the system
 - Flow can help in diluting contaminants, including sediment, chemicals, and urban run-off
- Additional instream flow could contribute to enhanced anadromy within the region and in-region migration
- A minimum level of instream flow is required for boating and environmental benefits on regional rivers; this is largely controlled by FERC licenses
- The CABY Water Trust may play a role in the preservation of instream flows not already controlled by FERC licenses.
- Preserving instream flow will give waterways and water purveyors additional flexibility in the face of a changing climate
 - Healthy streams means that greater flexibility in diversions and/or transfers may be appropriate
 - Adequate flow and maintained temperature mean that additional environmental flows may not be necessary to maintain negotiated temperature standards

3.4. Primary Issue: Meadows

- Meadows are essential habitat for plants and animals alike
 - Wet meadows (as opposed to dry meadows) are the focus of this objective because of their positive effects on water resources and importance for aquatic habitat
 - Functioning meadows can preserve cool water temperatures and can maintain summer base flow – they act like a reservoir
- There are several organizations working on meadow restoration within the CABY stakeholder group
- While CABY doesn't have the large-scale meadow complexes present in other IRWM regions, regional resources do remain important to preserving base flow and temperature throughout the summer and fall
- Historic grazing practices often degraded the meadows; these historic impacts continue to have environmental consequences (such as increased erosion and reduced water

quality), though current management avoids these issues through the employment of best management practices

- Climate change may alter the species that make up vegetation bands in which CABY meadow areas are located – this could infringe on meadow habitat through the growth of perennial shrub species in meadow areas formerly dominated by herbaceous species.

3.5. Primary Issue: Fire and Fuels

- The CABY Region is at extreme risk of the occurrence of catastrophic wildfires
 - Mid-20th-century prevention of forest fires
 - High wildland-urban-interface population, so high economic risk, which complicates firefighting along that boundary, and increases the cost exponentially
- Catastrophic fire severely harms both human infrastructure (homes, utility lines, transportation routes) as well as high-quality habitat and diverse ecosystems
- Resource Conservation Districts throughout the planning area work with private landowners to implement best management practices to minimize fire risk on properties
- Catastrophic wildfire can create conditions in the forest that exacerbate habitat degradation and loss, including mass slumping, loss of sediment, and hydrophobic soil conditions
- The science of catastrophic fire prevention is well-understood, but the effort and expense essential to carry out these activities is beyond many organizations' capacity
 - Fuels management is expensive because of the equipment and labor necessary to do a good job
 - Research shows that a little bit of prevention in the form of fuels control can go a long way
 - 10,000 acres is just under 0.4% of the entire CABY Region, but could make a difference to the humans and animals spared in a catastrophic wildfire
- As climate change effects are felt, it's likely that the CABY Region will experience greater impacts from catastrophic fire due to warmer overall temperatures and either less overall precipitation or precipitation coming in more extreme events
- This is an objective that could benefit from a potential federal and/or statewide source water investment program
- CABY stakeholders have evaluated this issue as being so important that they decided it would be the focus for the initial climate change analysis (see Chapter 11, Climate Change)

3.6. Primary Issue: Invasive Species

3.6.1. Aquatic Invasive Species

- Aquatic invasive species (AIS) are a problem throughout the state; many were brought here through intercontinental oceanic vessels
- The key to avoiding their spread is the prevention of cross contamination by users, including boaters and fishermen
 - Public education is a key component of this issue

- The variety of land management agencies throughout the planning area can make management of infestations difficult – a regional plan of action is essential to successful control of AIS
- Communication between management agencies will enable managers to more quickly respond to potential infestations, closing the infested area and checking potential contamination vehicles at water bodies throughout the region

3.6.2. Terrestrial Invasive Species

- Terrestrial invasive species are ubiquitous throughout the planning region; CABY stakeholders have chosen to focus on plants because of their direct connection to water
- Terrestrial invasive species can:
 - Shade-out and/or outcompete native species
 - Completely change a habitat type and the cycles of growth and senescence, which in turn can affect the species composition present at any given location and affect fire behavior on that location
 - Change the amount of runoff reaching a stream or other water body
- Seeds of these invasives can be spread by animals (domestic and wild), human activity, vehicles, and even the wind
- Education is key for several reasons: 1) to help in the identification of invasive species, 2) to prevent the spread by controllable mechanisms, and 3) to ensure that invasive species are not available commercially
- It is in the interest of all stakeholders to discourage the introduction and spread of invasive species; the survey and control work is often done by volunteer groups, and can be combined with fire/fuels control activities

4. Programmatic Area: Climate Change

- The issue of climate change is important to the region because:
 - Climate change has the potential to affect all components of resource management
 - The CABY Region is at the convergence of two areas of climate change projections: the northern Sierra/Cascade and the southern Sierra, which complicates projecting the effects of climate change on the planning area
 - The region has already begun to experience some of what could be the effects of climate change, including drier winters, earlier spring melts, and warmer average temperatures
 - Some of the greatest vulnerabilities include the rich biodiversity present in the Sierra
- CABY will address this issue through:
 - Addressing the issue through the most practical, cost-effective, and accurate methods possible; stakeholders have assumed that one, or a combination, of four scenarios could play out in the region: warmer-wetter; warmer-drier; cooler-wetter; and/or cooler-drier
 - Stakeholders have identified that, while it's unknown how climate change will affect the region, it's probable that increased flexibility will be an important – even essential – tool in meeting that challenge

- CABY’s approach to climate change will include analysis of both human needs (water resources, economic effects) and environmental needs (instream flow, water temperature, and habitat corridors)
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- Stakeholders are interested in identifying achievable strategies for dealing with the projected effects of climate change
- The CABY Climate Change effort
- CABY stakeholders have decided to focus on the climate effects on fire occurrence and severity and fuels management (see Chapter 11, Climate Change) for several reasons:
 - Fire is connected to many other issues, including habitat connectivity, species migration, and land use decisions – all of which will also be affected by climate change
 - Climate change effects are usually projected with a range of (sometimes conflicting) outcomes; because fire is already an issue within the CABY Region, stakeholders can feel confident that the vulnerabilities they identify and mitigation measures they select will not be “wasted effort”, no matter what projection and outcome occurs
 - There is a lot of information on fire and fuels and how they’re affected by climate change, which makes analysis feel more comprehensive and less like a “guessing game”
- After identifying vulnerabilities, the CABY Climate Change TAC will identify adaptation strategies to cope with these vulnerabilities
- These are expected to be cost-effective and easily implementable: the “low hanging fruit” of adaptive management
- Other important strategies for the CABY Region
- Alternative energy is a good investment for a variety of local government and business entities in the region, especially with financial incentives
- Small scale hydropower development is of interest to several entities
 - There are some regulatory hurdles for these projects (see “governance” objectives)
- Solar power has been implemented by local governments in the region, and there is interest in expanding it
- Solar and hydropower are “clean” energy sources from which the region can benefit economically, and the state can benefit from an emissions standpoint

5. Programmatic Area: Human-Landscape Interaction

- Human-landscape interaction is an important issue to the CABY Region because:
 - Stakeholders recognize humans as part of the natural system and part of CABY watersheds
 - Much of the landscapes in the CABY Region have been changed because of human actions – this has both positive and negative implications: humans denuded landscapes and destroyed rivers in their pursuit of gold in the late 1800s, but humans have also restored meadows and streams to ecological function, also improving water quality and supply for urban and agricultural uses

- CABY will address this issue through:
 - Managing the balance of the environmental, economic, and social elements of resource use in a sustainable way
 - A recognition and respect of the diverse uses of resources within the region balanced with the preservation of system flexibility and species and habitat diversity and functionality

5.1. Primary Issue: Habitat Alteration

- Many native ecosystems are under extreme pressure from human sources, including pressure from development, recreational activities, invasive species, and catastrophic fire events, all compounded by climate change
- The discussion surrounding this issue came about partially due to the large amounts of land converted from open space and agriculture to urban and transportation uses in the CABY Region
- It's also an issue related to a regional response to and in preparation for climate change – often land that's converted from its native state is land that would otherwise be essential in preserving the connectivity and wildlife corridors
 - CABY stakeholders hope that the work done in answer to this objective results in an identification of migration and movement corridors for wildlife and places of connectivity important to native species movement – both annual and in response to climate change
 - It is essential that habitat corridors be identified and preserved so that species have a way to migrate as the climate and habitats change
- Urban development and transportation corridors are usually considered permanent, so it's imperative to identify and preserve migration connectivity before these key locations get developed
- It is hoped that, through the achievement of the CABY Objectives, ecosystem integrity is protected and that the ecosystems essential to answering a variety of demands can continue to serve those needs

5.2. Primary Issue: Native American Uses

- Stakeholders recognize that there are traditional uses of resources within the CABY Region going back before the arrival of Europeans and the gold rush
 - Values include materials used for traditional crafts, spiritual practices, medicinal uses, and more
 - These species are often found in riparian areas
 - These traditional uses are often threatened by the destruction of habitat and/or the contamination of water resources
- The preservation of habitat is essential to preserving these uses and the traditions dependent on the availability of resources
- It may be important to preserve these areas without alerting the general population to the values of the resources on them – this will protect the integrity of the area

5.3. Primary Issue: Flooding

- Flooding is a problem in areas of historic floodwater confluence, and is often where development has occurred
- Flood risk can be exacerbated by the development of impermeable surfaces upstream, or the destruction of natural attenuation structures (natural flood plains, settling ponds, and infiltration basins)
- Living in a flood zone can result in mandatory flood insurance for people who may not be able to afford it
- Stakeholders are interested in passive flood management, including green infrastructure
 - This is due largely to the cost effectiveness of the measures and the ancillary benefits they provide (such as increased groundwater recharge)– they are less costly and solve the same problem as more costly, more infrastructure-intense solutions.

5.4. Primary Issue: Open Space

- Many inhabitants of the region are not born here, but were attracted to the region due to the rural, “natural” aesthetic
 - Preserving open space is essential to preserving the character of the region
 - This aesthetic is also a component in drawing tourism
- One of the best ways to preserve open space is through economic incentives, including conservation easements
- Permanent protection is essential because of the long-term planning that open space corridors imply, as well as the species that become dependent upon that resource (see “Habitat Alteration”, above)

5.5. Primary Issue: Disadvantaged Communities

- The planning area is made up of a large number of disadvantaged communities, due largely to a difficult transition from the historic extraction-based economy
 - Challenges of disadvantaged communities can be similar to those of larger and more affluent areas (see “aging infrastructure” and “conservation” under the Water Supply section), but are felt more acutely and with fewer management resources
 - Drinking water quality is an important concern for these areas: it can be affected by inadequate system pressure (due to failing and/or inappropriately sized systems) and by out-of-date (or absent) treatment infrastructure
- While communities pursue alternative forms of economic development, the CABY Planning Committee would like to prioritize DAC projects to encourage further regional investment in these communities
- This policy extends to the staff and project team working to implement the CABY IRWMP; these employees and consultants will give additional effort to the process of identifying and developing DAC-area projects
- Water is a human right, and clean water and wastewater treatment are essential to a healthy, productive life

5.6. Primary Issue: Recreation

- Recreational activities – both outfitting and the sale of equipment and experiences – are a major economic driver in the region
- Forests within the CABY Region are known as “urban forests”: they are within 100 miles of two metropolitan areas hosting at least 1 million people
- Greater recreational use in the region not only creates a robust economy, but it also builds political support for the restoration and preservation of the environment within the region, including meadow restoration, riparian areas along rafting runs, and hiking and equestrian trails
- In the interest of building and maintaining local economies, stakeholders encourage project development to include the consideration of recreation, both the potential for new activities and the enhancement of in-place activities

5.7. Primary Issue: Hydropower

- Hydropower is an important use of CABY resources, providing an emissions-free method of producing electricity and a substantial revenue stream that offsets operational costs of many water purveyors and their customers
- There are five major hydroelectric power producers active in the region, as well as multiple small-scale producers
- Stakeholders have noted the potential for small-scale hydropower development on pipes and canals throughout water purveyors’ service areas
 - Because of the limited-to-no environmental damage that small hydro would create, and the potentially large benefit to the region of producing this power, stakeholders have identified this issue as important to the region
 - A potential limiting factor to small hydro development are issues related to regulatory barriers (see “Governance – Regulatory” for more information on this issue)
 - Small hydropower is a way to capture the potential energy of water ascending the west slope through existing pipelines and canals through the placement of turbines and generators along pipes and canals

5.8. Primary Issue: Agriculture

- Unique agricultural communities and experiences are an important component to CABY Region communities and economies
- Both “Apple Hill” in El Dorado County and “Placer Grown” in Placer County attract tourism and feed the community and the local economy
- The use of land resources for agricultural production helps in maintaining the rural nature of the region
- One of the best ways to preserve this agricultural land is through economic incentives, including conservation easements and financial support of their products
- New Irrigated Lands Regulatory Program surface and groundwater monitoring requirements are threatening the viability of agriculture in the Region; these are one size fits all regulations that were developed with large, high intensity valley agricultural operations in mind and are not appropriate for the low intensity agriculture occurring in much the region nor for the geology of the region located outside the managed valley groundwater basins

5.9. Primary Issue: Sustainable Economy/Self Sufficient Communities

- CABY stakeholders desire to support regional project and business development through financial means
- This support could result in small grants and/or micro-loans
- Projects making use of these funds would need to focus on resource management activities, such as timber management, fire and fuels control, agriculture, recreation, energy production, and/or other efforts deemed important to the region by the CABY stakeholders
- The CABY RWMG (non-profit) would likely manage these funds
- The funds could potentially come from anywhere, including CABY stakeholder organizations, foundation grants, and/or community development funds

5.10. Primary Issue: Governance**5.10.1. Political**

- Political capital within the CABY Planning Committee is an important resource to maintain for ongoing organizational support
- Much of this support can be developed and maintained through active and persistent education of and outreach to the management staff and Boards of participating organizations
- Stakeholders support the consistent outreach of the CABY executive director or designated alternate (CABY representative of that organization) through annual presentations to the Board and/or management staff
- The CABY staff and/or project team will create outreach materials updated as needed for use by presenters
- The CABY staff will also be responsible for tracking organizational participation

5.10.2. Legislative

- Because of the rural nature of the Sierra, and it being the source water area for approximately 60% of California's water supply, it's important to maintain its profile in the State legislature and to ensure that all participants are aware of legislative activities affecting the region
- There is an annual Sierra Lobby Day at the Capitol (organized by the Sierra Fund) in which the CABY staff will participate
 - The CABY staff will alert stakeholders of this event and encourage participation
- It's important that the CABY agencies continue to be aware of legislative efforts with the potential to affect the region – positively and negatively
 - CABY staff will stay abreast of these issues through contact with local legislators and member organizations' Boards of Directors
 - When necessary, action will be taken based on input from the CABY Planning Committee and Coordinating Committee
 - Legislative issues will also be discussed with other Sierra-region IRWM groups through continued participation in the Sierra Water Workgroup

5.10.3. Regulatory

- Regulatory requirements – by the State and the federal governments – can increase the time it takes to develop and implement a project, as well as the cost
 - One of those regulations/laws important to the region (being a source water area) is the inability to maintain ownership of treated effluent if a natural waterway is used to convey the recycled to a willing buyer: in hilly terrain, the sale of recycled water to a downstream user is in many cases more cost effective than building infrastructure to store and pump water back up the hill to the customers that generated the wastewater
 - Irrigated Lands Regulatory Program regulations are also onerous and inappropriate for agriculture in many areas of the CABY region
 - Small hydropower development – regulation restrictions regarding onsite use – characterization of small hydro (baseload vs. non-peak vs. other (preferred)) – water-energy need is seasonally coincident
- Stakeholders advocate the development of a task force/committee to examine regulations relevant to projects implemented in the region and work to identify those that are conflicting and/or hindering implementation of the CABY IRWMP

6. Overarching Objectives

Overarching objectives are those topics that seem to come up with every discussion of specific issue-based objectives. These are components of the CABY planning process that will be considered for every program implemented and for every project concept.

6.1. Education and Outreach

- As identified in several issues above, education is an integral component to the preservation and restoration of CABY natural resources, and will be considered as a possible component for every project that CABY identifies for implementation

OV-1: Where possible, outreach and education will be integrated into all CABY projects and programs; this will include both school education and public and community outreach.

6.2. Financial Feasibility and Sustainability

- Stakeholders have identified this as an issue because of the large-scale planning it requires on both an organizational and a funding level
- Stakeholders will work to refine this issue through the development of a finance and organizational plan for the CABY entity, which will include goals and objectives for gauging success of implementation

As there is a section of the IRWMP that will address both short- and long-term financial feasibility of the IRWMP; stakeholders feel that it's not necessary to develop an additional objective to underscore this. In addition, the "sustainable economy/self-sufficient communities" objective also touches on the goals of the region regarding financial sustainability.

6.3. Data Analysis and Monitoring

- One of the benefits of the IRWMP process is the sharing of data and findings between organizations and entities
- In order to preserve and enhance this benefit, stakeholders have identified the sharing of data and continual development of the SWIM website as an integral component to IRWMP preparation and update as well as project implementation

6.4. Regional Planning and Land Use

- Water and land use are relate closely throughout the state, but with various levels of coordination
- Because of this fact, stakeholders have aspired to integrate and coordinate water management and land use planning decisions wherever possible (further discussed in the water-land use chapter)
- In addition, the emphasis of school and community education has risen to the surface as a priority with regard to land use issues of storm water management and low-impact design