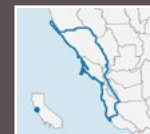


Coastal Scrub



Ecosystem Description

Coastal scrub ecosystems are typically found in cool and mesic environments and are characterized by the presence of drought-deciduous shrub species and a consistent herbaceous layer. The dominant coastal scrub species in the GGB region is the evergreen shrub coyote brush (*Baccharis pilularis*), alongside California sagebrush (*Artemisia californica*), blue blossom (*Ceanothus thrysiflorus*), coffeeberry (*Frangula californica*), and Pacific poison oak (*Toxicodendron diversilobum*).

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Ecosystem Vulnerability - Moderate

Sensitivity & Exposure - Moderate

| Projected Changes | Trend |
|-------------------|------------|
| Heat waves | ▲ Increase |
| Precipitation | ▲▼ Varies |
| Drought | ▲ Increase |
| Coastal fog | ▼ Decrease |
| Wildfire | ▲ Increase |

Potential Impacts:

- Reduced seed production for insect-pollinated plants due to temperature-driven changes in flowering and insect life cycles
- Altered coyote brush seedling recruitment and increased competition for resources (e.g., sunlight, nutrients) due to the expansion of exotic annuals following precipitation increases
- Decreased nutrient mobility and absorption in plants during periods of drought
- Increased moisture stress and greater evaporative water loss from leaves if the frequency of coastal fog declines
- Altered plant growth, nutrient cycling, and soil chemistry as a result of nitrogen deposition from wildfires

Non-climate stressors may interact with climate stressors and disturbance regimes:

- *Residential and commercial development* creates barriers that restrict animal movement and seed dispersal, reducing genetic diversity and natural habitats
- *Invasive forbs and annual grasses* often become established in recently-burned areas and can increase competition for resources and reduce the richness and diversity of native species
- *Livestock grazing* can influence soil moisture and fire frequency, impacting community structure, composition, and species diversity



Although coastal scrub has relatively low sensitivity to disturbance regimes and non-climate stressors, changes in climate factors that impact plant water availability are likely to influence functional group dominance and patterns of succession.

Ecosystem Vulnerability - *Moderate*

Adaptive Capacity - *Low*

Intrinsic factors (i.e., inherent characteristics) that enhance or undermine adaptive capacity:

Enhance:

- Complex structure and high species diversity
- Well-adapted to drought and wildfire
- Ability to recover rapidly following disturbances
- Provides habitat for diverse plant and wildlife communities

Undermine:

- Loss of frequent disturbances (e.g., grazing, fire) threatens ecosystem integrity
- Fragmented ecosystem due to urbanization, contributing to reduced gene flow

Extrinsic factors (i.e., management potential) that enhance or undermine adaptive capacity:

Enhance:

- Aesthetically and ecologically valued by the public, as well as recreational opportunities provided

Undermine:

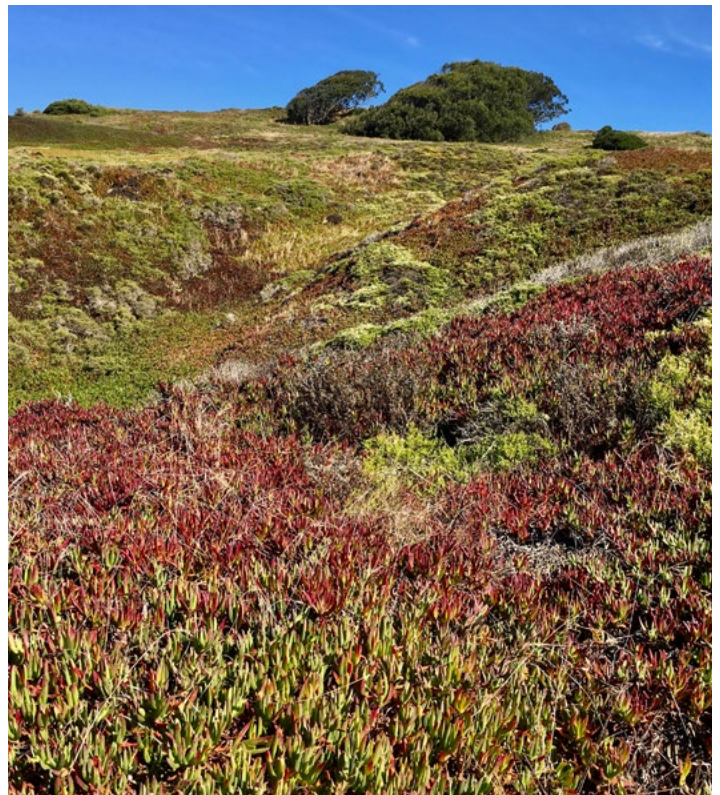
- Challenges associated with monitoring and controlling invasive species



Although coastal scrub species have adaptive traits that allow them to persist under harsh conditions, degradation and fragmentation due to urbanization and disturbance threaten species movement and diversity.



Coyote brush, Jerry Kirkhart, Flickr (CC BY 2.0)



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Adaptation Strategies & Actions

Adaptation strategies can reduce climate change vulnerability of a given ecosystem or species by addressing any or all of the three components of vulnerability (i.e., by reducing sensitivity, reducing exposure, and/or increasing adaptive capacity). The table below presents examples of adaptation strategies and actions, which fall within five categories, or approaches: Resistance/Resilience **(R)**, Acceptance **(A)**, Direct/Response **(D)**, Knowledge **(K)**, and Collaboration **(C)**. *Please note that the strategies and actions provided here should not be considered a checklist or plan, but rather as a set of examples for land managers to consider for further study when developing site- or species-specific actions.*

| Adaptation Strategies | Adaptation Actions |
|--|---|
| <p>Prevent the introduction and establishment of invasive species and remove existing populations</p> | <ul style="list-style-type: none"> Remove non-native annual grasses and other invasive plant species using a variety of treatments (e.g., prescribed fire, mowing, hand pulling, herbicides) (R) Continue to monitor known or potential invasive species, and regionalize and share this work (R/K/C) |
| <p>Restore the role of fire as an ecological process on the landscape</p> | <ul style="list-style-type: none"> Use prescribed burning to remove encroaching woody vegetation and increase vigor and recruitment in native grassland and shrubland plants, taking care to avoid excessive shrub mortality (R) Partner with local tribes to share resources and expand the use of cultural burning and managed wildfire (C) |
| <p>Maintain and/or create migration corridors for native plants and wildlife</p> | <ul style="list-style-type: none"> Map and characterize connectivity between natural areas for the migration of plant and animal species most in need of corridors (R/K) Protect and maintain priority corridors and potential climate refugia for sensitive species via acquisition, realty actions, or land trades (R) |
| <p>Increase understanding of current conditions and projected future changes in grasslands and shrublands</p> | <ul style="list-style-type: none"> Identify species that may disappear due to climate-driven changes (e.g., rare and/or specialized species) and determine whether other species will be able to fulfill a similar functional role within the ecosystem (A/K) |
| <p>Improve regional collaboration and coordination with regard to data sharing and monitoring</p> | <ul style="list-style-type: none"> Implement an interagency committee to develop an adaptive management framework with a data-sharing and monitoring component (C) |

Adaptation strategies and actions suggested by individual stakeholders (not discussed during the December 2023 adaptation workshop).