Springs

A spring in Washoe County.
Photo by Elisabeth Ammon.

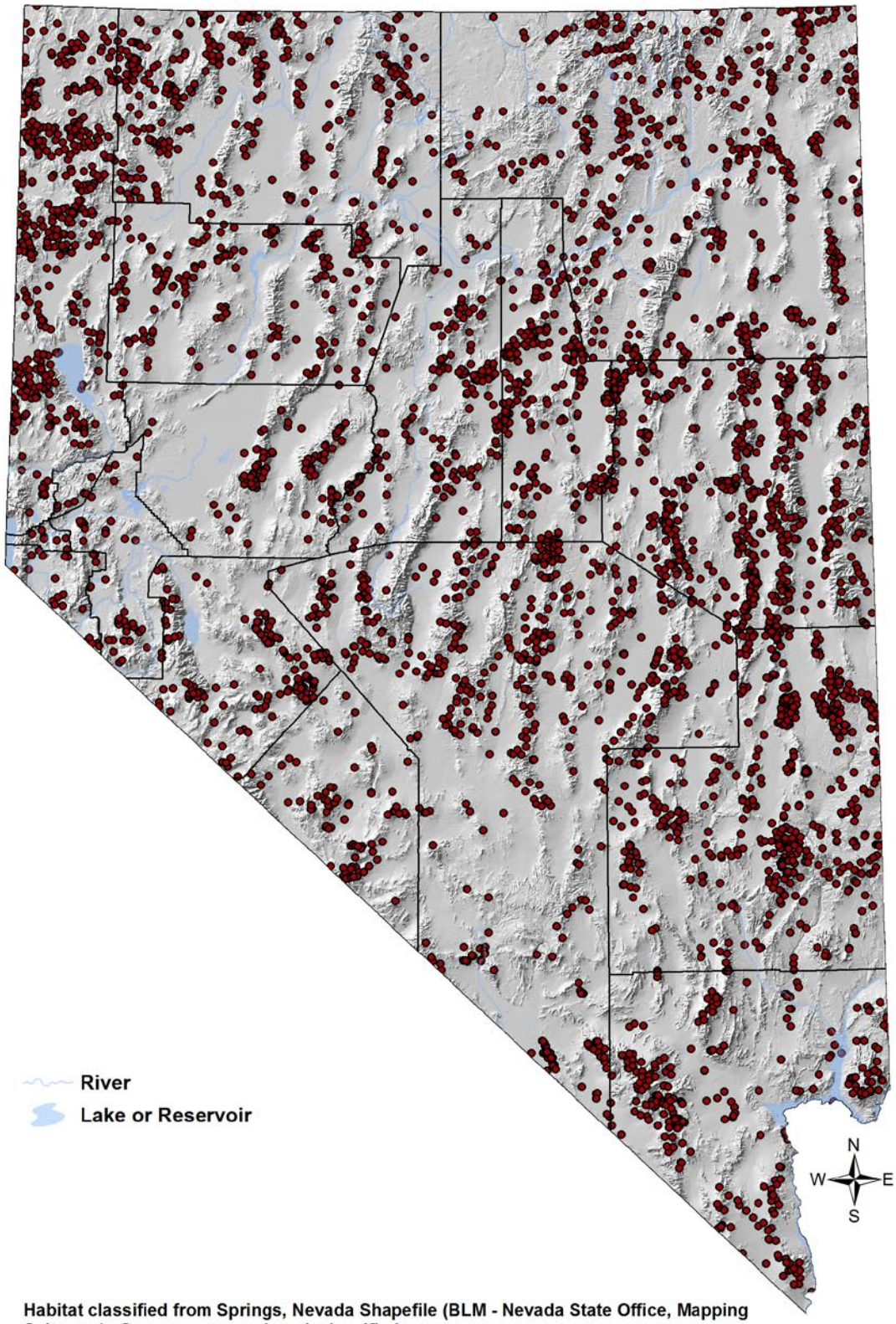
Key Bird-Habitat Attributes

Stand Structure	Dense, often small deciduous trees, mesic shrubs, and grass and flowering forb understory; transition into upland often with other deciduous shrub species
Ideal Scale for Conservation Action	10 ha [25 ac] or more, including a minimum of 2 km [1 mi] of outflow stream where applicable
Plant Species Composition	For larger springs, willow, mesquite, baccharis, quailbush, alder, aspen, water birch, wild rose, currant, and other mesic species; for smaller springs, saltgrass, rushes, sedges, and aquatic (submerged) plants
Understory	Closed-canopy shrub thickets interspersed with natural meadow openings ideal
Presence of Cliffs > 30 m [100 ft] Tall	Presence of tall cliffs increases value to birds

Conservation Profile

Estimated Cover in Nevada	4,179 individual springs (Great Basin: 3,752; Mojave: 427)
Landownership Breakdown (% of springs)	BLM = 60% Private = 21% USFS = 12% Other = 7%
Priority Bird Species	Gambel's Quail Costa's Hummingbird Calliope Hummingbird Rufous Hummingbird Willow Flycatcher (SWFL) Abert's Towhee (Greater Sage-Grouse) (Mountain Quail) (Northern Goshawk) (Yellow-billed Cuckoo) (Lucy's Warbler)
Indicator Species	Yellow Warbler
Most Important Conservation Concerns	Livestock, wild horse and burro grazing Surface water diversion and impoundments Groundwater pumping Invasive weeds Climate change (change in precipitation and temperature) Motorized recreation
Recovery Time	15-20 years (with available water)
Regions of Greatest Conservation Interest	Southern Nevada (Clark, Nye, Lincoln counties), northwestern and central Nevada
Important Bird Areas	Ash Meadows NWR Bilk Creek – Montana Mountains Great Basin National Park Lahontan Valley Wetlands Lake Mead Moapa Valley Monitor Valley North Ruby Valley Oasis Valley Pahranagat Valley Complex Sheldon NWR Spring Mountains Toiyabe Range

Springs



Habitat classified from Springs, Nevada Shapefile (BLM - Nevada State Office, Mapping Sciences). Some areas may be misclassified.

Springs

Overview

Springs occur throughout Nevada, from valley bottoms to high mountains. Montane springs are often the result of water surfacing from seasonal underground sources (e.g., snowmelt seeping into rocky slopes), while valley springs are often the result of groundwater upwells. For this plan, springs are defined as surface water bodies generated by an upwelling, along with their associated mesic vegetation and outflow channels. Springs usually occur in patches too small to reliably support riparian or aquatic obligate bird populations, although larger patches of Springs habitat and smaller patches of riparian woodland by be functionally equivalent. Springs are thought to provide valuable shelter, water, and foraging opportunities for many upland bird species, particularly in an arid state like Nevada. Greater Sage-Grouse, for instance, seek out wetter areas rich in forbs and insects during critical periods of their annual cycle, and springs may often provide these resources. Other upland species, such as Brewer's Sparrow, are more likely to occur where surface water is nearby (p. Spp-73-1). Therefore, while smaller springs may not support significant bird populations by themselves, they may greatly increase the abundance and diversity of birds in upland landscapes within which the springs occur.

Research quantifying the role of springs in sustaining bird communities is limited. Richardson et al. (2007) recently studied bird responses to high-elevation springs of the Spring Mountains. They found that 34 species became less abundant with increasing distance from the spring, up to a distance of 500 m [1,600 ft]. The importance of lowland desert springs to birds has been largely unstudied, although expert opinion of the planning group was that springs and transitional areas were critical for several Mojave Desert Priority species, including Costa's Hummingbird, Gambel's Quail, and Abert's Towhee. We encourage research that evaluates the use of springs by upland Priority species throughout the state. In Figure Hab-19-1, we illustrate the Springs habitat elements that are important to Priority species.

In addition to being understudied, springs are badly under-inventoried throughout the state. They are often misclassified or simply missing from land cover maps, and even where springs are correctly plotted, few of their attributes are classified, and their associated mesic vegetation cover is usually too limited in extent to even register on the map. With over 4,000 springs that were originally mapped in Nevada, one of our strongest conservation recommendations is therefore to conduct a comprehensive inventory of historic spring sites to determine how many have been lost or altered, and how many are intact. We further recommend developing a formal sampling effort to monitor springs for signs of change in discharge or in mesic habitat cover, which may be attributable to climate change and increased demands on water.

Main Concerns and Challenges

The following top seven conservation concerns were identified in our planning sessions for Spring habitat in Nevada:

- Overgrazing by livestock, wild horses and burros
- Surface water diversion, impoundments
- Groundwater pumping

Springs

- Invasive weeds
- Change in precipitation and snowmelt related to climate change
- Change in temperature related to climate change
- Motorized recreation

Springs are vulnerable to many of the same impacts as riparian areas (pp. Hab-7-1, Hab-11-1, and Hab-13-1), including overgrazing, water diversions, and invasive weeds. Wet areas invariably draw attention from grazing animals, and because spring patches are typically so small, they can be degraded more quickly than larger riparian zones. Invasive weeds, facilitated by disturbance, may then take hold. For the same reason, even relatively small changes in water availability can significantly alter a spring's hydrology and outflow. Climate change is therefore a significant concern, since many springs depend on snowpack and precipitation for their discharge. Climate change may affect spring systems earlier and more severely than other mesic habitat types that occur in larger patches and have access to more abundant water supplies. Given that little is known about how birds depend on access to springs, especially in desert regions, it is not possible to estimate how the loss of springs or the degradation of their associated mesic vegetation might affect bird conservation. As mentioned above, a significant effort is needed to inventory and monitor springs and their associated bird communities throughout Nevada in order to better understand these issues.

The upside of springs conservation is that restoration efforts can often be very effective in a fairly short time span, and for relatively moderate costs, as long as spring outflows are still present. Several successful spring restoration projects have been conducted in Nevada by management agencies (e.g., Ash Meadows NWR), which benefitted not only the spring itself but associated wetlands and riparian areas. Restoration projects may involve creating exclosures, altering the timing of grazing activity, providing alternative water and shade sources for domestic livestock, conducting weed control, and even re-engineering of the spring itself. Assuming that the spring and its associated mesic vegetation are in good condition, it is also important to manage adjacent upland areas to maximize their habitat quality. Both suitable uplands and intact springs are required to realize their full synergistic benefits to birds.

Springs

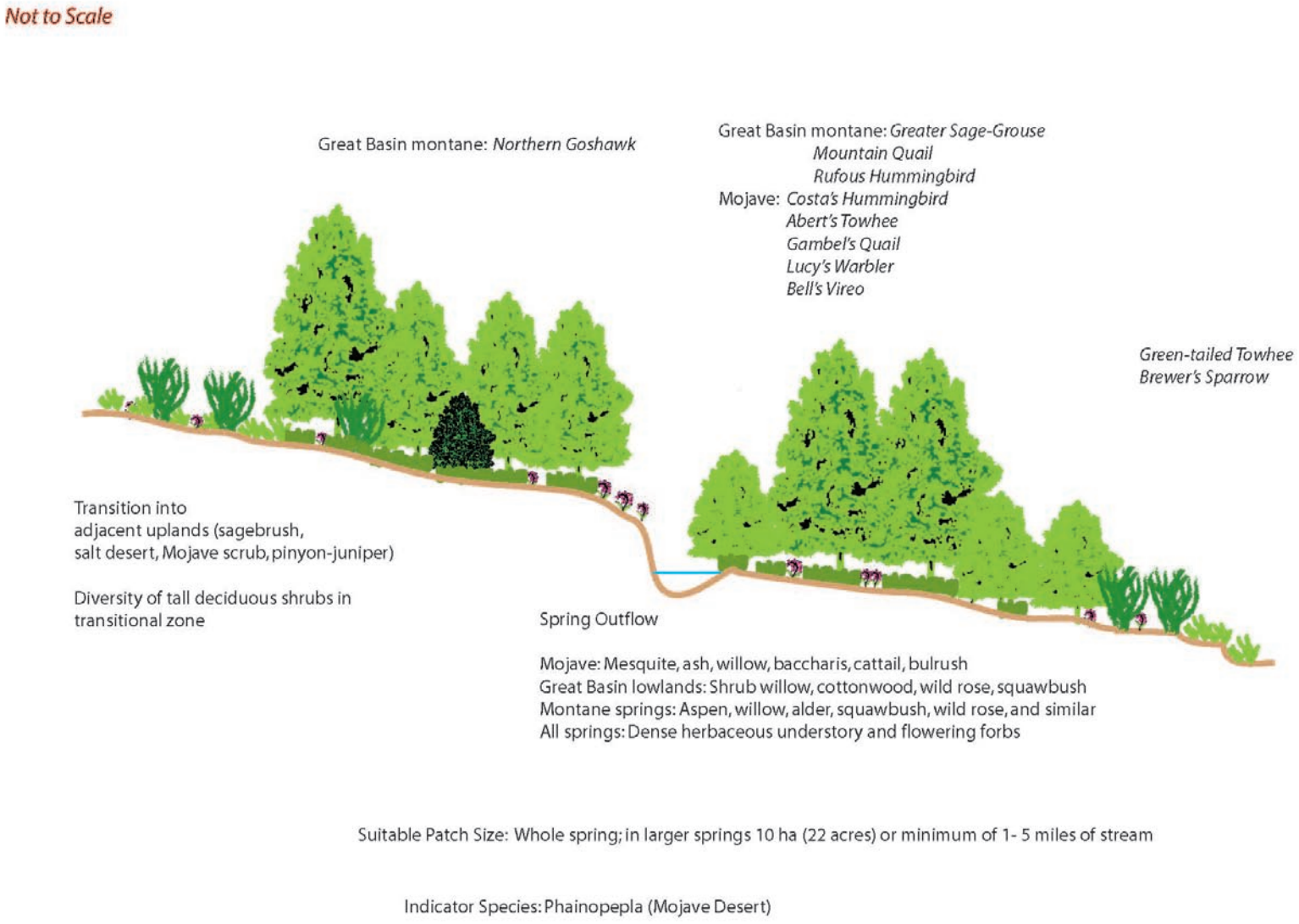


Figure Hab-19-1: Idealized springs landscape to maximize the number of springs-associated Priority bird species.

Conservation Strategies

Habitat Strategies

- Manage **whole spring** or, for larger springs, **10 ha [25 ac] and/or 2-3 km [1 – 5 mi] of outflow channel and associated floodplain**, with preference given to larger areas, wider outflow corridors, or more linear distance of outflow stream. Even small spring patches are valuable, but the desired mesic conditions are better realized with larger overall patch sizes. Sufficient **buffers** (up to 1 km [0.6 mi]) of adjacent transitional and upland habitat types are desirable to provide connectivity for upland birds
- Protect, to the extent possible, the **water source** of springs, particularly for larger, perennial springs
- Critical habitat components include **dense shrub thickets** (mesquite, willow, alder, wild rose, or other mesic species) with patches of **mesic herbaceous cover** interspersed. Sites that cannot support deciduous woodlands are also important if native herbaceous cover and access to water exists. Potentially detrimental land uses, such as prolonged livestock, wild horse, or burro grazing and motorized recreation, may be controlled by fencing and providing alternate access to water and shade
- Single **large trees**, small groves, and large snags provide important opportunities for some Priority species, and should therefore be protected to the extent possible.
- **Restoration of historic outflow channels** and associated floodplains is a high priority for larger springs that have been altered for water diversion. The primary requirement is sufficient water, and if no source vegetation is available, plantings of native woodlands will significantly accelerate restoration.

Research, Planning, and Monitoring Strategies

- One of the highest statewide priorities for Spring habitat conservation planning is to **inventory historic spring sites**, determine condition of remaining springs, and to develop a **monitoring plan that can capture trends associated with changing climate or changing water supplies**
- Expand current efforts of **long-term monitoring of landbirds** through the Nevada Bird Count to better capture Spring habitat sites

Public Outreach Strategies

- **Promotional materials** that convey the value of springs to wildlife and ways to avoid unintentional impacts should be made available to private landowners, managers, and the general public.