Summary Table. Characteristics of the Ecology																	
5 . Level IV Ecoregio	SIERRA NEVADA ns Physiography	Geology	Geology Soils				e	Potential Natural Vegetation*/	Land Cover and Land Use	13. Level IV Ecoregions	CENTRAL BASIN AND Physiography	I RAL BASIN AND RANGE (continued) Physiography Geology Soils Climate Potential Natural Vegetation*/ Land Cover and					Land Cover and Land Use
	Area (square miles)	Elevation/ Local Relief (feet)	Order (Great Group)	Common Soil Series	Temperature/ Moisture Regimes	Precipitation Mean annual (inches) Host Free Mean annua (days)	Mean Temperature January min/max; July min/max (°F)	Present Vegetation *Source: Kuchler, 1964		Area (squai miles	a vire s) Elevation/ Local Relief (feet)	Surficial and Bedrock	Order (Great Group) Common Soil Serie	s Temperature/ Moisture Regimes Precipitation Mean annual (inches) (d	st Free n annual days) Mean Temperature January min/max; July min/max (°F)	Present Vegetation *Source: Kuchler, 1964	
5a. Mid-Elevation Sierra Nevada	 237 Low mountain slopes, ridges, and alluvial fans of fault block mountain ranges that are drained by medium-gradient, cool, perennial or intermittent streams. Riffle substrates are composed of cobbles and boulders. Snow-melt and springs supply streams with water. 127 Glaciated. High mountain slopes, peaks, 	5000-7500/ 400-2500Quaternary colluvium and glacial outwash. Mostly Tertiary andesite and Mesozoic granitic rocks; some Jurassic-Triassic shale sandstone, volcaniclastic rocks, andesite, and rhyolite. Rock outcrops occur.7500-10800/Quaternary colluvium, morainal deposits,	 Mollisols (Argixerolls), Entisols (Xeropsamments), Alfisols (Haploxeralfs) Entisols 	Fraval, Corbett, Toiyabe, Booford, Jumbo, Duckhill, Inville, Softscrabble, Gabica	Frigid/ Xeric, Aridic bordering on Xeric Frigid, Cryic/	14-35 50-100 35-55+. 30-80	19/41; 46/78	Mixed conifer forest/ Jeffrey pine, ponderosa pine, sugar pine, white fir, and incense cedar. Forest openings: fire-maintained chaparral with manzanita, mountain-mahogany, snowberry, serviceberry, mountain big sagebrush, Sierra chinquapin, antelope bitterbrush, and prostrate ceanothus.	Open, mixed evergreen forests, shrubland, and grassland. Logging, wildlife habitat, rangeland, woodland grazing, and recreation. Some placer gold mining. Streams have been diverted to irrigate cropland in lower elevation ecoregions. Lake trout, kokanee, brown trout, rainbow trout, and mountain whitefish are found in Lake Tahoe.	13x. Sierra Nevada- Influenced Ranges	 9 Mid-elevation mountain slopes, crests, ridges, and plateaus that are contiguous with or near the Sierra Nevada. Seasonal pools and small lakes are scattered throughout the ecoregion. Perennial or intermittent, high- to medium-gradient, cold streams occur. Perennial streams are most common at high elevations. Riffle sections generally have cobble substrates 	Quaternary colluvium and basalt flows. Tertiary andesite and tuffs. Mesozoic granitic rocks dominated by quartz monzonite and granodiorite. Cretaceous diorite. Jurassic-Triassic shale, sandstone volcaniclastic rocks, andesite, and rhyoli Rock outcrops occur.	Mollisols (Argixerolls), Alfisols (Durixeralfs), Entisols (Xerorthents) te. Cagle, Duco, Hyloc Ister, Borealis, Powment	, Mesic, Frigid/ 10-16 Les Aridic bordering on Xeric	ss than 19/42; 0-120 49/81	Mostly juniper–pinyon woodland. Highest areas: mountain- mahogany/ Singleleaf pinyon, Utah juniper, low sagebrush, Wyoming big sagebrush, mountain big sagebrush, antelope and desert bitterbrush, green ephedra, currant, bottlebrush squirreltail, Thurber needlegrass, Sandberg bluegrass, bluebunch wheatgrass, Indian ricegrass, and cheatgrass. Highest areas: mountain brush and small stands of white fir, ponderosa pine, lodgepole pine, Jeffrey pine, western white pine, and white bine.	Woodland, brushland, rangeland, wildlife habitat, and recreation. Historic gold and silver mining. Amalgamation processes from late-19th century mines elevated metal concentrations (particularly mercury) in some streams. Active sand, gravel, and gold mining. Includes streams that have been state-designated for protection as priority or critical cold water fishery habitat. Stream diversions for agriculture occur.
Sierra Nevada	ridges, lateral moraines, terminal moraines, and lakes. Streams are primarily high gradient and perennial. Many riffles occur and have cobble or boulder substrates. Snow-melt and cool springs supply streams with water.	400-3300 and alluvium. Mostly Tertiary andesite and Mesozoic granitic rocks; some Jurassic- Triassic shale, sandstone, volcaniclastic rocks, andesite, and rhyolite. Rock outcrop are common.	d (Cryopsamments), Andisols (Haplocryands), Inceptisols (Dystroxerepts, Dystrocryepts), Alfisols (Haploxeralfs)	Tallac, Sibelia, Fugawee, Carioca, Boomtown, Witefels	Xeric	Mostly falling as snow.	45/73	Jeffrey pine, Sierra lodgepole pine, mountain hemlock, western white pine, whitebark pine, Washoe pine, manzanita, snowbrush, prostrate ceanothus, and dwarf sage.	shrubland and meadows occur at higher elevations. Wildlife habitat and recreation. Water quality is only lightly influenced by human activities. Streams contain non- native brown, brook, and rainbow trout. The federally-threatened Lahontan cutthroat trout occur in the Truckee River system.	13y.Sierra Nevada- Influenced High Elevation Mountains261	I High elevation mountains, ridges, hills, and plateaus. Contains cold, high-gradient, headwater streams that are fed by springs and snow-melt. Riffle sections have cobble and boulder substrates. 9000-13800/400-4800	Quaternary colluvium and volcanic ash. Quaternary breccia, andesite, and basalt. Mesozoic granitics dominated by quartz monzonite and granodiorite. Cretaceous diorite. Jurassic-Triassic shale, sandstone volcaniclastic rocks, andesite, rhyolite, a granitic rocks. Bock outcrops are comme	Mollisols (Argixerolls, Argicryolls) Kiote, Hiridge, Devils	Frigid, Cryic/ Aridic bordering on Xeric, Xeric	ss than 16/39; 0-100 45/76	Mountain-mahogany/ Subalpine-alpine forbs, mountain big sagebrush, low sagebrush, mountain-mahogany, and aspen groves. Scattered individuals or small stands of high elevation conifers.	Brushland, shrubland, open evergreen forest, deciduous trees, rangeland, wildlife habitat, and in some areas, recreation. Historic gold and silver mining. Active gold mines.
13. CENTRAL BASIN AND RANGE								13z.Upper Lahontan Basin4628	8 Nearly flat to rolling, broad valleys containing lake plains, alluvial fans, bajadas, a few hills, and eroded gullies. Drained by medium- to low-than 50-500; 4000-6200/Mostly less than 50-500;	Valleys: mostly Quaternary alluvial, play and marsh deposits. Contained pluvial la during the Pleistocene. Hills: Tertiary sil	ra, Entisols (Fluvaquents, kes Torriorthents), Aridisols Bubus, Dun Glen, icic (Haplocambids, Tenabo, Orovada,	Mesic/ 5-10 90 Aridic bordering on	D-120 12/44; 48/92	Mostly saltbush–greasewood and Great Basin sagebrush community/ Shadscale, black greasewood, rabbitbrush, bud sagebrush, Wyoming big sagebrush, spiny hopsage, fourwing	Shrubland, rangeland, wildlife habitat, recreation, home sites, and irrigated pastureland and cropland. Stream diversions for agriculture are common. Livestock grazing has reduced native grasses and biological soil crusts. Historic gold, silver,		
Level IV Ecoregio	ns Physiography Area (square miles)	Geology Elevation/ Local Relief (feet) Surficial and Bedrock	Order (Great Group)	Soils Common Soil Series	Temperature/ Moisture Regimes	Precipitation Mean annual (inches) Frost Free Mean annua (days)	e Mean Temperature January min/max; July min/max (°F)	Potential Natural Vegetation*/ Present Vegetation *Source: Kuchler, 1964	Land Cover and Land Use		streams. Riffle sections have substrates composed of cobble-size or smaller material. A few hot springs occur.	ash-now tunis and tunaceous rocks.	Haplodurids), Inceptisols (Halaquepts)			satiousn, infand satigrass, aikan sacaton, seepweed, bottlebrush squirreltail, Indian ricegrass, creeping wildrye, Great Basin wildrye, Sandberg bluegrass, and Thurber needlegrass. Bud sagebrush and Indian ricegrass are not as abundant as in Ecoregion 13j. Wildfires caused by lightning are common; a post-fire monoculture of cheatgrass tends to replace native grasses and shrubs.	has occurred since the mid-1990s. Some streams have been state-designated for protection as priority or critical cold water fishery habitat. Higher elevation streams associated with the Quinn River drainage support populations of the federally- threatened Lahontan cutthroat trout. Hot springs influence water quality in streams.
13a. Salt Deserts	799 Nearly level playas, salt flats, mud flats, low terraces, and saline lakes. Perennial or intermittent hot springs are common and scattered dunes occur. Internally drained by intermittent and ephemeral streams that can be alkaline. Low-lying areas are ponded during wet intervals. Water levels rise and fall seasonally and from year-to-year. Eroded by wind when dry.	4250-6000/ 0-50 Quaternary playa and marsh deposits; also aeolian deposits. Strongly alkaline, clayey lacustrine sediments are characteristic. During the Pleistocene, extensive pluvial lakes and marshes occurred.	Aridisols (Aquisalids), Inceptisols (Halaquepts)	Mostly playa; also Saltair and Wendane. Soils are mostly clayey, light-colored, strongly affected by salt and alkali, poorly drained, and salt- crusted.	Mesic/ Aridic	5-8 110-160	10/44; 48/92	Mostly barren; also saltbush–greasewood/ Vegetation is mostly absent; only scattered, extremely salt-tolerant plants occur such as pickleweed, seepweed, black greasewood, iodinebush, inland saltgrass, and alkali sacaton.	Mostly barren. Wildlife habitat, recreation, and military reservations. Very low grazing potential. Spring outflows provide water for endemic fishes such as the Independence Valley tui chub, Newark Valley tui chub, Diamond Valley speckled dace, relict dace, and the federally-endangered Clover Valley speckled dace and Independence Valley speckled dace. Spring outflows are commonly diverted for agricultural use.	13aa. Sierra Nevada- Influenced Semiarid Hills and Basins	2 Mosaic of terraces, floodplains, hills, alluvial fans, bajadas, mountain flanks, and canyons. Cold, perennial, high- to moderate-gradient streams are fed by snow-melt and springs. Riffle sections have cobble or boulder substrates. Mostly 4000-6400; some hills to 7000/ Mostly less than 50- 1500; some areas to 2400	Quaternary alluvium. Tertiary andesite, basalt, silicic ash-flow tuffs, and tuffaced sedimentary rock. Mesozoic granitic rocks dominated by quartz monzonite and granodiorite. Jurassic-Triassic shale, sandstone, volcaniclastic rocks, andesite, and rhyolite.	Mollisols (Endoaquolls, Haploxerolls, Argixerolls), Aridisols (Haplocambids, Argidurids, Haplargids, Paleargids) Haybourne, Reno, Jubilee, Voltaire, Surprise, Acrelane, Old Camp, Deven, Galeppi, Mottsville Phing, Holbrook, Koontz, Xman	Mesic/ 7-15 80 Aridic bordering on Xeric	0-135 16/46; 48/92	Great Basin sagebrush community in east and sagebrush steppe in west/ Wyoming big sagebrush, antelope bitterbrush, desert peach, low sagebrush, Lahontan sagebrush, Douglas rabbitbrush, Nevada ephedra, bottlebrush squirreltail, desert needlegrass, Thurber needlegrass, Indian ricegrass, cheatgrass, bluebunch wheatgrass, Sandberg bluegrass, and scattered juniper. Riparian cottonwood woodland with buffaloberry along major rivers.	Shrub- and grass-covered. Rangeland, wildlife habitat, irrigated pastureland, irrigated alfalfa, and small grain farming. Expanding residential and commercial areas occur. Grazing has reduced native grasses and biological soil crusts. Heavy agricultural water use and many stream diversions for agriculture occur in lower elevation areas (e.g. Carson River and East and West Walker River). Historic gold and silver mining. Extensive, active sand, gravel, clay, limestone, and gold mining. Water quality is better at higher elevations. Some streams have been state-designated for protection as priority or critical cold water fishery habitat. Some stream segments associated with the Truckee and Walker rivers support sensitive resident cold water
13b. Shadscale- Dominated Saline Basins	3161 Mostly gently sloping to nearly flat valley bottoms with remnant lake terraces and scattered sand dunes; also fan skirts. Internally drained by a few small intermittent or ephemeral streams. Storm runoff can contain high sediment loads	4100-6200/ 25-1200 Mostly Quaternary alluvium; also loess, lacustrine, and dune deposits. During the Pleistocene, extensive pluvial lakes and marshes occurred.	Entisols (Torriorthents), Aridisols (Haplodurids, Haplargids), Inceptisols (Halaquepts)	Unsel, Jolan, Ocala, Sondoa, Batan, Swingler, Tooele, Sodhouse. Soils are light in color	Mesic/ Aridic	5-10 100-160	10/44; 44/92	Mostly saltbush–greasewood; also Great Basin sagebrush community/ Principally black greasewood, shadscale, bud sagebrush, fourwing saltbush, rubber rabbitbrush, alkali sacaton, pottlebrush squirreltail, inland saltgrass, Indian ricegrass, Great Basin wildrye, and salteta. Local stands of Bocky Mountain juniper	Shrubland, rangeland, and wildlife habitat. Some areas are irrigated for small grains or alfalfa. Where cropland is present, streams are usually diverted for agricultural use. Cattle sometimes graze in shallow wetland habitats created from springs. Valleys along the Nevada-Utah border have been degraded by past livestock management practices. Dune areas support highly diverse rodent and								fish species such as the federally-threatened Lahontan cutthroat trout.
				affected by salt and alkali, and dry for extended periods.				occur.	reptile communities. Streams contain endemic fishes such as the Diamond Valley speckled dace, Independence Valley tui chub, Newark Valley tui chub, White River speckled dace, White River desert sucker, relict dace, and the federally-endangered Independence Valley speckled dace, White River spinedace, Moorman White River	14.	MOJAVE BASIN AND	RANGE					
13c. Sagebrush Basins and	761 Valleys, basin rims, lake terraces, alluvial fans, low hills, and foothills that are internally drained	4900-6600/ 100-1000Mostly Quaternary alluvium. Also Quaternary colluvium, Tertiary rhyolite,	Aridisols (Haplargids, Haplocalcids,	Xerxes, Lembos, Amtoft, Tarnach.	Mesic/ Aridic	8-12 100-160	10/39; 52/90	Great Basin sagebrush community/ Wyoming big sagebrush, antelope bitterbrush, bluebunch wheatgrass, Indian ricegrass, and	 springfish, and Clover Valley speckled dace. Ponds near Shoshone in Spring Valley support the federally-endangered Pahrump poolfish. Shrubland, rangeland, wildlife habitat, and cropland. Livestock grazing has reduced native grasses and biological soil crusts. Many streams are diverted for livestock and 	Level IV Ecoregions	a re Elevation/ Local Relief	Geology Surficial and Bedrock	Soils Order (Great Group) Common Soil Serie	s Temperature/ Precipitation From Moisture Mean annual Mear	limate st Free Mean Temperature n annual January min/max;	Potential Natural Vegetation*/ Present Vegetation *Source: Kuchler, 1964	Land Cover and Land Use
Slopes 13d. Woodland- and	by a few ephemeral, intermittent, or perennial streams. Small impoundments occur. 1649 Low mountain ranges, mountain slopes, ridges,	andesite, and tuffaceous sedimentary rocks and Paleozoic sedimentary rocks dominated by limestone and dolomite. Mostly Quaternary alluvium and colluvium.	Mollisols (Argixerolls,	Soils are dry for extended periods. Pioche, Itca,	bordering on Xeric Mesic, Frigid/	10-18. 75-120	19/42;	Thurber needlegrass along with scattered, invading Utah juniper. On rocky, shallow soils: black sagebrush. Fire has widely destroyed sagebrush allowing non-native cheatgrass to expand. Mostly juniper–pinyon woodland/ Extensive, open Utah juniper	cropland uses. Woodland, shrubland, grassland, rangeland, and wildlife habitat. Large areas have	miles14a. Creosote Bush- Dominated5973	s) (feet) 3 Valleys containing stream terraces, floodplains, alluvial fans, isolated hills, mesas, buttes, and eroded washes. Perennial or enhemeral low- to maximum Mostly 1800-4500; maximum	Mostly Quaternary alluvium; also Quaternary playa, marsh, and alluvial fla deposits. Scattered hills: Tertiary andesit	Aridisols (Petrocalcids, t Haplocalcids), Entisols (Torriorthents), Entisols	Regimes (inches) (d , Thermic, Hyper- thermic/ 3-9. 170	days) July min/max (°F) 0-280 20/56; 60/102	Mostly creosote bush/ Sparse creosote bush, white bursage, cacti, yucca, ephedra, big galleta, and Indian ricegrass. Mesquite and acacia increase toward the south and east. Some areas are harren	Covered by scattered shrubs, cacti, and grasses. Rangeland (with a low carrying capacity for cattle), wildlife habitat, urban development, military bases, recreation, gravel operations, and some pastureland and cropland growing alfalfa hay and sod
Shrub-Covered Low Mountains	hills, foothills, and alluvial fans. A few perennial or intermittent, medium- to low-gradient streams occur and are fed by snow-melt and numerous springs.	5000-9000; maximum 9300/ 200-3300Tertiary rhyolitic and andesitic rocks, tuffs, and tuffaceous sedimentary rocks. Paleozoic sedimentary rocks dominated by limestone and dolomite. Cambrian quartzite. Rock outcrops occur.8500.12062/ 0Operator and selected occur.	Durixerolls, Argiustolls, Calcixerolls), Entisols (Torriorthents)	Motoqua, Segura, Cropper, Decan, Zoate, Linco, Clavicon. Soils are often rocky.	Aridic almost Xeric, Aridic bordering on Ustic	Receives summer rainfall.	55/88	and singleleaf pinyon woodland. Wyoming, black, and mountain big sagebrush variously dominate the understory. SE Nevada: understory includes Gambel oak, scrub oak, Joshua tree, and blue grama grass. Above elevational limit of pinyon: narrow band of bitterbrush, cliffrose, western serviceberry, and mountain big sagebrush.	been cleared in an effort to increase livestock forage. Historic gold and silver mining.	Basins	erouge washes. Fereinina of epheneral, low- to medium-gradient, warm streams and rivers occur. Substrates are composed of cobble, sand, or fine sediments. Surface waters are alkaline and have high concentrations of calcium carbonate and total dissolved solids. Flash flooding can follow thunderstorms. Reliable surface water is scarce.Imaximum 6200/ Less than 100-400; mountains to 1200	intrusive rocks, and tuffaceous sedimenta rocks; Jurassic shale; Pennsylvanian limestone; Mississippian limestone; Ordovician limestone, dolomite, and sha Cambrian limestone, dolomite, quartzite, and shale; Precambrian gneiss and schist	le; . (1011010101010101), Nickel, Las Vegas, St. Thomas. Soils at commonly gypsum- and limestone- influenced, light- colored, and alkalin	e. reinfall becomes		of vegetation. Stony limestone soils: blackbrush common in the transition to the Arid Footslopes (14b). Riparian natives: desert willow, coyote willow, and mesquite. Tamarisk is rapidly replacing native desert riparian vegetation.	Historically, truck crops, almonds, apricots, and cotton were growing anana hay and sod. Historically, truck crops, almonds, apricots, and cotton were growin. Farmland in the Las Vegas Valley has almost entirely been replaced by urban development. Historic gold and silver mining and nuclear testing. Active sand, gravel, and limestone mining operations are found near Las Vegas. Stream diversions are common. The Muddy River headwaters support the federally-endangered and endemic Moapa dace. Upland habitat supports the federally-threatened desert tortoise. Riparian corridors support several neo-tropical migrant bird species including the federally-endangered
Carbonate Mountains	 Farliary gractated, high, fugged, hountains. Headwaters for several perennial or intermittent cold water streams fed by snow-melt and cold springs. On porous limestone and dolomite: only a limited amount of surficial water is available. 	1000-4500 1000-4500 Arift. Mostly Paleozoic carbonates and conglomerate, Cambrian quartzite and conglomerate, and Precambrian quartzite. Also Triassic rhyolite and sedimentary rocks and Mesozoic granitics. Rock outcrops occur.	Haplocryolls, Haploxerolls, Cryrendolls), Alfisols (Haplocryalfs)	Agassiz, Hackwood, Hatur, Croesus	Xeric	Receives 30-80 summer rainfall.	48/78	Stands of white fir, Douglas-fir, limber pine, and Engelmann spruce with an understory of mountain big sagebrush, other mountain orush species, and grasses. On carbonates above 9,500 feet elevation: bristlecone pine. Limestone outcrops: curlleaf mountain- mahogany. Limited areas of alpine meadows or tundra.	recreation. Limited numbers of Bonneville cutthroat trout inhabit streams in and near Great Basin National Park.	14b. Arid Footslopes 4133	3 Alluvial fans, hills, basalt flows, and low mountains drained by ephemeral streams, springs, and washes. Storm events produce high sediment yields. Reliable surface water is scarce Mostly 2800-6200; maximum 7200/ 2000	Quaternary colluvium and alluvium. Tertiary extrusive rocks and conglomera Jurassic siltstone, sandstone, carbonates, and shale. Triassic limestone, siltstone, so	Mostly Entisols (Torriorthents); also Aridisols (Argidurids, Haplocalcids, Haleburu, Zibate,	Mostly 4-8 180 Thermic/ Aridic, Aridic bordering on	0-260 20/54; 58/100	A diverse mixture of Mojavean forbs, shrubs, and succulents/ Scattered creosote bush, white bursage, Joshua trees and other yuccas, blackbrush, winterfat, spiny menodora, Nevada ephedra, big galleta, Indian ricegrass, and annual fescue. On rocky sites: cacti	southwestern willow flycatcher. Open, multi-layered shrubland, rangeland, wildlife habitat, recreation, and military reservations. Many reptile species occur. Upland areas support bighorn sheep. Historic gold and silver mining and nuclear testing. Active sand and gravel mines are found near Las Vegas and gold mines occur near Beatty.
13g. Wetlands	410 Flat to depressional terrain with saline, brackish, or freshwater wetlands. Some wetlands are perennial and are maintained by spring and groundwater flow. Others are ephemeral and are dependent on snow-melt from mountains:	3850-6100/ Quaternary playa, marsh, and alluvial deposits.	Inceptisols (Halaquepts), Mollisols (Endoaquolls), Aridisols (Aquisalids)	Equis, Paranat, Parran, Yobe	Mesic/ Aridic, Aridic bordering on Xeric, Aquic	4-10 90-130	48/94; 10/44	Fule marshes/ Bulrushes, Baltic rush, cattails, burreed, reed grass (except in the Lahontan basin), inland saltgrass, alkali sacaton, fuckweed, widgeongrass, and iodine bush. The non-native tamarisk ree has become common in many areas. Wetlands typically contain ardstem and alkali bulrushes on the margins of water areas more	Marshland, wildlife habitat, rangeland, cropland, and recreation. Water, marsh, and shore birds are common. Several state wildlife management areas and federal wildlife refuges occur. Marshes near Ruby Lake are critical trout and bass habitat and contain relict dace. Farmland, home sites, and channelization have reduced wetland acreage. Reclamation projects and irrigation seenage have created new		or nonexistent. 200-2000	sandstone. Pennsylvanian-Mississippian limestone. Devonian carbonates. Ordovician carbonates and shale. Cambr carbonates and shale. Precambrian gneis schist, and granitics. Rock outcrops occu	ian s, r.	Usuc		abundant when sufficient winter precipitation is received.	
	they are susceptible to droughts and can dry up seasonally. Ditches and dikes regulate water levels in many wetlands.							than 6 feet deep and cattails in water 3 to 6 feet deep. Shallow areas (1 to 12 inches) usually contain no vegetation or inland saltgrass (in saline conditions) or duckweed and widgeongrass (in less alkaline conditions).	wetlands. Wetland water quality varies and depends upon season and amount of irrigation return flow. Wetlands in Lahontan Valley and near Humboldt Lake are at the terminus of rivers; they receive return flow from flood-irrigated fields which, in turn, degrades water quality.	14c. Mojave594MountainWoodland and	4Mid-elevation mountain slopes, ridges, and hills drained by ephemeral streams, springs, and washes. Storm events produce high sediment yields. Reliable surface water is scarce or6000-8000/ 400-2000	Quaternary colluvium. Triassic siltstone, limestone, and conglomerate. Pennsylvanian limestone. Mississippian limestone. Devonian dolomite and	Mollisols (Haplustolls), Entisols (Ustorthents), Aridisols (Haplargids, Haplocalcids) Schader	Mesic, Frigid/ 10-16 90 Aridic bordering on Ustic, Aridic	0-150 26/46; 62/86	Juniper–pinyon woodland/ Singleleaf pinyon, juniper, Gambel oak, curlleaf mountain-mahogany, cliffrose, Wyoming big sagebrush, black sagebrush, serviceberry, snowberry, manzanita, ceanothus, silktassel, and Apache plume. Above 7,500 feet elevation: Utah	Woodland, brushland, rangeland, recreation, and wildlife habitat containing Mojavean fauna. Recreational use is especially heavy in the Spring Mountains east of Pahrump. Historic gold and silver mining. Active gold mines are found south of Las Vegas.
13h. Lahontan and Tonopah Playas	 Broad, nearly level alkali flats, mud flats, playas, lake plains, low terraces, paleobeaches, sand dunes, and sand sheets. Isolated springs support small wetlands. Saline lakes and marshes occur. Water levels fluctuate seasonally and from year-to-year. Water is more alkaline than in higher elevation ecoregions. Playas are ponded by 	3350-5500/ 0-50; commonly nearly levelMostly Quaternary playa, marsh, and alluvial deposits; also Quaternary aeolian material. Once drowned by Lake Lahontan and smaller, more ancient lakes in the Tonopah area. Strongly alkaline, clayey- silty lacustrine sediments occur.	Inceptisols (Halaquepts), Entisols (Torriorthents, Torrifluvents, Torripsamments), Aridisols (Natrargids)	Mostly playa; also Wendane, Mazuma, Slaw, Sondoa, Isolde, Wabuska, Lahontan, Voltaire, Ragtown, Appian, Bubus. Soils are often strongly	Mesic/ Aridic	4-8 100-160	12/48; 48/96	Mostly barren; also saltbush–greasewood/ Vegetation is mostly absent. Only some scattered, extremely salt-tolerant plants such as alkali sacaton, inland saltgrass, and seepweed occur. Black greasewood or four-winged saltbush may grow in the transition to the salt shrub community and often stabilize low sand dunes.	Mostly barren. Wildlife habitat, recreation, and military reservation. Very limited grazing potential and largely unsuitable as cropland. Historic placer gold mining along playa shorelines. Pyramid Lake, the terminus of the Truckee River, provides the only habitat for the federally-endangered cui-ui sucker fish and also contains lake dwelling populations of federally-threatened Lahontan cutthroat trout.	Shrubland14d. Mojave High110Elevation110	nonexistent. There are no perennial streams.) Unglaciated, rugged, isolated, high elevation mountains. Dry washes are common even at high slow-3900	limestone. Silurian dolomite. Ordovician dolomite and limestone. Cambrian limestone and quartzite. Precambrian gneiss, schist, granitic rocks, and quartzi Quaternary colluvium. Pennsylvanian limestone. Mississippian limestone.	te. Inceptisols (Eutrocryepts), Multicele (Leghertelle	e, Cryic, Frigid/ 16-25+. Les Mostly Aridic Precipitation 50	ss than 24/41; 0-100 55/78	juniper is replaced by Rocky Mountain juniper. Highest elevations: mountain brush. On soils derived from carbonate rocks: cliffrose. Canyons: ponderosa pine, Gambel oak, willow, black cottonwood, serviceberry, snowberry, and manzanita. Great Basin pine forest/ Curlleaf mountain-mahogany, mountain big sagebrush, and both ponderosa pine and white fir forests.	Lower slopes: shrubland and brushland. Upper slopes: forests. Woodland grazing, recreation, firewood gathering, and wildlife habitat.
13j. Lahontan Salt Shrub Basin	 runoff from higher areas during wet intervals and eroded by wind when dry. 9600 Rolling plains with alluvial fans, scattered hills and buttes, foothills, stream terraces, flood plains, 	Mostly Mostly Quaternary alluvial, lacustrine, 3400-5500/ playa, marsh, aeolian, and colluvial	Entisols (Torriorthents, Torripsamments,	saline and alkaline. Ricert, Stumble, Hawsley, Mazuma,	Mesic/ Aridic, Aridic	4-7 100-160. Affected	12/46; 52/94	Saltbush–greasewood/ Shadscale, bud sagebrush, Bailey greasewood, Shockley desert thorn, Indian ricegrass, and Nevada	Shrubland, rangeland, wildlife habitat, irrigated alfalfa and small grain farming, urban areas, irrigated pastureland, and military reservations. Historic gold and silver	Mountains	Water is primarily from snow-melt.	Rock outcrops are common.	Calciustolls), Entisols (Cryorthents)	Ustic, Aridic bordering on Xeric		north- and east-facing slopes and in hollows: small aspen groves. Geographic and climatic isolation is pronounced allowing new plant species to evolve and relict populations to persist. Many rare and endemic species occur.	
	and sand sheets in internally drained basins. Active and vegetation-stabilized sand dunes are sometimes found on the lee side of physiographic barriers. Perennial, intermittent, and ephemeral streams occur. Medium-gradient streams have riffle sections with cobble substrates. Low- gradient streams are generally sediment laden. Surface water is usually more alkaline than in nearby higher elevation ecoregions.	Mostly 50- 400. Hills and buttes: higher and more rugged deposits. Lower areas were once drowned by late Pleistocene pluvial lake systems. Tertiary basaltic, andesitic, rhyolitic, and tuffaceous rocks often underlie hills.	Xerofluvents, Torrifluvents), Aridisols (Natrargids), Mollisols (Haploxerolls, Endoaquolls), Inceptisols (Halaquepts)	Blacktop, Dia, Izo, Lahontan, Voltaire, Wabuska, Dithod, Fallon, Weena. Fine soils derived from lacustrine sediment are common and can be saline and alkaline.	bordering on Xeric	by inversions.		ephedra are common. On strongly saline and sodic areas: black greasewood, inland saltgrass, alkali sacaton, and seepweed. Dunes: specialized plants including indigobush, four-wing saltbush, ittleleaf horsebrush, dune horsebrush, and Indian ricegrass. Riparian woodland: Frémont cottonwood, coyote willow, silver buffaloberry, and Russian olive along major rivers.	mining. Active gold, limestone, sand, and gravel mining. Dunes retain moisture and support a relatively dense animal community. Streams have been diverted for irrigation use, thereby reducing stream flow. Water quality has been moderately- to heavily-degraded by human activities. Stream diversions for agriculture and evaporation have elevated dissolved salt concentrations in Walker Lake, endangering its fresh water fishery. The federally-threatened Lahontan cutthroat trout once thrived in the Lahontan Basin but most populations have now been extirpated. The federally- threatened desert dace is found in spring-fed areas near Soldier Meadows in western Humboldt County.	14e. Arid Valleys and Canyonlands	5 Arid canyons, benchlands, alluvial fans, terraces, and floodplains in the Colorado River corridor. Upland erosion potential is high. Concentrations of total dissolved solids and calcium carbonate in streams are also high. Mostly 500-2000; maximum 3400/ 100-2300	Quaternary alluvium and colluvium. Tertiary andesitic rocks, basalt, tuffaceou sedimentary rocks, intrusive rocks, and continental sedimentary rocks. Precambr gneiss, schist, and granitic rocks. Rock outcrops occur.	Aridisols (Haplocalcids, Haplodurids, (Torriorthents) (Torriorthents) (Aridisols (Haplocalcids, Haplogypsids), Entisols (Torriorthents) (Torriorthents) (Torriorthents) (Torriorthents) (Torriorthents) (Torriorthents) (Torriorthents) (Torriorthents) (Torriorthents) (Torriorthents)	Hyperthermic, 2-7 200 Thermic/ Aridic d	0-350 28/60; 68/110	Creosote bush/ Creosote bush, white brittlebush, white bursage, mesquite, palo verde, and occasional Sonoran species such as ocotillo. Below 1,000 feet elevation: no white bursage. Along larger rivers: native riparian plants, such as Frémont cottonwood and willow, are being replaced by introduced tamarisk.	Diverse, sparse shrubland, wildlife habitat, rangeland, and recreation. Historic gold and silver mining. Active sand and gravel mining operations are found near Las Vegas. Upland habitats support bighorn sheep. In many canyons, cold water fisheries occur. The razorback sucker, Colorado pikeminnow, humpback chub, bonytail chub, and woundfin are all associated with the Colorado River and are all federally- endangered due to the introduction of non-native fish and the alteration of natural habitat (including dams and diversions). The federally-endangered Moapa dace and Virgin River chub are both found in the Muddy River and the latter is also found in the Virgin River, Riparian habitats support non-native fish such as largemouth bass
13k. Lahontan Sagebrush Slopes	4766 Hills, upper alluvial fans, bajadas, and low mountain slopes. Perennial, intermittent, and ephemeral streams occur.	Mostly 4800-7000; minimum 4300, maximum 8700/Quaternary alluvium and colluvium. Tertiary basalt, andesite, rhyolite, and tuffaceous rocks. Jurassic gabbro, basalt, siltstone, shale, sandstone, and carbonates. Cretaceous granitics. Triassic volcanics, breccia, and limestone. Permian chert, argillite, and shale. Ordovician siliceous	Aridisols (Haplargids, Haplodurids), Mollisols (Argixerolls)	Theon, Old Camp, Olac, Roca, Acrelane, Vanwyper, Wylo, Shawave, Grumblen, Boomstick, Bliss, Perla	Mesic/ Aridic bordering on Xeric, Aridic	6-12. 80-140 Sierran rainshadow influence is strong.	12/46; 52/92	Great Basin sagebrush community and sagebrush steppe/ Wyoming big sagebrush, Lahontan sagebrush, low sagebrush, littleleaf norsebrush, rabbitbrush, antelope bitterbrush, green ephedra, desert needlegrass, bottlebrush squirreltail, Thurber needlegrass, Indian ricegrass, Sandberg bluegrass, and bluebunch wheatgrass. Understory grasses increase in productivity toward the northeast. Introduced cheatgrass tends to replace the shrub community and	Shrub- and grass-covered. Wildlife habitat, recreation, and active gold, silver, clay, limestone, and gypsum mines. Extensive historic gold and mercury mining. Limited grazing potential; livestock grazing has reduced native grasses and biological soil crusts. Stream flows are generally diverted for agriculture before reaching main stem rivers. Water quality is moderately- to heavily-degraded by human activities. Includes both cold water fisheries and warm water fisheries.	14f. Mojave Playas 88	Broad, nearly level alluvial flats, muddy lake plains, low terraces, sand sheets, and sand dunes. Intermittent saline lakes occur, episodically filling to support a large invertebrate fauna. 1950-3400/ 0-50; commonly nearly level	Mostly Quaternary playa, marsh, aeolian and alluvial deposits.	, Entisols (Torripsamments, Torriorthents), Aridisols (Haplocalcids)	t Aridic 4-7 170	0-300 20/56; 60/102	Mostly barren; also creosote bush/ Vegetation is mostly absent but scattered, extremely salt-tolerant plants occur. Cold-intolerant trees and woody legumes, such as velvet ash and mesquite, sometimes are found where there is sufficient moisture, particularly toward the south. Locally, scattered creosote bush.	black crappie, channel catfish, rainbow trout, striper bass, and carp. Mostly barren. Wildlife habitat. Very limited grazing potential. Unsuitable as cropland.
131. Lahontan Unlands	855 Low fault block mountains. Perennial and intermittent streams are fed by springs and snow-	and volcanic rocks. Cambrian sandstone, shale and limestone. Rock outcrops occur.Mostly 6400-8800;Quaternary colluvium. Tertiary basalt and tuff. Jurassic shale, siltstone, sandstone,	Entisols (Torriorthents), Mollisols (Argixerolls,	Kram, Jobpeak, Hopeka, Sumine,	Mesic, Frigid/ Aridic	10-16 60-110	16/39; 51/86	Mostly juniper steppe woodland/ Open stands of woodland dominated by Utah juniper occur. Singleleaf pinyon occurs only on	Woodland, shrubland, and grassland, rangeland, and wildlife habitat. Streams are used by fish for spawning, rearing, and/or migration. Includes streams that have been	14g. Amargosa Desert 1691	1 Nearly level to rolling, internally drained valleys that receive discharge from extensive underground water systems. Contains floodplains, terraces, playas, sand sheets, sand dunes, lower alluvial fars, and scattered hills. Many hot Mostly 2000-4200; isolated hills to 6000/ to 6000/ Mostly less	Valleys: Mostly Quaternary alluvium; some Quaternary playa, marsh, and alluv flat deposits. Scattered hills: Tertiary ash-flow tuffs, tuffaceous sedimentary rocks and thyolitic flows: Devonian	rial Entisols (Torriorthents), Aridisols (Haplocalcids, Haplodurids) Arizo, Yermo, Shamock, Sanwell. Scattered hills: St. Thomas, Nickel	Thermic/ 3-7. 180 Aridic Precipitation maximum in winter. In the rainshadow	0-300 26/60; 64/104	Creosote bush/ Creosote bush, white bursage, wolfberry, shadscale, scattered Joshua trees and other yuccas, Indian ricegrass, and forbs. Wetland oases occur where the Amargosa River surfaces and support many endemic plants. Amargosa River meadows are dominated by inland saltgrass. The Ash Meadows area supports	Shrubland, rangeland, wildlife habitat, home sites, recreation, dairy operations, feed lots, and irrigated cropland growing alfalfa, sorghum, and pistachios. Historic gold and silver mining. Active sand, gravel, clay, and gold mining occur. Seeps and springs support endemic fish species. The Ash Meadows area supports threatened and endangered endemic fish species such as Ash Meadows Amargosa punfish. Ash
	melt. Summer stream flow is generally low.	minimum 5500, maximum 9800/and carbonates. Triassic granite, andesite, rhyolite, and sandstone. Pennsylvanian conglomerate, limestone, sandstone, and calcareous shale. Ordovician siliceous and volcanic rocks. Cambrian sandstone. Rock outcrops are common.	Haploxerolls), Aridisols (Haplargids)	Tristan, Acrelane, Duco, Roca, Reluctan, Golsum, Say, Old Camp, Belate, Glean, Ister	bordering on Xeric			Fairview Peak and in the Stillwater Range. Understory is composed of mountain big sagebrush, Wyoming big sagebrush, black sagebrush, low sagebrush, green ephedra, antelope bitterbrush, and rabbitbrush. Northern herbaceous layer: cool season grasses such as Sandberg bluegrass, Thurber needlegrass, and bluebunch wheatgrass. Southern herbaceous layer: warm season grasses such as Indian ricegrass. Riparian vegetation can be lacking.	state-designated for protection as critical or high priority fishery habitat. Historic gold, silver, and mercury mining. Active gold mines are now reworking old mine areas.		and cold springs in the Amargosa Valley. Both intermittent and ephemeral washes and streams occur and commonly have subsurface flow. Many seeps and springs feed intermittent rivers and streams.	dolomite and limestone; Silurian dolomi Cambrian limestone, dolomite, and shale Precambrian quartzite, phyllitic siltstone conglomerate, limestone, and dolomite.	te. 2.	of the Spring Mountains.		many endemic plants such as Ash Meadows gumplant, Amargosa niterwort, Ash Meadows blazing star, Ash Meadows ivesia, and Ash Meadows milkvetch.	Meadows speckled dace, Warm Springs pupfish, and Devils Hole pupfish.
13m. Upper Humboldt Plains	5245 Broad, rolling plains with scattered buttes, hills, alluvial fans, foothills, and a few hot springs. Perennial or intermittent streams generally drain into the Humboldt River. Stream gradients are	4600-7700/ 200-2000Quaternary alluvial and lake deposits. Mostly Tertiary tuffaceous rocks, ash, and andesitic, rhyolitic, and basaltic rocks.	Aridisols (Haplargids, Haplocambids, Argidurids), Mollisols (Argixerolls,	Hunnton, Vanwyper, Enko, Cleavage, Orovada, Wieland, Stampede, Donna,	Frigid, Mesic/ Aridic bordering on Xeric	8-16 70-120	6/40; 46/94	Great Basin sagebrush community and sagebrush steppe/ Wyoming big sagebrush, Douglas rabbitbrush, bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, bottlebrush squirreltail, bluebunch wheatgrass, Thurber needlegrass, and Great Basin wildrye. On	Shrub- and grass-covered. Mostly rangeland; some cropland especially near the Humboldt River. Grazing has affected sagebrush communities by reducing native grasses and biological soil crusts. Historic gold, silver, and mercury mining predominantly in the west. Today, mines are active in the Elko and Carlin areas.				T				
	variable. High-gradient streams have many riffle sections with cobble substrates. Lower gradient streams have fewer riffles and finer substrates. Stream flows vary seasonally.		Durixerolls)	Cotant, Roca, Trunk, Ninemile, Brock, Ramires. Extensive shallow, stony soils occur. Soils derived				shallow soils: low sagebrush. On soils derived from rhyolite: density of grass and forb species in the sagebrush understory tends to be higher than on soils derived from other rocks. Lightning fires are common; cheatgrass tends to replace native grasses and shrubs ofter fire	The Upper Humboldt River has been moderately- to heavily-degraded by human activities. Tributary water quality has been lightly- to moderately-degraded by human activities. The Humboldt River contains largemouth and smallmouth black bass, channel catfish, black bullhead, and carp. Some higher elevation tributaries contain the Columbia spotted frog and the federally-endangered Laboran cutthroat	Level IV Ecoregions	Physiography	Geology	Soils	Cl	limate	Potential Natural Vegetation*/ Present Vegetation	Land Cover and Land Use
13n Mid Floyation	467 Partly glaciated mid-elevation mountains and	6500-8500/ Quaternary colluvial and morainal deposits	Mollicols (Argiverolls	from rhyolite have a relatively high moisture content.	Frigid Cryic/	12-22+ 60-110	15/35:	luniper_pinyon woodland/ Mid_elevations: mostly singleleaf	trout. Other tributaries to the Humboldt River support a fishery containing rainbow trout, brook trout, brown trout, and mountain whitefish.	Area (squa miles) 22d. Middle Elevation	Elevation/ Local Relief (feet) b Dissected, rugged, middle elevation mountains, 4000-8066/	Surficial and Bedrock Quaternary colluvium. Mostly Precambr	ian Mollisols (Haplustolls), Seralin, Virgin Peak	s Temperature/ Precipitation Mean annual (inches) (d.	st Free n annual days) January min/max; July min/max (°F) 0-180 27/47;	*Source: Kuchler, 1964 Chaparral and juniper-pinyon woodland/ Between about 5,750 and	Brushland, woodland, scattered forest, rangeland, and wildlife habitat.
130. High Elevation	 123 Heavily glaciated, high elevation mountains 123 Heavily glaciated, high elevation mountains 	600-2000 Quaternary colluvial and motion and metamorphic rocks; also Paleozoic sedimentary rocks and Precambrian metasedimentary and sedimentary rocks. 8500-11350/ Quaternary colluvial, morainal, and	Mollisols (Argicryolls, Haploxerolls)	Cropper, Hapgood, Bullump, Segura, Quarz Hackwood, Topeki,	Aridic bordering on Xeric, Xeric	Receives winter rainfall. 20-26+. 15-80	16/34;	Sandberg bluegrass, and bluebunch wheatgrass. Higher elevations: Surleaf mountain-mahogany and aspen groves. Bottoms: aspen and cottonwood. Western slopes of the Ruby Mountains: mostly sagebrush and mountain brush; only limited pinyon and juniper. Great Basin pine forest community/ Scattered white fir, limber pine,	zinc mining. Water quality is only lightly influenced by human activities. Many streams have been state-designated for protection as critical or high priority fishery habitat. The federally-threatened Lahontan cutthroat trout occurs in some streams.	Mountains	steep ridges, mesas, buttes, and canyons. 600-3000	gneiss and schist. In the south: Permian limestone, Pennsylvanian limestone, Mississippian limestone, Devonian dolomite and limestone, and Cambrian limestone, dolomite, sandstone, quartzite and shale. Rock outcrops occur.	Entisols (Torriorthents), Aridisols (Haplargids), Inceptisols (Eutrocryepts) ,	o, Aridic bordering on Ustic	67/89	8,000 feet elevation: mountain brush above and below isolated, small stands of Rocky Mountain Douglas-fir and Rocky Mountain white fir. Between 5,000 and 5,750 feet elevation: Rocky Mountain juniper, singleleaf pinyon, Gambel oak, Utah serviceberry, littleleaf mountain-mahogany, curlleaf mountain-mahogany, canyon maple, manzanita, ceanothus, and grasses. Below about 5,000 feet elevation: desert scrub oak, singleleaf pinyon, Utah	
Ruby Mountains	containing cirques, tarns, boulder fields, and other glacial features. Extensive periglacial features occur including active solifluction fields. Small, clear, cold lakes and perennial streams are fed by snow-melt and springs.	600-2800 periglacial deposits. Mostly Mesozoic granitic and metamorphic rocks. Rock outcrops are common.	Haplocryolls), Alfisols (Haplocryalfs), Entisols (Cryopsamments)	Guiser, Witefels. Shallow soils are common.	Xeric, Aridic bordering on Xeric	Receives winter rainfall.	47/74	Engelmann spruce, whitebark pine and shrubs and grasses including mountain big sagebrush, low sagebrush, lupine, snowberry, curlleaf mountain-mahogany, sedges, Sandberg bluegrass, and Idaho fescue. Little closed-canopy conifer forest occurs. Extensive aspen groves. Alpine tundra occurs on thin, poorly drained soils over impervious rocks. Rocky Mountain flora is dominant.	wildlife habitat, and recreation. Includes designated wilderness. Water is only lightly influenced by human activities. High mountain lakes contain brook trout, Lahontan cutthroat trout, and lake trout.							juniper, and shrublands. On limestone: black sagebrush is common in understory. On gneiss and schist: Wyoming big sagebrush is common in understory.	
13p. Carbonate Sagebrush Valleys	 Figure 11 and the start of the	5300-7000; scattered hills, ridges, and buttes to basins and terraces: Quaternary alluvium. Hills, ridges, and buttes: Tertiary rhyolitic, andesitic, sedimentary, and granitic rocks and tuffs. Mesozoic granitic rocks. Paleozoic sedimentary rocks dominated by	Argidurids, Haplodurids, Argidurids, Haplargids, Haplocambids), Entisols (Torriorthents, Torrifluvents)	Blimo, Abgese, Wiffo, Umil, Kobeh, Dewar, Enko, Hunnton, Alhambra.	Aridic Aridic bordering on Xeric	Receives summer rainfall.	10/44; 48/92	A mixture of sparse, carbonate- and drought-tolerant shrubs including black sagebrush, winterfat, Wyoming big sagebrush, and rabbitbrush. The understory is composed of grasses including bottlebrush squirreltail, Indian ricegrass, bluebunch wheatgrass, and cheatgrass. In north: cool	irrigated alfalfa, and small grain farming. Livestock grazing has reduced native grasses and biological soil crusts. Stream diversions for agriculture are common. Stream quality has been heavily- to moderately-degraded by human activities. Water from springs in the upper portions of White River Valley provide downstream	80.	NORTHERN BASIN AN	D RANGE				T	
	Stream flow is variable. Riffle sections have substrates composed of cobble-size or finer material. A few hot springs occur.	7600/ 50-1000 limestone and dolomite.		Hard pan can limit root growth.				season grasses. In south: warm season grasses occur with increasing summer rain. In Spring Valley: winterfat.	habitat to endemic fishes such as the Preston White River springfish, White River speckled dace, White River desert sucker, and the federally-endangered White River spinedace. Echo Canyon Reservoir east of Pioche contains the endemic Meadow Valley Wash speckled dace and Meadow Valley desert sucker fish. The federally- threatened and endemic Big Spring spinedace is found near Panace	Level IV Ecoregions	Physiography Elevation/ Local Relief (fact)	Geology Surficial and Bedrock	Soils Order (Great Group) Common Soil Serie	s Temperature/ Precipitation From Moisture Mean annual Mear Programs (inches)	limate st Free Mean Temperature n annual January min/max; January min/max;	Potential Natural Vegetation*/ Present Vegetation *Source: Kuchler, 1964	Land Cover and Land Use
13q. Carbonate Woodland Zone	6497 Mid-elevation moderately to steeply sloping mountains and ridges. Underground drainage is common and many springs occur. Its moderate- to high-gradient, cold, perennial or intermittent streams are fed by snow-melt and springs. Stream flows vary seasonally.	Mostly 6000-9000; minimum 5400, maximum 9400/ 300-3000Quaternary colluvium and alluvium. Mostly Paleozoic sedimentary rocks dominated by limestone and dolomite. Also Tertiary rhyolitic, andesitic, and granitic rocks and tuffs, Mesozoic granitic rocks, and Precambrian metasedimentary and sedimentary rocks. Rock outcrops are common.	Entisols (Torriorthents), Mollisols (Calcixerolls, Argixerolls, Haploxerolls, Argicryolls, Calcicryolls, Haplocryolls), Aridisols (Haplargids,	Zimbob, Hopeka, Hyzen, Cavehill, Pookaloo, Cropper, Fera, Locane, Ravenswood, Bartine, Fusulina, Tica	Mostly Frigid; also some Cryic/ Aridic bordering on Xeric	9-15. 60-110 Receives summer rainfall.	15/38; 51/84	Mostly juniper–pinyon woodland; also some Great Basin sagebrush community/ Singleleaf pinyon and/or Utah juniper with a diverse understory of black sagebrush, Wyoming big sagebrush, mountain big sagebrush, littleleaf mahogany, curlleaf mountain-mahogany, cliffrose, green ephedra, bluebunch wheatgrass, Idaho fescue, pine bluegrass, and bottlebrush squirreltail. In north: cool season grasses. In south: warm season grasses. Pinyon decreases to the north.	 Woodland, shrubland, rangeland, wildlife habitat, and recreation. Woodlands were cleared to increase livestock forage and were also widely cleared for charcoal production between 1870 and 1900. Woodland has since recovered and is expanding into lower elevation sagebrush areas. Historic gold mining. Active mining is found near Ely, Eureka, and Pioche. Water quality has been lightly- to moderately-degraded by human activities. Some streams have been state-designated for protection as critical or high priority fishery habitat. 	80a. Dissected High Lava Plateau 353	 Rolling, high volcanic plateaus dissected by deep, shear-walled canyons. Perennial, ephemeral, or intermittent streams, rivers, and reservoirs are fed by snow-melt and springs. Stream gradients, substrates, and seasonal flows vary. Some streams (e.g. Salmon Falls Creek) have medium- to high-gradients and cobble substrates. Others, including the Owyhee River 	Mostly Quaternary alluvium and Tertiary basalt and tuffaceous sedimentary rock. Some Quaternary playa and marsh depos and Tertiary rhyolitic and andesitic rocks and tuffs.	Aridisols (Haplodurids, Argidurids, Haplargids, Haplocambids), Durixerolls) Argidurids, Haplargids, Haplocambids), Durixerolls) Argidurids, Haplargids, Haplocambids), Argidurids, Haplargids, Dewar, Chuska, Jackpot, Enko, Ackett, Stampede, Donna, Orovada	Mesic, Frigid/ Mostly Aridic bordering on Xeric)-120 10/38; 46/90	Mostly sagebrush steppe/ Wyoming big sagebrush, low sagebrush, Douglas rabbitbrush, bluebunch wheatgrass, Idaho fescue, bottlebrush squirreltail, Sandberg bluegrass, Thurber needlegrass, Indian ricegrass, and cheatgrass. Overgrazed areas: cheatgrass has replaced depleted bunchgrasses. In rocky areas: black sagebrush and scattered junipers.	Shrub- and grass-covered. Primarily rangeland and wildlife habitat. Some irrigated pastureland and alfalfa, barley, and oat farming. At lower elevations, many stream diversions for agriculture. Active sand and gravel mining operations are found south of Jackpot. In general, water quality is lightly- to moderately-influenced by human activities. Concentrations of total dissolved solids and total suspended solids are low. Contains streams that have been state-designated for protection as critical or high priority fishery habitat. The South Fork Owyhee River has a warm water fishery. Other streams can support cold water fisheries. Yellowstone cutthroat trout occur in
13r. Central Nevada High Valleys	7629 Rolling to hilly, high elevation valleys. Level ground is limited due to the encroachment of alluvial fans. Eroded gullies are common and permanent lakes are absent. Spring- and mountain-fed streams flow into the ecoregion but may be intermittent. Low-gradient streams with few riffles occur. Substrates are composed of fine	Mostly 5000-7000; minimum 4200, maximum 8000/ 100-2000Mostly Quaternary alluvium and Tertiary silicic ash-flow tuffs. Also Quaternary loess, lacustrine deposits, and colluvium and Mesozoic volcanic and granitic rocks. Rock outcrops occur.	Entisols (Torriorthents), Aridisols (Haplargids, Haplocalcids, Haplocambids)	Tulase, Hayeston, Armespan, McConnel, Old Camp, Singatse, Pineval, Stewval, Jung, Buffaran, Rebel, Silverado.	Mesic, Frigid/ Aridic bordering on Xeric	8-10 80-120	12/44; 48/94	Mostly Great Basin sagebrush community/ Wyoming big sagebrush black sagebrush, shadscale, low Douglas rabbitbrush, littleleaf norsebrush, green ephedra, galleta, needleandthread, Indian ricegrass, bottlebrush squirreltail, Thurber needlegrass, Sandberg bluegrass, and cheatgrass. Valley bottoms: Wyoming big sagebrush and associated grasses. Riparian habitat is generally lacking. Volcanic hills and alluvial fans: black sagebrush.	, Shrubland, grassland, rangeland, wildlife habitat, and some irrigated cropland principally growing alfalfa. Rangeland can be heavily grazed. Stream diversions for agriculture are common. Springs support endemic fish including the Monitor Valley speckled dace. Resident populations of cold water, threatened and endangered fish including Lahontan cutthroat trout are associated with the Reese River and Edwards Creek drainages.	80b. Semiarid Hills and Low Mountains	system, have low- to medium-gradients and cobble or pebble substrates. 1 Hills, low mountains, and alluvial fans. Low- to moderate-gradient, perennial, intermittent, or ephemeral streams occur. Riffle segments are common. Stream flows are seasonally variable. 5800-8300/400-2300	Quaternary alluvium. Tertiary extrusives and tuffaceous sedimentary rock. Jurassi granitics. Triassic siltstones. Paleozoic carbonates, shale, sandstone, conglomera and quartzite. Rock outcrops occur.	Mollisols (Argixerolls, Haploxerolls), Aridisols (Haplocalcids), Entisols (Xerorthents)Gollaher, Cleavage, Xica, Shalcleav, Tecomar, Kram, Sumine, Amtoft, Ridgecrest	Frigid, Mesic/ 10-20 50 Aridic bordering on Xeric, Xeric)-110 15/35; 49/83	Mostly sagebrush steppe and juniper–pinyon woodland/ Mountain big sagebrush, low sagebrush, scattered Utah juniper, bluebunch wheatgrass, Sandberg bluegrass, Great Basin wildrye, and Indian ricegrass. Above about 7,000 feet: mountain brush. On alluvial fans: aspen groves. Riparian areas: aspen, Geyer willow, and Booth	the Goose Creek drainage. Shrubland, grassland, woodland, rangeland, and wildlife habitat. Includes streams that have been state-designated for protection as critical or high priority fishery habitat. Water quality has been lightly- to moderately-degraded by human activities. Historic gold mining occurred Montello. Yellowstone cutthroat trout occur in the Goose Creek drainage.
13s. Central Nevada Mid-Slope Woodland and Brushland	sediment. 3586 Mid-elevation mountain side slopes and summits. Its perennial or intermittent, moderate-gradient streams are fed by snow-melt and cold springs.	Mostly 6500-8000; minimum 6000, maximum 8500/	Entisols (Torriorthents), Mollisols (Argixerolls, Haplocryolls)	Coils, Bucan Itca, Bellehelen, Hopeka, Sumine, Ravenswood	Frigid, Mesic, Cryic/ Aridic bordering on Xeric	12-18 60 -110	17/40; 50/84	Juniper-pinyon woodland and mountain-mahogany/ Singleleaf pinyon, Utah juniper, black sagebrush, Wyoming big sagebrush, green ephedra, rabbitbrush, desert bitterbrush, Thurber needlegrass, Sandberg bluegrass, bluebunch wheatgrass, Idaho fescue, and cheatgrass. Overall, woodland is more limited than in other mid- playetime.	Discontinuous open woodland, shrubland, rangeland, wildlife habitat, and recreation. Pinyon and juniper were widely cleared for charcoal production between 1870 and 1900. Woodland has recovered, expanding into lower elevation sagebrush areas. Many stream diversions for agriculture occur. Extensive historic gold and silver mines. Active mining near Manhattan and Austin. Water quality is lightly- to heavily- influenced by the sector.	80d. Pluvial Lake Basins 342	2 Nearly level to gently sloping, internally drained basins containing lake terraces, playas, beach plains, stream terraces, intermittent lakes, fan skirts, and cool springs. Reliable surface water is limited; water levels fluctuate seasonally and from year-to-year. 4600-6200/ Less than 50-400	Quaternary lacustrine, playa, alluvium, a marsh deposits.	nd Entisols (Torriorthents), Aridisols (Natrargids, Paleargids, Haplocambids, Natridurids) Mazuma, Longdis, Dugway, Spangenburg, Disabel, Enko, Updike	Mesic, Frigid/ Mostly Aridic bordering on Xeric	0-130 16/38; 48/86	Sagebrush steppe/ Wyoming big sagebrush, basin big sagebrush, rubber rabbitbrush, Great Basin wildrye, bottlebrush squirreltail, Indian ricegrass, Sandberg bluegrass, Thurber needlegrass, and cheatgrass. In strongly saline and sodic areas: black greasewood, inland saltgrass, and seepweed.	Shrub- and grass-covered. Mostly rangeland and wildlife habitat; some recreation, irrigated pastureland, and irrigated cropland growing alfalfa. Water diversions for agriculture occur. Occasional vernal pool species are found near seasonal fresh-water bodies.
13t. Central Nevada Bald Mountains	1221 High elevation, moderately to steeply sloping mountains and ridges. Contains moderate- to high-gradient headwater streams that are fed by	 8500/ 400-2000 and chert. Silurian dolomite. Ordovician carbonates, chert, phyllite, quartzite, and shale. Cambrian quartzite, sandstone, and limestone. Rock outcrops are common. 7500-11000/ 600-3500 Quaternary colluvium. Tertiary extrusive rocks. Triassic conglomerate, limestone, and siltstone. Permian chert areillite and 	Mollisols (Argicryolls, Haplocryolls, Palecryolls	Hapgood, Layview, Packer, Foxvire, Elveare, Podmor	Cryic, Frigid/ Xeric, Aridic bordering on	14-25+ Less than 50-90	18/38; 48/78	All the sagebrush and curlleaf mountain big sagebrush and curlleaf mountain-mahogany. Rocky, shallow soils: woodland with little or no shrub understory. Riparian areas: cottonwood, aspen, water birch, chokecherry, and coyote willow. Mostly mountain-mahogany/ Mountain big sagebrush, low sagebrush, bitterbrush, snowberry, curlleaf mountain-mahogany, western serviceberry. Sandberg bluegrass. Idaho fescue, mountain	 Influenced by human activities. Water temperatures vary and a variety of warm water and cold water fisheries occur. Resident populations of cold water, threatened and endangered fish including Lahontan cutthroat trout are associated with the Reese River drainage. Available riparian habitat may contain the Columbia spotted frog. Brushland, shrubland, summer rangeland, wildlife habitat, recreation, and mining. Because of fire, aridity, and dense shrub cover, trees have not reestablished after early settlement mining and logging. Stream discharge and water quality are 	80e. High Desert 56 Wetlands	Valley containing remnant wetlands, floodplains, alluvial terraces, lakes, and reservoirs. Its perennial or ephemeral streams have low- to moderate-gradients.	Quaternary alluvium and lacustrine sediment.	Mollisols (Argixerolls, Haploxerolls, Endoaquolls), Alfisols (Durixeralfs, Haploxeralfs), Vertisols (Epiaquerts), Aridisols	Frigid, Mesic/ Aridic almost Xeric, Xeric. Wettest: aquic conditions in growing season.	0-110 12/36; 44/86	Sagebrush steppe/ In wettest areas: sedges, rushes, tufted hairgrass, meadow barley, creeping wildrye, and bluegrass. Elsewhere: basin big sagebrush, Wyoming big sagebrush, silver sagebrush, Idaho fescue, Great Basin wildrye, Nevada bluegrass, bluebunch wheatgrass, Thurber needlegrass, and cheatgrass.	Shrubland, grassland, wetland, rangeland, and wildlife habitat; also irrigated pastureland and irrigated cropland growing alfalfa and barley. Marshes and lakes are critical habitat for nesting and migratory birds as well as associated upland birds and mammals.
13u. Tonopah Basin	9655 Broad, nearly flat to rolling valleys containing lake plains, scattered hills, alluvial fans, bajadas,	4000-7000/ Valleys: mostly Quaternary alluvial and lacustrine deposits. Once contained several	Haploxerolls), Inceptisols (Eutrocryepts) Entisols (Torriorthents, Torripsamments),	Hackwood, Underdown family Wardenot, Koyen, Rustigate, Penoyer,	Xeric Mesic/ Aridic, Aridic	3-9. 100-170 Available	16/52; 56/96	brome, Thurber needlegrass, arrowleaf balsamroot. Highest peaks: scattered limber pine and bristlecone pine. Moist sites: aspen. Crests of the Toiyabe Range: alpine grasses, Drabas, and buckwheats. Only Great Basin tree communities occur. Mostly saltbush–greasewood; some Great Basin sagebrush community/ Sparse stands of shadscale, bud sagebrush, spiny	typically only lightly influenced by human activities. Water temperatures vary and a wide range of warm water and cold water fisheries occur. Populations of the federally-threatened Lahontan cutthroat trout are associated with the Reese River and Edwards Creek drainages. Shrubland, rangeland, wildlife habitat, and some irrigated cropland growing alfalfa, small grains, potatoes, or sugar beets. Pahranagat Valley has many springs that are	80g. High Lava Plains 5740	0 Nearly level to hilly, elevated volcanic plateau with internal drainage. Scattered lakes and ephemeral pools occur and support unusual fauna assemblages. Lake and pool levels fluctuate seasonally and from year-to-year; reliable surface water is limited. Mostly 4200-6800/ Mostly 100-2500	Quaternary colluvium, alluvium, and aeolian material derived from volcanic ash. Mostly Tertiary basaltic, rhyolitic, a andesitic rocks as well as ash-flow tuffs.	Mollisols (Argixerolls, Argicryolls, Durixerolls, Haploxerolls), Aridisols (Haplargids, Argidurids, Natrargids)	Frigid, Cryic, 8-16 50 Mesic/ Aridic	0-110 12/40; 44/92	Sagebrush steppe/ Wyoming big sagebrush, low sagebrush, Lahontan sagebrush, bluebunch wheatgrass, Sandberg bluegrass, Thurber needlegrass, bottlebrush squirreltail, and Idaho fescue. In areas depleted by grazing: cheatgrass.	Shrub- and grass-covered. Mostly rangeland and wildlife habitat; some irrigated pastureland and cropland growing alfalfa, barley, and oats. Stream diversions for livestock are common. Historic gold and silver mining in the northwest. Active opal mines occur south of Denio and clay quarries are found west of McDermitt. Productive fisheries occur in small reservoirs or impoundments. Higher elevations once supported Lahontan cutthroat trout but water availability limits their present
	sand duries, and not springs. Ephemeral washes occur. Surface water comes from springs and sporadic foothill precipitation events but is generally scarce.	Hills: Tertiary andesite, basalt, silicic ash- flow tuffs, and tuffaceous sedimentary rock; Jurassic shales, silistone, andesite, rhyolite, and volcaniclastics; Devonian limestone and dolomite; Silurian dolomite. Ordovician limestone, dolomite, shale, guartzite, and volcanic rocks	Haplocambids, Haplocambids, Natridurids, Haplocalcids, Argidurids)	Tickapoo, Ardivey, Candelaria, Stonell, Papoose, Silent, Izo, Stumble, Delamar, Monte Cristo, Alko, Nuyobe, Gabbvally, Jolan, Yomba, Origita	Xeric	moisture increases toward the east and south.		hoppage, seepweed, fourwing satiousn, spiny menodora, Nevada ephedra, littleleaf horsebrush, Douglas rabbitbrush, winterfat, inland saltgrass, and alkali sacaton. Alien and toxic halogeton is common. Shrub understory contains warm season grasses including Indian ricegrass and galleta. In the western 2/3 on lower alluvial slopes: Bailey greasewood and Shockley wolfberry are widespread and often codominate. In east and south: warm desert species including blackbrush. Joshua tree, banana supeor, and aballe acetty	endangered White River springfish, Hiko White River springfish, and Pahranagat roundtail chub. Springs support endemic fish including the Railroad Valley tui chub and the federally-threatened Railroad Valley springfish. Oil and gas production occurs in Railroad Valley. Historic gold and silver mining. Today, military reservations and active gold, silver, clay, sand, gravel, limestone, and decorative stone mining operations occur in Esmeralda County.	80j. Semiarid Uplands 315	 Hills, low- and mid-elevation mountain slopes, volcanic cones, and buttes. Moderate- to high- gradient, perennial, intermittent, or ephemeral streams occur. Riffle segments often have cobble 	Quaternary colluvium. Tertiary andesite, basalt, rhyolite, and tuff. Cretaceous granitics. Jurassic shale, siltstone, sandstone. and carbonates. Upper Palace	Mollisols (Argixerolls, Haplocryolls, Argicryolls, Oic Haploxerolls). Aridisols Linkup Chad	, Frigid, Cryic, 12-18 50 Mesic/ Aridic bordering on	0-100 16/35; 48/80	Mostly juniper steppe woodland and sagebrush steppe/ Mostly mountain big sagebrush, low sagebrush, and grasses such as Idaho fescue, cheatgrass, Sandberg bluegrass, Nevada bluegrass, bluebunch wheatgrass. Great Basin wildrue, bottlebrush	ustribution. The federally-threatened Warner sucker fish lives in permanent but shallow, weedy lakes and spawns in Twelvemile Creek in northwesternmost Nevada. The Wall Canyon area supports a unique fish species, the Wall Canyon sucker. Woodland, mixed shrubland and grassland, rangeland, recreation, and wildlife habitat. Cold water fisheries occur; threatened bull trout are found in the Jarbidge River watershed and limited numbers of Lahontan cutthroat trout are found in a few drainages in the Santa Rosa Range east of McDermitt as well as in streams further
13v. Tonopah Sagebrush Foothills	2995 Foothills, hills, mesas, fans, and low mountains. Ephemeral washes are common. Surface water comes from springs and sporadic foothill precipitation events but is generally scarce.	4600-8000/ Quaternary colluvium and alluvium. 400-3000 Tertiary andesite, basalt, rhyolite, and tuffs. Jurassic granitic rocks. Mississippian shale, siltstone, sandstone, conglomerate, and limestone. Devonian carbonates	Aridisols (Haplargids, Argidurids, Haplocalcids), Entisols (Torriorthents)	Armespan, Stewval, Gabbvally, Zadvar, Breko, Entero, Armoine, Lomoine, Whilphang Handpab	Mostly Mesic/ Aridic bordering on Xeric, Aridic	8-12. 90-180 Available summer moisture increases	16/48; 56/96	Saline bottoms: black greasewood. Great Basin sagebrush community/ Mostly Wyoming big sagebrush and black sagebrush; also shadscale, blackbrush, spiny hopsage, cliffrose, littleleaf horsebrush, littleleaf rabbitbrush, bottlebrush squirreltail, Nevada ephedra, desert needlegrass, Indian ricegrass, galleta, and scattered juniper. In the south and east: Moiave Desert	Shrubland, rangeland, wildlife habitat, and military reservations. Grazing has affected sagebrush communities by reducing native grasses and biological soil crusts. Rangeland has a low carrying capacity for cattle. Historic gold and silver mining. Active gold, silver, and clay mining operations are found in Esmeralda County and Lincoln County.	80k. Partly Forested 105	substrates. 5 Partially glaciated. High. rugged mountains with	carbonates and shale. Permian chert, argillite, and shale. Silurian limestone an limy siltstone. Ordovician volcanics, sha chert, and limestone. Rock outcrops occu Quaternary colluvial and morainal depos	d le, ir. (Haplargids) (Haplargids) Intury, Chad, Glean, Shalcleav, Hackwood, Parkay, Cavanaugh, Tusel its. Inceptisols	Xeric, Xeric	ss than 14/31.	squirreltail, and Thurber needlegrass; also serviceberry, snowberry, and mountain-mahogany. In protected snow pockets: aspen and chokecherry. Riparian areas: willows and chokecherry. Northwestern Nevada: western juniper woodland elements occur at mid-elevations.	to the west. Water quality has been lightly- to moderately-degraded by human activities. Historic gold mining south of Mountain City. Extensive gold mining operations continue, especially in the mountains near Jarbidge and Tuscarora.
13w. Tonopah	789 Mountains and hills drained by ephemeral	Ordovician carbonates, shale, and quartzite Cambrian shale, quartzite, and limestone. Precambrian phyllite. Rock outcrops occur. 6000- Quaternary colluvium and alluvium.	e. Mollisols (Argixerolls.	Powment, Lazan,	Mesic, Frigid.	toward the east and south. 11-18 50-120	18/42;	Juniper-pinyon woodland/ Mostly singleleaf pinyon and Utah	Woodland, shrubland, rangeland, wildlife habitat, military reservations. and mining.	Mountains	glacial features including moraines, cirques, and tarns. Perennial or intermittent, high- gradient, cold streams are fed by snow-melt and springs. Riffle segments have cobble or boulder substrates.	Tertiary rhyolitic and andesitic rocks. Upper Paleozoic limestone and dolomite Cambrian quartzite, limestone, and dolomite. Rock outcrops occur.	. (Eutrocryepts), Mollisols (Argicryolls, Haplocryolls, Argixerolls)	Xeric, Aridic bordering on Xeric 30	0-80 44/71	pine, and aspen groves. Near tree line, whitebark pine. Understory: low juniper, mountain big sagebrush, serviceberry, snowberry, mountain-mahogany, Idaho fescue, mountain brome, and Sandberg bluegrass. Highest elevations: some alpine tundra and meadows on poorly drained sites.	Historic gold mining; exploration continues. Streams in the Jarbidge Mountains near Jarbidge support the federally-threatened bull trout.
Uplands	washes. Surface water comes from infrequent precipitation events and scattered springs but is generally scarce.	9500; most mountain summits: 8000-9500/ 400-2600Tertiary andesite, rhyolite, and tuffs. Cretaceous granitics. Jurassic granitics, conglomerate, sandstone, and tuff. Triassic limestone. Upper Paleozoic chert, argillite, and shale. Mississippian shale, siltstone, sandstone, conglomerate, and limestone. Devonian carbonates. Ordovician shale and chert. Cambrian shale, carbonates, and quartzite. Rock outcrops occur.	Haploxerolls, Palexerolls, Haplocryolls), Entisols (Xerorthents)	Cucamungo, Bellehelen, Nupart, Mohocken, Ravenswood, Brier, Foxvire	Cryic/ Aridic bordering on Xeric		53/85	uniper with an understory of mountain big sagebrush, Wyoming big sagebrush, desert bitterbrush, low sagebrush, snowberry, green ephedra, bottlebrush squirreltail, bluegrass, lupine, and prairie unegrass. In the south and east: interior chaparral components such as Gambel oak. High elevations: scattered white fir, limber pine, and bristlecone pine occur but are extremely rare.	Historic gold and silver mining.	801. Salt Shrub Valleys	5 Nearly flat to gently sloping, internally drained basins flanked by alluvial fans and bajadas. Contains terraces, dunes, wetlands, hot springs, barren playas, and a few hills. Basin floors are often poorly drained, have a high water table, and pond water in the spring. Levels of its intermittent lakes vary seasonally and from year-to-year. Ephemeral and perennial streams occur. 4200-5200/Less than 50-600	Quaternary alluvium, loess, and playa, lacustrine, marsh, and landslide deposits. Once inundated by Pleistocene pluvial lakes. Hills: Tertiary tuffaceous sediment rocks and rhyolitic rocks.	Inceptisols (Halaquepts), Entisols (Torriorthents), Mollisols (Endoaquolls), Aridisols (Natridurids, Haplocambids)	e Mesic/ Aridic, Aridic bordering on Xeric Aridic bordering on Xeric	0-130 18/40; 51/89	Saltbush–greasewood and sagebrush steppe/ Black greasewood, rubber rabbitbrush, inland saltgrass, alkali sacaton, shadscale, bud sagebrush, rushes, Great Basin wildrye, bottlebrush squirreltail, and cheatgrass. On alluvial fans and hills: Wyoming big sagebrush, spiny hopsage, rabbitbrush, Thurber needlegrass, Indian ricegrass, Sandberg bluegrass, and bottlebrush squirreltail.	Mixed shrubland and grassland, rangeland, wildlife habitat, and irrigated cropland growing alfalfa and small grains. Water diversions for livestock and cropland are common.

SOURCES;

Barnes, C.P., and Marschner, F.J., 1933, Natural Land Use Areas of United States (map): U.S. Department of Agriculture, Bureau of Agricultural Economics, map scale 1:4,000,000.

Beatley, J.C., 1976, Vascular plants of the Nevada test site and central-southern Nevada – ecologic and geographic distributions: Springfield, Virginia, U.S. Department of Commerce, National Technical Information Service, Technical Information Center, Office of Technical Information, Energy Research and Development Administration, 308 p. Billings, W.D., 1945, The plant associations of the Carson Desert Region, western Nevada: Butler University Botanical

Studies, v. 7, p. 89-123. Billings, W.D., 1951, Vegetational zonation in the Great Basin of western North America in Les bases écologiques de la régénération de la végétation des zones arides (On the ecological foundations of the regeneration of vegetation in arid zones): International Union of Biological Sciences, International Colloquium, series B, no. 9, p. 101-122. Billings, W.D., 1978, Alpine phytogeography across the Great Basin: Great Basin Naturalist Memoirs, no. 2, p. 105-117.

Biological Resources Research Center, 2002, Nevada mountain atlas (electronic version): Reno, Nevada, University of Nevada, http://www.brrc.unr.edu. Brown, D.E., editor, 1994, Biotic communities - southwestern United States and northwestern Mexico (text and map): Salt Lake City, University of Utah Press, 342 p., map scale 1:1,000,000.

Brussard, P.F., Charlet, D.A., and Dobkin, D.S., Great Basin - Mojave Desert Region in Mac, M.J., Opler, P.A., Puckett Geological Survey, 964 p. Charlet, D.A., 1996, Atlas of Nevada conifers – a phytogeographic reference: Reno, Nevada, University of Nevada Press, 320 p.

University of Nevada Press, 224 p. Cornell, H.R., 1964, Mineral and water resources of Nevada: Reno, Nevada Bureau of Mines and Geology, Bulletin 65, 325 p. Cronquist, A., Holmgren, A.H., Holmgren, N.H., and Reveal, J.L., 1972, Intermountain flora - vascular plants of the intermountain west: New York, Hafner Publishing Company, v. 1, 270 p. Dunham, J.B., Peacock, M.M., Rieman, B.E., Schroeter, R.E., and Vinyard, G.L., 1999, Local and geographic variability

Fenneman, N.M., 1931, Physiography of western United States: New York, McGraw-Hill Book Company, 534 p. Fiero, B., 1986, Geology of the Great Basin: Reno, Nevada, University of Nevada Press, 212 p. Garside, L.J., Hess, R.H., Fleming, K.L., and Weimer, B.S., 1988, Oil and gas developments in Nevada: Reno, Nevada Bureau of Mines and Geology, Bulletin 104, 136 p.

p. 875-889.

Summary Table: Characteristics of the Ecoregions of Nevada

Haecker, C.E., and Doran, P.D., 1998, Status and trends of the nation's biological resources: Reston, Virginia, U.S. Chisholm, G., and Neel, L.A., 2001, Birds of the Lahontan Valley - a guide to Nevada's wetland oasis: Reno, Nevada,

in the distribution of stream-living Lahontan cutthroat trout: Transactions of the American Fisheries Society, v. 128,

Grayson, D.K., 1993, The desert's past - a natural prehistory of the Great Basin: Washington, D.C., Smithsonian Institution Press, 356 p. Hall, E.R., 1995, Mammals of Nevada: Reno, Nevada, University of Nevada Press, 734 p. Homer, C.G., Merrill, J.L., and Christensen, E.E., 1998, Intermountain Region Land Cover Characterization: Logan, Utah

State University, Remote Sensing/GIS Laboratory, CD-ROM prepared for the U.S. Department of Agriculture-Forest Service, Intermountain Region 4, Ogden, Utah. Houghton, J.G., Sakamoto, C.M., and Gifford, R.O., 1975, Nevada's weather and climate: Reno, University of Nevada, Nevada Bureau of Mines and Geology, Special Publication 2, p. 78. Hunt, C.B., 1967, Natural regions of the United States and Canada: San Francisco, W.H. Freeman and Company, 725 p.

Jaeger, E.C., 1957, The North American deserts: Stanford, California, Stanford University Press, 308 p. Jones, R.B., and Papke, K.G., 1984, Active mines and oil fields in Nevada: Reno, Nevada Bureau of Mines and Geology, Map 84, map scale 1:1,000,000.

Kuchler, A.W., 1964, Potential natural vegetation of the conterminous United States (map and manual): American Geographic Society, Special Publication 36, map scale 1:3,168,000. La Rivers, I., 1962, Fish and fisheries of Nevada: Reno, Nevada, University of Nevada Press, 782 p.

Loveland, T.R., Merchant, J.W., Brown, J.F., Ohlen, D.O., Reed, B.C., Olsen, P., and Hutchinson, J., 1995, Seasonal landcover regions of the United States: Annals of the Association of American Geographers, v. 85, no. 2, p. 339-355.

MacMahon, J.A., 1979, North American deserts - their floral and faunal components in Goodall, D.W., and Perry, R.A., editors, Arid-land ecosystems - structure, functioning, and management: Cambridge, U.K., Cambridge University Press, International Biological Programme, v. 1, p. 21-82. McGrath, C.L., Woods, A.J., Omernik, J.M., Bryce, S.A., Edmondson, M., Nesser, J.A., Shelden, J., Crawford, R.C., Comstock, J.A., and Plocher, M.D., 2002, Ecoregions of Idaho (two sided color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey, map scale 1:1,350,000. Miffin, M.D., and Wheat, M.M., 1979, Pluvial lakes and estimated pluvial climates of Nevada: Reno, Nevada Bureau of Mines and Geology, Bulletin 94, 57 p. Morefield, J.D., editor, 2001, Nevada rare plant atlas: Carson City, Nevada Natural Heritage Program, compiled for the U.S. Department of Interior, Fish and Wildlife Service, Portland, Oregon and Reno, Nevada.

Mozingo, H.N., 1987, Shrubs of the Great Basin – a natural history: Reno, Nevada, University of Nevada Press, 364 p. Naff, R.L., Maxey, G.B., Kaufmann, R.F., 1974, Interbasin ground-water flow in southern Nevada: Reno, Nevada Bureau of Mines and Geology, Report 20, 32 p. Nevada Bureau of Mines and Geology, 2000, The Nevada mineral industry: Reno, Nevada Bureau of Mines and Geology,

Special Publication MI-2000, 62 p. Osmond, C.B., Pitelka, L.F., and Hidy, G.M., editors, 1990, Plant biology of the Basin and Range: New York, Springer-Verlag, 375 p. Ryser, F.A., 1985, Birds of the Great Basin – a natural history: Reno, Nevada, University of Nevada Press, 642 p.

Shevenell, L., 1996, Statewide potential evapotranspiration maps for Nevada: Reno, Nevada Bureau of Mines and Geology, Report 48, 32 p. Shreve, F., 1942, The desert vegetation of North America: Botanical Review, v. VIII, no. 4, p. 195-246. Sigler, W.F., and Sigler, J.W., 1987, Fishes of the Great Basin – a natural history: Reno, Nevada, University of Nevada

Press, 425 p. Sigler, W.F., and Sigler, J.W., 1996, Fishes of Utah – a natural history: Salt Lake City, University of Utah Press, 375 p. Smith, G., editor, 2000, Sierra east – edge of the Great Basin: Berkeley, University of California Press, 488 p. Stewart, J.H., and Carlson, J.E., compilers, 1978, Geologic map of Nevada: Reston, Virginia, U.S. Department of Interior-

Geological Survey in cooperation with the Nevada Bureau of Mines and Geology, scale 1:500,000. Tanner, W.W., 1978, Zoogeography of reptiles and amphibians in the intermountain region: Great Basin Naturalist Memoirs, number 2, p. 43-53. Tingley, J.V., 1998, Mining districts of Nevada: Reno, Nevada Bureau of Mines and Geology, Report 47, 128 p.

Trimble, S., 1989, The sagebrush ocean - a natural history of the Great Basin: Reno, University of Nevada Press, 248 p. Tueller, P.T., Beeson, C.D., Tausch, R.J., West, N.E., and Rea, K.H., 1979, Pinyon-juniper woodlands of the Great Basin - distribution, flora, vegetal cover: Ogden, Utah, U.S. Department of Agriculture-Forest Service, Intermountain Forest and Range Experiment Station, Research Paper INT-229, 22 p.

U.S. Department of Agriculture-Natural Resources Conservation Service (formerly Soil Conservation Service), various county soil surveys of Utah. U.S. Department of Agriculture-Soil Conservation Service, 1981, Land resource regions and major land resource areas of the United States (text and maps): Washington, D.C., U.S. Department of Agriculture-Soil Conservation Service, Agriculture Handbook 296, 156 p., map scale 1:7,500,000. U.S. Department of Agriculture and Bureau of the Census, 1995, 1992 Census of agriculture: Washington, D.C., U.S. Government Printing Office, Agricultural atlas of the United States, v. 2, subject series, part 1, 199 p. U.S. Geological Survey, Topographic sheets of Idaho (various maps): Reston, Virginia, U.S. Department of Interior-Geological Survey, scales 1:100,000 and 1:250,000. West, N.E., 1988, Intermountain deserts, shrub steppes, and woodlands in Barbour, M.G., and Billings, W.D, editors, North American terrestrial vegetation: Cambridge, U.K., Cambridge University Press, p. 209-230. West, N.E., Tausch, R.J., Rea, K.H., and Tueller, P.T., 1978, Phytogeographical variation within juniper-pinyon woodlands of the Great Basin: Great Basin Naturalist Memoirs, number 2, p. 119-136. Winward, A.H., and McArthur, E.D., 1995, Lahontan sagebrush (Artemisia arbuscula ssp. longicaulis) – a new taxon: Great Basin Naturalist, v. 55, no. 2, p. 151-157. Woods, A.J., Lammers, D.A., Bryce, S.A., Omernik, J.M., Denton, R.L., Domeier, M., and Comstock, J.A., 2001, Ecoregions

of Utah (two sided color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S.

Geological Survey, map scale 1:1,175,000.

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