

Repeat photography on range and forest lands in the western United States

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Abstract

Repeat photography is a valuable tool for demonstrating the effects over time of climate, management and other variables on range and forest lands. This bibliography lists 175 publications using repeat photography, with information on the ecosystems photographed, states where they are located, number of photographs, and dates when the photographs were taken. References to photography of 19 natural ecosystems, 2 cultivated ecosystems and 3 special problems are listed. The interval between photographs may be over a century or less than a year.

Key Words: condition, trend, succession, invasion, brush, history

"One picture is worth a thousand words," says an often-quoted proverb. A pair or sequence of photographs, taken over time, can be even more valuable than a single photograph for documenting change in range or forest vegetation. In many cases, old photographs are the only documentation for past range or forest conditions; no numerical data exist. Also, non-specialists who are not accustomed to evaluating numerical data can see and understand changes over time as shown in photographs.

Repeat photography is most often used to show change over decades or as long as a century, with or without human intervention. Many of the entries in this bibliography are of this sort. Other entries include before-and-after photographs, showing short- or long-term effects of treatments such as chemical and mechanical brush and weed control, fire, grazing, and recreational use. Long-term repeat photography has been used to show recovery of abandoned townsites (Amundsen 1991) and recovery after timber cutting, mining, or wildfire.

Repeat photography can document trend as well as condition. For example, while further improvements in riparian management and condition are needed in many areas, this does not indicate that the trend is down. Johnson (1987) documented tremendous increases in woody plant vegetation, indicating upward trend, on riparian areas between the 1860's and the 1970's. Upward trend was shown on the Laramie, North Platte, Sweetwater, and Green Rivers, and on Box Elder, Beaver Dam, and Rock Creeks in Wyoming.

Sequences of photographs can document change over decades

on an annual or near-annual basis. The sequences of Sharp et al. (1990, 1992) are examples.

Many opportunities for repeat photography have not been exploited. Enough time has passed since re-photography of the sites in several of the publications that changes might be detected if they were re-photographed again. Vankat and Major (1978) rephotographed over 300 sites, but published only 5 pairs. Museums, universities, libraries, and private individuals own collections of old photographs that could be re-photographed to provide information on vegetation changes. Weber (1993) contains examples of photographs by Carleton E. Watkins, Eadward Muybridge, Timothy O'Sullivan, Andrew J. Russell, William Henry Jackson, John K. Hillers, Ben Wittick, and F. Jay Haynes, dating back to as early as 1866, and the libraries and archives in which these and other photographs can be found.

Several entries in this bibliography include suggestions for relocating and re-photographing previously photographed sites, and for interpreting the changes noted. These include Dingus (1982), Dutton and Bunting (1981), Gruell (1980a, 1983), Humphrey (1987), Johnson (1987), Magill (1989), and McGinnies et al. (1991). Knapp et al. (1990) discuss the use of repeat aerial photography.

Rogers et al. (1984) published a bibliography of repeat photography, listing several hundred publications containing photographs of the same scene taken decades or as much as a century apart. Many of these photo sets were of urban areas, glaciers, or other subject matter of little interest to range and forest managers and researchers. This bibliography lists all entries from Rogers et al. (1984) that include photographs of range or forest lands; publications issued after Rogers et al. (1984) completed their collection; and a few publications which they missed.

Entries have been tabulated (Table 1) by state and ecosystem. We did not find any examples of rephotography from North Dakota, Nebraska, Kansas, or Oklahoma, Alaska, or Hawaii, but did find examples from all the other western states plus Missouri.

Entries are in abbreviated form, including only the last name of the first author and the last 2 digits of the year of publication (Table 1). Additional information on numbers of photo sets, number of photos per set, and dates when photos were taken are included in the notes under each bibliographic entry. For example, "1964-67" indicates photos were taken sometime between 1964 and 1967 inclusive, while "1964 & 1967" indicates photos were taken in 1964 and 1967. Locations and ecosystems are noted when this information is not included in the title of the publication.

Table 1. References to repeat photography of range and forest lands in the western United States.

Riparian areas	Shrub-grasslands	Sagebrush-grasslands	Desert grasslands	Meadow	Multiple ecosystems	Coniferous forest
<u>Arizona</u> Alford 93 Anonymous 91 Bahre 78 Bezanson 89 Humphrey 87 Johnson 82 Stephens 87 Turner 80b <u>California</u> Magill 89 <u>Colorado</u> Anonymous 91 Atheam 88 Grette 90 McGinnies 91 Schulz 90 Tohill 90 <u>Idaho</u> Anonymous 91 Chaney 91 Ellis 93 <u>Montana</u> Anonymous 67,71 Chadde 88 Eichorn 82 <u>Nevada</u> Burkhardt 91 Chaney 91 <u>New Mexico</u> Humphrey 87 <u>Oregon</u> Anonymous 91 Chaney 91 Elmore 87 Skovlin 91 <u>Utah</u> Stephens 87 <u>Washington</u> Rickard 82 <u>Wyoming</u> Amundson 91 Anonymous 67 Bighorn NF Volunteers 76 Chadde 91 Chaney 91 Houston 82 Johnson 87 Stephens 87	<u>Arizona</u> Alford 93 Bryanson 85 Cox 83 Hughes 90,91 Johnsen 79 Laycock 75 Leopold 51 Martin 66,74a,75 Parker 52 Reynolds 56,68 Rich 61 Robinett 90,92 Turner 80a Wright 80 <u>Idaho</u> Gruell 86 Sharp 90 <u>Montana</u> Branson 81 <u>Nevada</u> Burkhardt 91 Gruell 86 <u>New Mexico</u> Columbus 80 Hennessy 83 Malde 73 <u>Oregon</u> Shinn 80 <u>Texas</u> Nelson 81,84,87 <u>Utah</u> Gruell 86 Lohman 74 Rogers 82 Urniss 83 <u>Wyoming</u> Amundson 91 Fisser 84 Gruell 86 Johnson 87	<u>Arizona</u> Hughes 80 <u>Colorado</u> Atheam 88 Tohill 90 <u>Idaho</u> Harniss 81,82 Laycock 67 Reppert 73 Vale 78 Yeo 90 <u>Montana</u> Anonymous 67,71 <u>New Mexico</u> Leopold 51 <u>Utah</u> Rogers 84 Washington Daubenmire 70 <u>Wyoming</u> Anonymous 67 Gruell 80a,b Houston 82 Loope 73 Vale 78 <u>Intermountain</u> Blaisdell 83 <u>Western US</u> Johnson 86	<u>Arizona</u> Ames 77 Bahre 78 Barker 93 Blydenstein 57 Brady 89 Cox 84 Glendening 52,55 Hastings 65 Hodgkinson 84 Hughes 90 Humphrey 63,87 Tschirley 61,64 <u>Nevada</u> Burkhardt 91 <u>New Mexico</u> Humphrey 87 Leopold 51 Potter 67 <u>Utah</u> Blaisdell 84 Laycock 75	<u>California</u> Gibbens 64 Heady 78 Vale 87 Vankat 78 <u>Colorado</u> Veblen 91 <u>Montana</u> Laycock 75 <u>Nevada</u> Timothy 80 <u>South Dakota</u> Lee 83 Progulske 74,91 <u>Utah</u> Tixier 88 <u>Wyoming</u> Bighorn NF Volunteers 76 Gruell 73,79 Houston 82 <u>Northern Rockies</u> Gruell 83	<u>Arizona</u> Bahre 91 Dutton 81 Gehlbach 81 Humphrey 87 Klett 84 Wright 82 <u>California</u> Klett 84 <u>Colorado</u> Klett 84 <u>Idaho</u> Klett 84 <u>Montana</u> Anonymous 69,79, 84,8? <u>Nevada</u> Klett 84 <u>New Mexico</u> Gehlbach 81 Humphrey 87 Klett 84 <u>South Dakota</u> Wright 82 <u>Utah</u> Klett 84 <u>Wyoming</u> Dorn 86 Kay 92 Klett 84 Wright 82 <u>Northern Great</u> Plains Phillips 63 <u>Western US</u> Dingus 82 <u>Unknown</u> Anonymous 43	<u>California</u> Gibbens 64 Heady 78 Magill 89 Vale 87 Vankat 78 <u>Colorado</u> Gary 77 Veblen 91 <u>Idaho</u> Stickney 86 <u>Montana</u> Anonymous 71 Gruell 82 Lyon 76,84 <u>Oregon</u> Edgerton 83 Skovlin 91 Weaver 59,68 <u>South Dakota</u> Lee 83 Progulske 74,91 Shideler 73 <u>Washington</u> Weaver 57,67 <u>Wyoming</u> Amundson 91 Bermsen 83 Bighorn NF Volunteers 76 Gruell 73,79, 80a,b Hoffman 76 Houston 82 Johnson 87 Loope 73 <u>Northern Rockies</u> Gruell 83
			Crested wheatgrass	Blowouts	Windbreaks	Gully control
		<u>Idaho</u>	<u>Colorado</u> Sharp 92	<u>Colorado</u> McGinnies 91	<u>Unknown</u> McGinnies 91	Heede 76
Aspen woodlands	Oak & oak-juniper woodlands	Pinyon-juniper woodlands	Tamarisk	Brush control	Sub-alpine	Desert
<u>New Mexico</u> Potter 67 <u>Oregon</u> Anderson 90 <u>Utah</u> Buchanan 71 Harniss 90 Mueggler 77 <u>Wyoming</u> Houston 82	<u>Arizona</u> Bahre 78 Hastings 65 Humphrey 87 <u>California</u> Vankat 78 <u>New Mexico</u> Humphrey 87	<u>Arizona</u> Despain 87 Leopold 51 <u>Nevada</u> Hattori 87 <u>New Mexico</u> Potter 67 Rogers 84	<u>Arizona</u> Hughes 93 <u>Nevada</u> Hughes 93 <u>Utah</u> Baars 71 Hughes 93	<u>Arizona</u> Cable 75,76 Martin 68,69,74b <u>Colorado</u> Fowler 90 <u>Wyoming</u> Sturges 93	<u>California</u> Vale 87 Vankat 78 <u>Oregon</u> Strickler 61,80 <u>Utah</u> Ellison 54 <u>Wyoming</u> Bighorn NF Volunteers 76 Gruell 73	<u>Arizona</u> Hastings 65 Humphrey 87 Lowe 59 Martin 77 Simmons 66 Steenbergh 83 Turner 90 <u>California</u> Webb 83 <u>Utah</u> Shoemaker 75
Forest-grass ecotone	Desert shrub & shrub-grasslands	Shortgrass prairie	Mixed prairie	Bunchgrass	Tallgrass prairie	Annual grasslands
<u>Arizona</u> Arnold 50 <u>Montana</u> Arno 83 <u>New Mexico</u> Allison 93 <u>South Dakota</u> Progulske 74,91	<u>Arizona</u> Ames 77 Cable 67,73 <u>Nevada</u> Blackburn 70	<u>Arizona</u> Bahre 78 <u>Colorado</u> Klipple 60 McGinnies 91 Peterson 92,93	<u>Montana</u> Anonymous 67 <u>Wyoming</u> Anonymous 67 Burr 61 Johnson 87	<u>Idaho</u> Porter 88 <u>Oregon</u> Anderson 90 Reid 80,91	<u>Missouri</u> Martin 93	<u>California</u> Biswell 63 Williams 87

Annotated Bibliography

- Alford, E. 1993.** Tonto rangelands—a journey of change. *Rangelands* 15:261–268.
Five pairs; 1977 & 1985, 1978 & 1985, 1980 & 1984 (quadrat), 1983 & 1990, 1985 & 1987. One trio; 1986, 1987 & 1989. Shrub-grassland and riparian, color.
- Allison, C. D. 1993.** Rangeland through time: a photographic documentation of range change in northern New Mexico, USA. *Proc. XVII Intl. Grassl. Cong.*:1614–1615.
Three pairs, 1957 & 1990, grassland transition to spruce or sedge.
- Allred, K. W. 1993.** The trail of E. O. Wooton. *New Mexico Resources* Iss. IX:3-18.
One pair, 1904 & 1992, desert shrub, New Mexico, color.
- Ames, C. R. 1977.** Along the Mexican border—then and now. *J. Ariz. Hist.* 18(4):431–446.
Six pairs, Arizona-Sonora border, 1892 & 1969. Desert shrub & grassland.
- Amundson, M. A. 1991.** Wyoming time and again. *Pruett Publ. Co.*, Boulder, Colo.
One hundred pairs, mostly urban or geological. Nineteen pairs, 1899–1910 & 1987–1988, and 1 pair, 1924 & 1988, include enough of the landscape to show vegetation change. An additional 11 pairs, 1901–1909 & 1987–1988, show recovery of vegetation on former townsites. Riparian, shrub-grass, and coniferous forest.
- Anderson, E. W., D. L. Franzen, and J. E. Melland. 1990.** Rx grazing to benefit watershed-wildlife-livestock. *Rangelands* 12:105–111.
Two pairs, 1979 & 1987, 1 bunchgrass and 1 aspen, Ore.
- Anonymous. 1943.** Range and livestock production practices in the Southwest. *USDA Misc. Pub.* 529.
Seven pairs, 1 trio, no dates or locations.
- Anonymous. 1967.** Land planning and classification report of the public domain lands in the Tongue River Area, Montana and Wyoming. *USDI, BLM Admin. Rep.*
Nine pairs 1907 & 1962; 6 pairs 1924–26 & 1961–62. Discusses 168 pairs. Riparian, sagebrush-grass, mixed grass.
- Anonymous. 1969.** Land planning and classification report of the public domain lands in the Middle Yellowstone River Area, Montana. *USDI, BLM Admin. Rep.*
Twenty-four pairs, 1907–30 & 1962–63.
- Anonymous. 1971.** Land planning and classification report of the public domain lands in the Musselshell River Area, Montana. *USDI, BLM, Montana State Off., Billings, Mont.*
Two pairs 1892 & 1962–64, 7 pairs 1903–05 & 1964–65, 2 pairs 1910 & 1966–67, 1 pair 1932 & 1964. Riparian, sagebrush-grass, coniferous forest.
- Anonymous. 1979.** Historical comparison photography: Missouri Breaks, Montana. *USDI, BLM, Montana State Off., Billings, Mont.*
Nineteen pairs 1903–07 & 1977; 25 pairs 1920–32 & 1977. One trio 1880–90, 1963 & 1977; 18 trios 1903–08, 1960–64 & 1977; 5 trios 1917–20, 1959–66 & 1977; 3 trios 1932, 1964 & 1977. Wide variety of plant communities and topography.
- Anonymous. 1984.** Historical comparison photography: Headwaters Resource Area, Butte District, Montana. *USDI, BLM, Montana State Off., Billings, Mont.*
Seventy pairs: first photographed “no date” (16), 1898 (7), “early 1900’s” (2), 1900–06 (12), 1910–16 (7), 1920–28 (17), 1931–38 (9). Rephotographed 1980–83. Two trios; 1898, 1921 & 1982 and 1937, 1980 & 1983. Wide variety of plant communities and topography.
- Anonymous. 1987.** Historical comparison photography: Mountain Foothills, Dillon Resource Area, Montana. *USDI, BLM, Montana State Off., Billings, Mont.*
Fifty-five pairs: first photographed 1865 (2), ca. 1880 (1), 1884 (1), ca. 1900 (1), ca. 1910 (12), 1916–17 (7), 1925–30 (13), 1935–40 (17), 1947 (1). Rephotographed 1978–79. Foothills and valleys, some riparian.
- Anonymous. 1991.** Riparian-Wetland Initiative for the 1990’s. *USDI, BLM, Washington, D.C.*
Five pairs. 1976 & 1987, Colorado; 1976 & 1986 and 1978 & 1986, Oregon; 1975 & 1990, Idaho; 1984 & 1988, Arizona. Effects of improved riparian management, color.
- Arno, S. F. and G. E. Gruell. 1983.** Fire history at the forest-grassland ecotone in southwestern Montana. *J. Range Manage.* 36:332–336.
Two pairs; 1872 & 1981 and 1936 & 1981.
- Arnold, J. F. 1950.** Changes in ponderosa pine bunchgrass ranges in northern Arizona resulting from pine regeneration and grazing. *J. For.* 48:118–126.
Two pairs, 1921–23 & 1947.
- Athearn, F. J. 1988.** Habitat in the past: Historical perspectives of riparian zones on the White River. *BLM Colorado State Office Cultural Resource Ser.* 23.
Two pairs 1907–08 & 1988, 2 pairs 1911 & 1988, 2 pairs 1924–25 & 1988, 6 pairs undated & 1988. Riparian and sagebrush grass, Colorado.
- Baars, D. L. and C. M. Molenaar. 1971.** Geology of Canyonlands and Cataract Canyon. *Four Corners Geol. Soc. 6th Field Conf. Guidebook.*
Five pairs, 1871 & 1978. Increase in tamarisk.
- Bahre, C. J. 1991.** A legacy of change: human impact on vegetation of the Arizona borderlands. *Univ. Arizona Press, Tucson, Ariz.*
Eleven trios; 1882–1912, 1962–86 & 1988–90. Two pairs (aerial), 1936 & 1983–84. Desert shrub-grasslands.
- Bahre, C. J. and D. E. Bradbury. 1978.** Vegetation change along the Arizona-Sonora boundary. *Ann. Assoc. Amer. Geog.* 68: 145–165.
Twelve trios: 1892, 1969 & 1976; 3 desert grassland, 4 oak woodland, 4 shortgrass prairie, and 1 riparian forest. Four are same as Ames (1977).
- Barker, S. and K. M. Egen. 1993.** Range trend monitoring in southern Arizona. *Rangelands* 15:166–167.
One set of 4; 1981, 1987, 1990 & 1991.
- Berntsen, C. M., R. B. Litton Jr., L. J. Lyon, P. E. Packer, P. M. Rees, J. E. Schmutz, P. R. Cleary, R. M. Hartman, and B. R. Keadle. 1983.** 1983 update, new directions in management on the Bighorn, Shoshone and Bridger-Teton National Forests. *USDA For. Serv. Intermtn. Reg., Rocky Mtn. Reg., Ogden, Utah.*
Fourteen pairs, 1979 & 1982. Recovery after cutting.
- Bezanson, C. E., and L. E. Hughes. 1989.** A riparian zone—one story. *Rangelands* 11:56–57.
Two pairs, 1976 & 1987, Arizona.
- Bighorn National Forest Volunteer Committee. 1976.** Re-discovering the Big Horns—a pictorial study of 75 years of ecological change. *Wyoming State Hist. Soc., Cheyenne, Wyo.*
Thirty-six pairs, 1900 & 1975–76. Forest, mountain meadow, riparian, alpine in Wyoming.
- Biswell, H. H. 1963.** Research in wildland fire ecology in California. *Proc. Tall Timbers Fire Ecol., Conf.* 2:63–97. Tall Timbers Research Station, Tallahassee, Fla.
One set of 5; 1949, 1950, 1952, 1955 & 1960. One undated set of 4. Woodland grass, California.
- Blackburn, W. H., and P. T. Tueller. 1970.** Pinyon and juniper invasion in black sagebrush communities in east-central Nevada. *Ecol.* 51:841–848.
One pair, 1923 & 1966.
- Blaisdell, J. P., and R. C. Holmgren. 1984.** Managing intermountain rangelands—salt-desert shrub ranges. *USDA For. Serv. Gen. Tech. Rep. INT-163.*
One pair 1935 & 1982. Desert grass, Wah-Wah Valley, Ut.
- Blaisdell, J. P., R. B. Murray, and E. D. McArthur. 1983.** Managing intermountain rangelands—sagebrush grass ranges. *USDA For. Serv. Gen. Tech. Rep. INT-134.*
One pair 1952 & 1964. Two sets of four; 1937, 1938, 1942 & 1966; 1952, 1955, 1958 & 1964.
- Blydenstein, J. C., R. Hungerford, G. I. Day, and R. R. Humphrey. 1957.** Effect of domestic livestock exclusion on vegetation in the Sonoran Desert. *Ecol.* 38:522–526.
One pair, 1906 & 1957, Arizona.
- Brady, W. W., M. R. Stromberg, E. F. Aldon, C. D. Bonham, and S. H. Henry. 1989.** Response of a semidesert grassland to 16 years of rest from grazing. *J. Range Manage.* 42:284–288.
One pair, 1975 and 1986, Arizona
- Branson, F. A. 1985.** Vegetation changes on western rangelands. *Soc. Range Manage. Range Monogr. 2. Soc. Range Management, Denver, Colo.*
One pair, 1960 & 1978, shortgrass-sagebrush, Montana. One pair, 1907 & 1960, juniper-black grama, Arizona.

- Branson, F. A. and R. F. Miller. 1981.** Effects of increased precipitation and grazing management on northeastern Montana rangelands. *J. Range Manage.* 34:3-10.
Three pairs, 1960 & 1978, shrub invasion of grassland.
- Buchanan, H. 1971.** Changing conditions in the forests of Bryce Canyon National Park, Utah. *Proc. Utah Acad. Sci. Arts & Let.* 48:31-36.
Three pairs, 1957 & 1969; aspen, bitterbrush and understory. Deterioration despite exclusion of livestock.
- Burkhardt, W. 1991.** Then and now: the western range. *Range Mag. Spring* 1992:12-14.
Three pairs; 1919 & 1981, desert grass; 1920 & 1982, shrub-grass; 1911 & 1982, riparian. Nevada, rephotographed in color.
- Burr, R. D. 1961.** Time and range vegetation. *USDI BLM Our Public Lands* 11 (2):8-9, 12-13.
Two pairs 1870 & 1958, 1 pair 1869 & 1959. Two grassland, 1 geologic formations, Wyoming. Also in Johnson (1987).
- Cable, D. W. 1967.** Fire effects on semidesert grasses and shrubs. *J. Range Manage.* 20:170-176.
Set of four, 14-year period, Santa Rita Experimental Range, Arizona.
- Cable, D. W. 1973.** Fire effects in southwestern semidesert grass-shrub communities. *Proc. Tall Timbers Fire Ecol. Conf.* 12:109-127. Tall Timbers Research Station, Tallahassee, Fla.
One pair, 1903 & 1941; 1 trio, 1952, 1958 & 1966. Santa Rita Experimental Range, Arizona.
- Cable, D. W. 1975.** Range management in the chaparral type, and its ecological basis—The status of our knowledge. *USDA For. Serv. Res. Paper RM-155.*
One pair, 1936 & 1960, after brush grubbing and reseeding, Arizona.
- Cable, D. W. 1976.** Twenty years of change in grass production following mesquite control and reseeding. *J. Range Manage.* 29:286-289.
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- Chadde, S. W., and C. E. Kay. 1991.** Tall-willow communities on Yellowstone's northern range: a test of the "natural-regulation" paradigm. p. 231-262 *In: R. B. Keiter and M. S. Boyce (eds.) The Greater Yellowstone Ecosystem: redefining America's wilderness heritage.* Yale Univ. Press, New Haven, Conn.
Four pairs; 1893 & 1988, 1896-97 & 1988, 1915 & 1987, 1949 & 1988. One trio; 1921, 1954 & 1986. Riparian, Wyoming.
- Chaney, E., W. Elmore and W. S. Platts. 1991.** Livestock grazing on Western riparian areas. *US Govt. Print. Off., Washington, DC.*
Three pairs; 1975 & 1985, Nevada; 1976 & 1986, Oregon; 1985 & 1986, Idaho. Also 2 near-matches; 1976 & 1980, Wyoming; 1985 & 1988, Idaho. Color.
- Columbus, J. T. 1980.** Watershed abuse—the effect on a town. *Rangelands* 2:148-151.
One pair, 1908 & 1980, juniper-grassland, New Mexico.
- Cox, J. R., H. L. Morton, J. T. La Baume, and K. G. Renard. 1983.** Reviving Arizona's rangelands. *J. Soil Water Cons.* 38:342-345.
Two pairs, 1933 & 1980, and 1 pair "before and after brush control," shrub-grass, Arizona.
- Cox, J. R., H. L. Morton, T. N. Johnsen Jr., G. L. Jordan, S. C. Martin, and L. C. Fierro. 1984.** Vegetation restoration in the Chihuahuan and Sonoran deserts of North America. *Rangelands* 6:112-115.
Two pairs, 1902 & 1980 and 1933 & 1980, desert grassland, Arizona.
- Daubenmire, R. 1970.** Steppe vegetation of Washington. *Washington Agr. Exp. Sta. Tech. Bull.* 62.
One pair "10 years apart," sagebrush-grass and riparian; 1 undated pair bluebunch wheatgrass-sandberg bluegrass; 1 trio 1916, 1939 & 1968, grassland.
- Despain, D. W. 1987.** History and results of prescribed burning on pinyon-juniper woodland on the Hualapai Indian Reservation in Arizona, p. 145-151. *In: R. L. Everett (comp.) Proceedings—Pinyon-Juniper Conference.* *USDA For. Serv. Gen. Tech. Rep. INT-215.*
One pair, 1955 & 1985.
- Dingus, R. 1982.** The photographic artifacts of Timothy O'Sullivan. *Univ. New Mexico Press, Albuquerque, N.M.*
Fifty-eight pairs, 1867-74 & 1980, all over West.
- Dorn, R. D. 1986.** The Wyoming landscape, 1805-1878. *Mountain West Publ., Cheyenne, Wyo.*
One pair, 1866 & 1985, shrub-grass; 4 pairs, 1870 & 1985, 1 grease-wood, 1 riparian, 2 grassland; 1 pair, 1870 & 1937, riparian. Also extensive bibliography of travelers' journals describing 19th-century landscapes, with 14 photos of same areas in 1985.
- Dutton, A. A. and D. T. Bunting. 1981.** Arizona then and now: A comprehensive rephotographic project. *Ag² Press, Phoenix, Ariz.*
One hundred nine pairs, over 80-100 years, variety of ecosystems.
- Edgerton, P. J. 1983.** Response of the bitterbrush understory of a central Oregon lodgepole pine forest to logging disturbance, p. 99-106. *In: A. R. Tiedemann and K. L. Johnson (comps.) Research and management of bitterbrush and cliffrose in western North America.* *USDA For. Serv. Gen. Tech. Rep. INT-152.*
One trio; prelogged stand and 2 & 5 years after logging.
- Eichhorn, L. C. 1982.** LU land projects—preserving the land and the people. *Rangelands* 4:72-73.
Three pairs, 1936-37 & 1981, reservoirs and watersheds on grasslands, Montana.
- Ellis, S. and L. Danly. 1993.** Prescription for a troubled stream. *Rangelands* 15:233-235.
One pair, 1988 & 1990; one trio, 1985, 1986 & 1990. Idaho.
- Ellison, L. 1954.** Subalpine vegetation of the Wasatch Plateau, Utah. *Ecol. Monogr.* 24:89-184.
Two pairs, 1913 & 1940 and 1913 & 1947, small quadrats. Four pairs, 1910 & 1948, 1917 & 1941, 1932 & 1947, 1943 & 1948.
- Elmore, W. and R. L. Baschta. 1987.** Riparian areas: Perceptions in management. *Rangelands* 9:260-266.
Five pairs in color; 1976 & 1984, before and after 3 years of rest, 1976 & 1986, 1968 & 1984, before and after 8 years of exclusion from grazing, Oregon.
- Fisser, H. G. and L. A. Joyce. 1984.** Atriplex-grass and forb relationships under no grazing and shifting precipitation patterns in north-central Wyoming, p. 87-96. *In: A. R. Tiedemann, E. D. McArthur, H. C. Stutz, R. Stevens, and K. L. Johnson (comps.) Proceedings of the symposium on the biology of Atriplex and related chenopods.* *USDA For. Serv. Gen. Tech. Rep. INT-172.*
One pair, 1964 & 1979.
- Fowler, R. 1990.** Grazing management heads Colorado range in right direction. *Rangelands* 12:308-312.
Two pairs, 1976 & 1990 and 1976 & 1983, sagebrush control, color.
- Gary, H. L. and P. O. Currie. 1977.** The Front Range pine type—A 40-year photographic record of plant recovery on an abused watershed. *USDA For. Serv. Gen. Tech. Rep. RM-46.*
Fifteen pairs, 1937 & 1977, Colorado.
- Gehlbach, F. R. 1981.** Mountain islands and desert seas. *Texas A & M Univ. Press, College Station, Tex.*
73 pairs, 80-100 years apart, of monument markers along US-Mexican border between Rio Grande and Colorado Rivers. Variety of ecosystems. See also Dutton (1981) and Humphrey (1987).
- Gibbens, R. P. and H. F. Heady. 1964.** The influence of modern man on the vegetation of Yosemite Valley. *California Agr. Exp. Sta. Ext. Serv. Man.* 36.
Two pairs, 1866 & 1961, 1921-33 & 1961. Nine trios; 1866-1899, 1943 & 1961. Meadow and coniferous forest.
- Glendening, G. E. 1952.** Some quantitative data on the increase of mesquite and cactus on a desert grassland range in southern Arizona. *Ecol.* 33:319-328.
One pair, 1932 & 1949, increase in woody plants and decrease in grass in enclosure.
- Glendening, G. E. 1955.** Reproduction and establishment of velvet mesquite as related to invasion of semidesert grasslands. *USDA For. Serv. Tech. Bull.* 1127.
One pair, 1903 & 1941, Arizona.
- Grette, T. 1990.** Successful range management in the McCoy Gulch riparian demonstration area. *Rangelands* 12:305-307.
Two pairs, 1987 & 1990, Colorado, color.

- Gruell, G. E. 1973.** An ecological evaluation of Big Game Ridge. USDA For. Serv. Intermtn Region, Ogden, Ut.
One pair, 1872 & 1969; 1 pair, 1893 & 1968; 4 pairs, 1915 & 1969-71; 4 pairs, 1928 & 1969; 1 pair, 1967 & 1971. One trio, 1969, 1970 & 1971. Coniferous forest, mountain meadows and alpine, Teton National Forest, Wyoming.
- Gruell, G. E. 1979.** Habitat investigations and management implications on the Bridger-Teton National Forest, p. 63-74. *In:* M. S. Boyce and L. D. Hayden-Wing (eds.) North American elk; ecology, behavior and management. Univ. Wyoming, Laramie, Wyo.
Six pairs; 1878 & 1968, 1887-96 & 1969, 1899 & 1971, 1906 & 1968, 1918 & 1967, 1939 & 1968. Coniferous forest and meadows, Wyoming.
- Gruell, G. E. 1980a.** Fire's influence on wildlife habitat on the Bridger-Teton National Forest, Wyoming. Vol. I—Photographic record and analysis. USDA For. Serv. Res. Paper INT-235.
Eighty-five pairs: 11 pairs, 1872-78 & 1968-69; 2 pairs, 1883 & 1970; 19 pairs, 1892-99 & 1968-75; 22 pairs, 1900-09 & 1968-74; 16 pairs, 1910-19 & 1968-71; 11 pairs, 1920-28 & 1968-72; 3 pairs, 1935-39 & 1968-73; and 3 pairs, 1942 & 1968-70. Sagebrush and coniferous forest.
- Gruell, G. E. 1980b.** Fire's influence on wildlife habitat on the Bridger-Teton National Forest, Wyoming. Vol. II—Changes and causes; management implications. USDA For. Serv. Res. Paper INT-235.
Four pairs; ca. 1905 & 1972, 1954 & 1968 (quadrat), 1954 & 1976 (quadrat), 1967 & 1969.
- Gruell, G. E. 1983.** Fire and vegetative trends in the Northern Rockies: Interpretations from 1871-1982 photographs. USDA For. Serv. Gen. Tech. Rep. INT-158.
Eighty-three pairs. First photographed 1871-72 (14), 1880-88 (7), 1894-99 (8), 1900-09 (24), 1910-17 (6), 1920-28 (15), 1930-36 (5), 1940-46 (4). Rephotographed 1979-82. Coniferous forest, meadows.
- Gruell, G. E. 1986.** Post-1900 mule deer irruptions in the Intermountain West: principle cause and influences. USDA For. Serv. Gen. Tech. Rep. INT-206.
Five pairs: 1868 & 1982, juniper-grass, Nevada; 1870 & 1967, sagebrush-grass, Wyoming; 1871 & 1981, recovery of valley from mining, Montana; 1901 & 1976, juniper-grass, Utah; 1907 & 1982, juniper-grass, Idaho.
- Gruell, G. E., W. C. Schmidt, S. F. Arno, and W. J. Reich. 1982.** Seventy years of vegetative change in a managed ponderosa pine forest in western Montana—Implications for resource management. USDA For. Serv. Gen. Tech. Rep. INT-130.
Ten sets of seven; 1909, 1925, 1937, 1948, 1958, 1968 & 1969. One set of four; 1909, 1925, 1937 & 1948.
- Harniss, R. O. and D. L. Barton. 1990.** Pine Hollow exclosures—a 19-year record of an aspen stand treated with 2,4-D. *Rangelands* 12:37-39.
One trio; 1965, 1968 & 1984, Utah.
- Harniss, R. O. and H. A. Wright. 1981.** Summer grazing of sagebrush grass range by sheep—a photo record. *Rangelands* 3:160-162.
Three pairs, 1965 & 1974, Idaho. Better photos than Harniss and Wright (1982).
- Harniss, R. O. and H. A. Wright. 1982.** Summer grazing of sagebrush-grass range by sheep. *J. Range Manage.* 35:13-17.
Three sets of four, 1965, 1966, 1969 & 1974. Early, late or no grazing, fuzzy closeups, Idaho.
- Hastings, J. R. and R. M. Turner. 1965.** The changing mile; an ecological study of vegetation change with time in the lower mile of an arid and semiarid region. Univ. Arizona Press, Tucson, Ariz.
Ninety-six pairs. Oak woodland: 20 pairs, 1887-95 & 1962; 3 pairs, 1909-11 & 1962; 3 pairs, 1925-31 & 1962. Desert grassland: 3 pairs, 1883-87 & 1960-62; 27 pairs, 1890-99 & 1960-65; 4 pairs 1911-15 & 1962. Desert: 3 pairs, 1890 & 1962; 12 pairs 1903-08 & 1960-62; 9 pairs 1913-16 & 1960-62; 12 pairs 1932-35 & 1960-62. Arizona and Sonora.
- Hattori, E. M. and M. A. Thompson. 1987.** Episodic, historic pinyon use and deforestation in the Cortez Mining District, Eureka County, Nevada, p. 125-128. *In:* R. L. Everett (comp.) Proceedings—pinyon-juniper conference. USDA For. Serv. Gen. Tech. Rep. INT-215.
One pair, 1900 & 1983.
- Heady, H. F. and P. J. Zinke. 1978.** Vegetational changes in Yosemite Valley. US Dept. Int. Natl. Park Serv. Occ. Paper 5.
Two pairs, 1866 & 1961-73, conifers and meadow.
- Heede, B. H. 1976.** Gully development and control: the status of our knowledge. USDA For. Serv. Res. Paper RM-169.
One pair, 1961 & 1964, gully control, no location.
- Hennessy, J. T., R. P. Gibbens, J. M. Tromble, and M. Cardenas. 1983.** Vegetation changes from 1935 to 1980 in mesquite dunelands and former grasslands of southern New Mexico. *J. Range Manage.* 36:370-374.
One pair, 1934 & 1980.
- Hodgkinson, H. S. 1984.** Conservation on Hopi rangelands. *Rangelands* 6:155-157.
Five pairs; first photographed in 1936, 1945 (2), 1957, or 1962, rephotographed in 1982. Desert grassland, Arizona.
- Hoffman, G. R. and R. R. Alexander. 1976.** Forest vegetation of the Bighorn Mountains, Wyoming: a habitat type classification. USDA For. Serv. Res. Paper RM-170.
Two pairs, 1901-05 & 1973.
- Houston, D. B. 1982.** The northern Yellowstone elk; ecology and management. MacMillan, N.Y.
Sixty pairs, three larger sets. Seven pairs, 1871 & 1971-73; 27 pairs, 1885-1900 & 1970-74; 9 pairs, 1900-18 & 1969-73; 5 pairs, 1921-29 & 1971-73; landscape scale. One set of five, 1949, 1950, 1954, 1958, & 1978; 1 pair, 1933 & 1972; 3 pairs, 1941-43 & 1971-74; 6 pairs 1954-58 & 1974; site scale. One set of five, 1949, 1950, 1954, 1958, & 1978; 1 trio, 1948, 1958 & 1978; 2 pairs 1951 & 1958; quadrats. Coniferous forest, meadow, sagebrush-grass, aspen, riparian, Wyoming.
- Hughes, L. E. 1980.** Six grazing exclosures with a message. *Rangelands* 2:17-18.
Two pairs, 1953 & 1975, sagebrush-grass, Arizona.
- Hughes, L. E. 1990.** Twenty years of rest-rotation grazing on the Arizona Strip—an observation. *Rangelands* 12:173-176.
Three pairs, 1969 or 1974 & 1988, shrub-grass and desert grassland, Arizona.
- Hughes, L. E. 1991.** Drought and 2 grazing systems. *Rangelands* 13:229-232.
Three pairs, 1986 & 1990, shrub-grass, Arizona, color.
- Hughes, L. E. 1993.** "The devil's own"—tamarisk. *Rangelands* 15:151-155.
Three pairs; 1921 & 1992, 1940 & 1991, 1966 & 1992. Nevada, Utah and Arizona.
- Humphrey, R. R. 1963.** The role of fire in the desert and desert grassland areas of Arizona. *Proc. Tall Timbers Fire Ecol. Conf.* 2:44-61. Tall Timbers Res. Station, Tallahassee, Fla.
Two pairs, 1893 & 1963 and 1903 & 1941.
- Humphrey, R. R. 1987.** Ninety years and 535 miles: vegetation changes along the Mexican border. Univ. New Mexico Press, Albuquerque, N.M.
Two hundred three pairs, 1892-93 & 1983-84. One hundred thirty-four desert, 40 semi-desert grassland, 12 oak and juniper woodland, 2 semi-desert grassland and scrub, 8 semi-desert grassland and woodland, 2 riparian, 5 urban. Arizona, New Mexico, Chihuahua, Sonora.
- Johnsen, T. N. Jr. and J. W. Elson. 1979.** Sixty years of change on a central Arizona grassland-juniper woodland ecotone. USDA-SEA ARM-W-7.
Twenty pairs, 1916 & 1977.
- Johnson, K. L. 1986.** Sagebrush over time: a photographic study of rangeland change, p. 223-253. *In:* E. D. McArthur and B. L. Welch (comp.) Proceedings of the Symposium on Biology of *Artemisia* and *Chrysothamnus*. USDA For. Serv. Gen. Tech. Rep. INT-200.
Ten pairs, 1869-72 & 1977-79, and 8 pairs, 1869-72 & 1984-85. One trio 1871, 1976 & 1985.
- Johnson, K. L. 1987.** Rangeland through time. Univ. Wyoming Agr. Exp. Sta. Misc. Publ. 50.
Fifty-six pairs, 1869-70 & 1977-85. Twenty-eight plains grasslands and shrub-grasslands, 15 riparian, 13 foothills and mountains. Fifty-five pairs in Wyoming, 1 in Utah, many with geologic landmarks.

- Johnson, R. R. and S. W. Carothers. 1982.** Riparian habitats and recreation: Interrelationships and impacts in the Southwest and Rocky Mountain region. Eisenhower Consortium for Western Environmental Forestry Bull. 12.
Two pairs, 1940-42 & 1981, Arizona.
- Kay, C. E. 1992.** Yellowstone before and after. *Montana Stockgrower* 64(1):32-34.
Three pairs; 1893 & 1988, 1896-97 & 1988, 1949 & 1988.
- Klett, M., E. Manchester, J. Verburg, G. Bushaw, and R. Dingus. 1984.** Second view: the Rephotographic Survey Project. Univ. New Mexico Press, Albuquerque, N.M.
One hundred eighteen pairs and 1 trio, first photographed over wide range of dates, rephotographed 1977-79. Four pairs from Arizona, 2 pairs from California, 36 pairs and 1 trio from Colorado, 5 pairs from Idaho, 17 pairs from Nevada, 5 pairs from New Mexico, 29 pairs from Utah, 20 pairs from Wyoming. Many are primarily geological, but most show some vegetation of most of the types present in the region.
- Klippel, G. E. and D. F. Costello. 1960.** Vegetation and cattle responses to different intensities of grazing on short-grass ranges on the Central Great Plains. USDA Tech. Bull. 1216.
One pair, 1942 & 1948, Colorado.
- Knapp, P. A., P. L. Warren, and C. F. Hutchinson. 1990.** The use of large-scale aerial photography to inventory and monitor arid rangeland vegetation. *J. Environ. Manage.* 31:29-38.
- Laycock, W. A. 1967.** How heavy grazing and protection affect sagebrush-grass ranges. *J. Range Manage.* 20:206-213.
One set of four; 1952, 1955, 1958, and 1964. One pair, 1952 & 1964. Idaho.
- Laycock, W. A. (ed.) 1975.** Rangeland reference areas. SRM Range Sci. Ser. 3. Soc. Range Management, Denver, Colo.
Four pairs: 1945 & 1974, juniper-grass, Arizona; 1946 & 1965, mountain grassland, Montana; 1932 & 1953 (landscape) and 1919 & 1953 (quadrat), grassland, Utah.
- Lee, B. 1983.** They came for the gold and stayed for the grass. *Rangelands* 5:195-199.
One pair, 1874 & 1983, coniferous forest and meadow, South Dakota.
- Leopold, L. B. 1951.** Vegetation of southwestern watersheds in the nineteenth century. *Geogr. Rev.* 41:295-316.
Two pairs; 1910 & 1946, sagebrush-grass, and 1900 & 1946, desert grass, New Mexico. Two pairs, 1895 & 1940, shrub-grass and juniper, Arizona. Mentions 59 pairs, lists 30 early manuscripts on vegetation of the Southwest.
- Lohman, S. W. 1974.** The geologic story of Canyonlands National Park. *US Geol. Surv. Bull.* 1327.
Two pairs 1871 & 1968, rock formations with some vegetation, Utah.
- Loope, L. L. and G. E. Gruell. 1973.** The ecological role of fire in the Jackson Hole area, northwestern Wyoming. *Quat. Res.* 3:425-443.
Two pairs, 1899 & 1971, forest and sagebrush-grass.
- Lowe, C. H. Jr. 1959.** Contemporary biota of the Sonoran Desert-problems, p. 54-74. *In: Univ. Arizona Arid Lands Colloquia.*
One pair, 1907 & 1959; 1 trio, 1906, 1928 & 1959.
- Lyon, L. J. 1976.** Vegetal development in the Sleeping Child Burn in western Montana, 1961-1973. USDA For. Serv. Res. Paper INT-184.
Two sets of seven, 1962, 1963, 1965, 1967, 1969, 1971, & 1973, showing recovery of coniferous forest from burn.
- Lyon, L. J. 1984.** The Sleeping Child Burn—21 years of postfire change. USDA For. Serv. Res. Paper INT-330.
Three sets of 8; 1962, odd years 1963 through 1973, & 1982. Recovery of coniferous forest from burn, Montana.
- Magill, A. W. 1989.** Monitoring environmental change with color slides. USDA For. Serv. Gen. Tech. Rep. PSW-117.
Fourteen pairs; first photographed 1964 (2), 1965 (3), 1966 (2), 1967, 1969 (4), and 1977 (2), rephotographed 1986. Two pairs; 1965 & 1977 and 1966 & 1985. Seven trios; first two photographs 1964 & 1969, 1964 & 1977 (2), 1965 & 1970, 1965 & 1977, 1967 & 1969, and 1969 & 1977, third photograph 1986. Coniferous forest and riparian, recovery from logging and recreational use, California, color.
- Malde, H. E. 1973.** Geologic bench marks by terrestrial photography. *US Geol. Surv. J. Res.* 1:193-206.
Two pairs, 1915 & 1970, desert grassland with juniper, N.M.
- Martin, P. and G. F. Houf. 1993.** Glade grasslands in southwest Missouri. *Rangelands* 15:70-73.
One pair, 1963 & 1983, landscape and quadrat; 1 pair landscape only, no dates.
- Martin, S. C. 1966.** The Santa Rita Experimental Range—a center for research on improvement and management of semidesert rangelands. USDA For. Serv. Res. Paper RM-22.
Two pairs, 1903 & 1964 and 1960 & 1964; 1 trio, 1905, 1941 & 1962; 2 trios, 1959, 1962 & 1963; 1 set of four, 1920, 1935, 1958, & 1962. Shrub-grass, Arizona.
- Martin, S. C. 1968.** Improving semidesert ranges in southern Arizona, USA, by grazing management and shrub control. *Ann. Arid Zone* 7:235-242.
Two trios; 1919, 1935 & 1958 and 1919, 1948 & 1962.
- Martin, S. C. 1975.** Ecology and management of southwestern semidesert grass-shrub ranges—The status of our knowledge. USDA For. Serv. Res. Paper RM-156.
Three pairs; 1903 & 1941, 1903 & 1964, 1922 & 1935. One trio; 1905, 1941 & 1962. Two trios; 1961, 1962 & 1963. Arizona.
- Martin, S. C. and D. R. Cable. 1974a.** Managing semidesert grass-shrub ranges—vegetation responses to precipitation, grazing, soil texture, and mesquite control. USDA For. Serv. Tech. Bull. 1480.
Two pairs, 1903 & 1964. One trio; 1959, 1962 & 1963. Two trios; 1958, 1959 & 1966. Arizona.
- Martin, S.C. and F.H. Tschirley. 1969.** Changes in cactus numbers after cabling. *Prog. Agr. Ariz.* 21(1):16-17.
One trio, before & after cabling in 1961 & 1966; 1 pair, 1961 & 1966. Shrub-grass, Arizona.
- Martin, S. C. and R. M. Turner. 1977.** Vegetation change in the Sonoran Desert Region, Arizona and Sonora. *J. Arizona Acad. Sci.* 12(2):59-69.
Six series of three to six: 1903, 1941 & 1975; 1905, 1941, 1962, & 1975; 1906, 1928, 1959, 1968, & 1975; 1907, 1959 & 1970; 1919, 1951 & 1975; and 1922, 1935, 1947, 1958, 1969, & 1975.
- Martin, S. C., J. L. Thames and E. B. Fish. 1974b.** Changes in cactus numbers and herbage production after chaining and mesquite control. *Prog. Agr., Ariz.* 26(6):3-6.
Two trios; 1905, 1940 & 1962 and 1959, 1970 & 1974. Arizona.
- McGinnies, W. J., H. L. Shantz, and W. G. McGinnies. 1991.** Changes in vegetation and land use in eastern Colorado: a photographic study, 1904 to 1986. USDA, ARS ARS-85.
Fifty-eight matched sets, several other poorly matched sets. Grasslands: 1 set of four, 14 trios, 8 pairs; photographed on some combination of 1907-10, 1913-14, 1937-40, 1949-53, & 1985-86. Transition and foothills; 12 trios, 1904-13, 1949 & 1985-86; 2 pairs, 1904-13 & 1949. Blowouts; 6 sets of four, 1909-15, 1940, 1949-53, 1985-88; 4 trios with one of the preceding dates omitted; 2 pairs, 1907 & 1949. Riparian and gullies; 4 trios, 1905-07, 1949 & 1985-86. Windbreaks; 1 set of four, 1908, 1916, 1937, & 1949; 3 pairs, 1908 & 1937, 1915 & 1959, 1937 & 1949.
- Mueggler, W. F. and D. L. Bartos. 1977.** Grindstone Flat and Big Flat exclosures; a 41-year record of changes in clearcut aspen communities. USDA For. Serv. Res. Paper INT-195.
Two pairs, 1942 and 1975, Utah.
- Nelson, J. T. 1981.** The historic vegetative aspect of Ft. Davis, Texas. Fort Davis National Historic Site, National Park Service. (On file at Ft. Davis)
Nineteen pairs, 1870-90's & 1980's. Invasion and increase of catclaw acacia.
- Nelson, J. T. 1984.** Progress report on Chihuahuan Desert research—cretaceous. Chihuahuan Desert Research Institute, Alpine, Tex. (On file at the Chihuahuan Desert Research Institute)
Fifteen pairs, 1899 & mid-1980's, Texas.
- Nelson, J. T. and P. L. Beres. 1987.** Was it grassland? A look at vegetation in Brewster County, Texas through the eyes of a photographer in 1899. *Texas J. Agr. Nat. Res.* 1:34-37. (Library, Sul Ross State University, Alpine, Tex)
Four pairs, 1899 & 1984.

- Parker, K. W. and S. C. Martin. 1952.** The mesquite problem on southern Arizona ranges. USDA For. Serv. SW For. Range Exp. Sta. Circ. 908.
One pair, 1903 & 1941; 2 pairs, 1940 & 1944; 3 pairs, March–April 1945 & September 1945.
- Peterson, M., and B. Berlinger. 1993.** Grazing management improves range and livestock production on Colorado's eastern plains. *Rangelands* 15:168–170.
One pair quadrats, 1984 & 1990, color.
- Peterson, M., K. Lutz, and B. Berlinger. 1992.** Rangeland management benefits livestock and wildlife. *Rangelands* 14:73–75.
One pair, 1986 & 1990, shortgrass, color.
- Phillips, W. S. 1963.** Photographic documentation, vegetational changes in northern Great Plains. Univ. Arizona Agr. Exp. Sta. Rep. 214.
One hundred sixty-three pairs, 1908–1931 & 1958–59.
- Porter, S. D. and C. D. Jorgenson. 1988.** Longevity of harvester ant colonies in southern Idaho. *J. Range Manage.* 41:104–107.
Two pairs, 1977 & 1986, grassland.
- Potter, L. D. and J. C. Krenetsky. 1967.** Plant succession with released grazing on New Mexico rangelands. *J. Range Manage.* 20:145–151.
Six pairs, 1939–40 & 1964, and 2 pairs, 1943 & 1965; grazed vs. ungrazed, grassland, desert grassland, pinyon-juniper, and aspen.
- Progulske, D. R. and F. J. Shideler. 1991.** Following Custer. South Dakota State Univ. Agr. Exp. Sta. Bull. 674.
Twenty-five pairs, 1874 & 1974–75, mostly coniferous forest with some meadows.
- Progulske, D. R. and R. H. Sowell. 1974.** Yellow ore, yellow hair, yellow pine—a photographic study of a century of forest ecology. South Dakota State Univ. Agr. Exp. Sta. Bull. 616.
Forty-two pairs, 1874 & 1974, mostly coniferous forest with some meadows.
- Reid, E. H., C. G. Johnson Jr., and W. B. Hall. 1991.** Green fescue grassland: 50 years of secondary succession under sheep grazing. USDA For. Serv. PNW R6-F16-SO-0591.
One set of six; 1938, 1944, 1956, 1968, 1978, & 1988. Six sets of four; 1938, 1956, 1978, & 1988. Four trios; 1938, 1956 & 1988. Oregon.
- Reid, E. H., G. S. Stricker, and W. B. Hall. 1980.** Green fescue grassland—40 years of secondary succession. USDA For. Serv. Res. Paper PNW-274.
Three pairs; 1938 & 1956, 1960 or 1978. Three pairs, 1968 & 1978. One trio; 1938, 1944 & 1956. Six trios; 1938, 1956 & 1978. Oregon.
- Reppert, J. N. and R. E. Francis. 1973.** Interpretation of trend in range condition from 3-step data. USDA For. Serv. Res. Paper RM-103.
One set of four; 1954, 1959, 1964, & 1969, meadow. One trio; 1952, 1957 & 1962, sagebrush-grass. Landscape and close-up at each date, Idaho.
- Reynolds, H. G. and J. W. Bohning. 1956.** Effects of burning on a desert grass-shrub range in southern Arizona. *Ecol.* 37:769–777.
One pair, 1903 & 1941; 1 trio, 1952, 1953 & 1954.
- Reynolds, H. G. and S. C. Martin. 1968.** Managing grass-shrub cattle ranges in the Southwest. USDA For. Serv. Agric. Handb. 162.
Two trios; 1919, 1930 & 1948 and 1959, 1962 & 1963. One pair, “18 years apart.” Arizona.
- Rich, L. R. 1961.** Surface runoff and erosion in the lower chaparral zone, Arizona. USDA For. Serv. Rocky Mtn. For. Range Exp. Sta. Paper 66.
Five pairs; 1936 & 1950, 1935–36 & 1953 (3), 1936 & 1960.
- Rickard, W. H. and C. E. Cushing. 1982.** Recovery of streamside woody vegetation after exclusion of livestock grazing. *J. Range Manage.* 35:360–361.
One pair, 1963 & 1980, Washington, aerial.
- Robinett, D. 1990.** Tohono O'odham range history. *Rangelands* 12:296–300.
Three pairs, 1893 & 1983, shrub-grass, Sonora-Arizona border.
- Robinett, D. 1992.** Drought and recovery in the Upper Sonoran Desert. *Rangelands* 14:219–222.
One set of five, 1988 to 1990, color.
- Rogers, G. F. 1982.** Then and now: a photographic history of vegetation change in the Central Great Basin Desert. Univ. Utah Press, Salt Lake City, Utah.
Three trios; first photographed 1901, 1913 or 1917, rephotographed 1968–69 & 1977–78. Forty-six pairs; 1868–69 & 1977–80 (6), 1901 & 1976–80 (20), 1910–16 & 1976–79 (17), 1913 & 1968 (2), 1968 & 1977 (1).
- Rogers, G. F., H. E. Malde, and R. M. Turner. 1984.** Bibliography of repeat photography for evaluating landscape change. Univ. Utah Press, Salt Lake City, Ut.
Four pairs: 1874 & 1975, sandstone monuments, Colorado; 1907 & 1962, desert, Sonora; 1899 & 1977, juniper, New Mexico; 1869 & 1978, sagebrush, Utah. One trio; 1869, 1940 & 1980, Utah. Over 450 entries in bibliography, but many are of cities or glaciers with little natural vegetation visible.
- Schulz, T. T. and W. C. Leininger. 1990.** Differences in riparian vegetation structure between grazed areas and exclosures. *J. Range Manage.* 43:295–299.
One pair, 1949 & 1978, Colorado.
- Sharp, L. A., K. Sanders, and N. Rimbey. 1990.** Forty years of change in a shadscale stand in Idaho. *Rangelands* 12:313–328.
Series of 30; 1951, 1955 & nearly annual from 1958 through 1990, color.
- Sharp, L. A., K. Sanders, and N. Rimbey. 1992.** Variability of crested wheatgrass production over 35 years. *Rangelands* 14:153–168.
Series of 29; annually 1957 through 1991 except 1958, 1962, 1970, 1972, 1981, and 1985; Idaho.
- Shideler, F. J. 1973.** Custer country—one hundred years of change. *Amer. West* 19(4):25–31.
Four pairs, refers to Progulske (1974).
- Shinn, D. A. 1980.** Historical perspectives on range burning in the Inland Pacific Northwest. *J. Range Manage.* 33:415–423.
Three pairs; 1900 & 1976 and “early 1930's” & 1976. One set of four; 1920, 1945, 1956, & 1976. Juniper-sagebrush-grass, Oregon.
- Shoemaker, E. M. and H. G. Stephens. 1975.** First photographs of the Canyon Lands, p. 111–222. *In:* J. E. Fassett (ed.) *Canyonlands Country*. Four Corners Geol. Soc. 8th Field Cong. Guidebook.
Ten pairs, 1871–72 & 1968.
- Simmons, N. M. 1966.** Flora of the Cabeza Prieta Game Range. *J. Arizona Acad. Sci.* 4(2):93–104.
Four pairs, 1894 and ca. 1964, Arizona.
- Skovlin, J. M. 1991.** Fifty years of research progress: A historical document on the Starkey Experimental Forest and Range. USDA For. Serv. Gen. Tech. Rep. PNW-GTR-266.
One pair; 1939 & 1989, riparian, and one trio; 1939, 1949 & 1989, meadow; Oregon.
- Steenbergh, W. F. and C. H. Lowe Jr. 1983.** Ecology of the saguaro. III. Growth and demography. US Dept. Int. Natl. Park Serv. Sci. Monogr. Ser. 17.
Three pairs, 1941 & 1979; 1 pair, 1941 & 1969; 1 pair 1971 & 1979.
- Stephens, H. G. and E. M. Shoemaker. 1987.** In the footsteps of John Wesley Powell: an album of comparative photographs of the Green and Colorado Rivers, 1871–72 and 1968. Johnson Books, Boulder, Colo. and the Powell Society, Denver, Colo.
One hundred ten pairs, 1871–72 and 1968–69; not all show vegetation.
- Stickney, P. F. 1986.** First decade plant succession following the Sundance forest fire, northern Idaho. USDA For. Serv. Gen. Tech. Rep. INT-197.
Five sets of eight; annually 1967 through 1977 except 1972, 1974 & 1976.
- Strickler, G. S. 1961.** Vegetation and soil condition changes on a sub-alpine grassland in eastern Oregon. USDA For. Serv. Res. Paper PNW-40.
Sixteen pairs, 1938 & 1956.
- Strickler, G. S. and W. B. Hall. 1980.** The Standley allotment—a history of range recovery. USDA For. Serv. Res. Paper PNW-278.
One pair, 1909 & 1966; 3 pairs, 1907–09 & 1976; 7 pairs, 1907–10 & 1973. 2 trios; 1907–08, 1955 & 1973. One set of five; 1907, 1909, 1911, 1955, & 1976. Sub-alpine grasslands, Oregon.
- Sturges, D. L. 1993.** Soil-water and vegetation dynamics through 20 years after big sagebrush control. *J. Range Manage.* 46:161–169.
Two pairs, 1969 & 1990, Sagebrush-grass, Wyoming.

- Timothy, K. 1980.** Jarbidge Ranger District—it can be done. *Rangelands* 2:160–161.
Two pairs, 1909 & 1978 and 1919 & 1977, mountain meadows, Nevada.
- Tixier, S. and D. Nebeker. 1988.** “Range war” on Hobbler Creek Allotment. *Rangelands* 10:227–229.
Three pairs; first photographed 1954, 1955 or 1961, rephotographed 1987. Meadows, Utah.
- Tohill, A. and J. Dollerschell. 1990.** “Livestock” the key to resource improvement on public lands. *Rangelands* 12:329–336.
Five pairs; 3 months to 2 years recovery after intensive use under Savory Grazing Method, color, riparian and sagebrush-grass, Colorado.
- Tschirley, F. H. and S. C. Martin. 1961.** Burweed on southern Arizona range lands. *Univ. Arizona Agr. Exp. Sta. Tech. Bull.* 146.
One set of four, 1922 through 1958.
- Tschirley, F. H. and R. F. Wagler. 1964.** Growth rate and population dynamics of jumping cholla (*Opuntia fulgida* Engelm.) *J. Arizona Acad. Sci.* 3(2):67–71.
One set of five, 1903 through 1960.
- Tueller, P. T., P. C. Lent, R. D. Stager, E. A. Jacobsen, and K. A. Platou. 1988.** Rangeland vegetation changes measured from helicopter-borne 35-mm aerial photography. *Photogram. Engin. Remote Sens.* 54:609–614.
One pair, 1981 & 1985, sagebrush-grass, Nevada, color.
- Turner, R. M. 1990.** Long-term vegetation change at a fully protected Sonoran Desert site. *Ecol.* 71:464–477.
One set of four; 1907, 1959, 1972, & 1984. One pair, 1959 & 1984.
- Turner, R. M. and M. M. Karpiscak. 1980.** Recent vegetation changes along the Colorado River between Glen Canyon Dam and Lake Mead, Arizona. *US Geol. Surv. Prof. Paper* 1132.
Two trios; 1952, 1963–65 & 1972–73. Forty-five pairs; first photographed 1872–73 (8), 1889–90 (5), 1901–03 (3), 1923 (25), 1950–52 (3) or 1973 (1); rephotographed 1972–76. One pair, 1952 & 1963.
- Turner, R. M., L. H. Applegate, P. M. Bergthold, S. Gallizoli, and S. C. Martin. 1980.** Arizona range reference areas. *USDA For. Serv. Gen. Tech. Rep.* RM-79.
Three pairs; 1905 & 1961, 1906 & 1978, 1929 & 1978. One trio 1930, ? & 1978. Enclosures, shrub-grass.
- Urness, P. J. and C. H. Jensen. 1983.** Goat use in fall increases bitterbrush browse and reduces sagebrush density, p. 186–194. *In: A. R. Tiedemann and K. L. Johnson (comps.) Research and management of bitterbrush and cliffrose in western North America.* *USDA For. Serv. Gen. Tech. Rep.* INT-152.
One pair, 1979 & 1981, shrub-grass, Utah.
- Vale, T. R. 1978.** The sagebrush landscape. *Landscape* 22(2):31–37.
Two pairs; 1870 & 1972, Wyoming, and 1872 & 1972, Idaho.
- Vale, T. R. 1987.** Vegetation change and park purposes in the high elevations of Yosemite National Park, California. *Ann. Assoc. Amer. Geogr.* 77:1–18.
Two pairs, 1903 & 1984–85; 3 pairs, 1907 & 1984–85. Alpine, coniferous forest, meadow.
- Vankat, J. L. and J. Major. 1978.** Vegetation changes in Sequoia National Park, California. *J. Biogeogr.* 5:377–402.
Five pairs; first photographed “1880’s”, oak woodland; 1900, coniferous forest and chaparral; 1903, meadow; or 1912, subalpine; rephotographed 1976–77. Over 300 sites were rephotographed but not published.
- Veblen, T. T. and D. C. Lorenz. 1991.** The Colorado Front Range: a century of ecological change. *Univ. Utah Press, Salt Lake City, Ut.*
Sixty-nine pairs; first photographed 1870 (1), 1885 (1), 1890 (1), 1897–1902 (20), 1905 (18), 1909–10 (5), 1915–17 (17), 1920–21 (6); rephotographed 1984–85. Coniferous forest and meadows; some inside and some outside Rocky Mountain National Park.
- Weaver, H. 1957.** Effects of prescribed burning in ponderosa pine. *J. For.* 55:133–138.
Two pairs, 1943 & 1955, Washington.
- Weaver, H. 1959.** Ecological changes in the ponderosa pine forest of the Warm Springs Indian Reservation in Oregon. *J. For.* 57:15–20.
One pair, 1939 & 1957.
- Weaver, H. 1967.** Some effects of prescribed burning in the Coyote Creek test area, Colville Indian Reservation. *J. For.* 65:552–558.
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