

Cache la Poudre and South Platte River Degradations: Cumulative Basin Impacts

When: Where: Map: What: Who: Link(s): Citation: Graphics:
When: prior to 1860 Where: Upper Poudre Map: 1 What: Beavers trapped out by 1860, adding to sediment mobility, fostering flooding, and reducing streamside diversity Who: Wohl (2005) Link(s): http://www.ecologyandsociety.org/vol10/iss2/art2/ES-2005-1339.pdf Citation: Graphics: NA
When: About 1860 Where: Poudre and other Front Range drainages Map: 32 What: Greenback cutthroat trout almost wiped out through a combination of causes, including: mining-related sand, silt and heavy metals; tie cutting and tie drive destruction of wintering pools; sawdust from timber mills; overgrazing; water diversions; and competition from non-native trout. Who: NA Link(s): NA Citation: Fausch, K.D. 2015. For the Love of Rivers. Oregon State University Press. Corvallis. 280 pp. Graphics: NA

<p>When: since 1860</p> <p>Where: Poudre River between South Taft Hill Road in Fort Collins and I-25</p> <p>Map: 24</p> <p>What: Diversions, construction of upstream dams, alluvial aggregate mining, stream channelization and introduction of non-native species have reduced flooding events, both rainfall and snowmelt, and collectively impacted the sustainability of riparian forests</p> <p>Who: Ayres and Associates (2008)</p> <p>Link(s): http://www.fcgov.com/nispreview/pdf/ayres_preliminary_report.pdf and http://www.fcgov.com/nispreview/pdf/white_paper.pdf</p> <p>Citation: Ayres Associates, 2008. Preliminary identification of potential impacts of Glade reservoir on the Cache la Poudre River from Overland Trail to Interstate 25. Ayres Project No. 32-0700.08. Fort Collins, Colorado. 30 pp plus appendix and Scott M., Shafroth P., and G. Auble, 1999. Responses of Riparian Cottonwoods to Alluvial Water Table Declines. Environmental Management. Vol 7, pp 347-358.</p> <p>Graphics: NA</p>
<p>When: by 1885</p> <p>Where: Poudre and S. Platte</p> <p>Map: 3</p> <p>What: Summer river flows “overappropriated” for irrigation</p> <p>Who: Strange et al. (1999)</p> <p>Link(s): http://www.springerlink.com/content/ufheul6ma97rkkf1/</p> <p>Citation: Strange, E. M., K. D. Fausch, and A. P. Covich, 1999. Sustaining Ecosystem Services in Human-Dominated Watersheds: Biohydrology and Ecosystem Processes in the South Platte River Basin. Environmental Management, 24(1):39-54.</p> <p>Graphics: NA</p>
<p>When: by 1870</p> <p>Where: Upper Poudre</p> <p>Map: 1</p> <p>What: More than 200,000 railroad ties annually between 1868-1870 scour channel and banks</p> <p>Who: Wohl (2005)</p> <p>Link(s): http://www.ecologyandsociety.org/vol10/iss2/art2/ES-2005-1339.pdf</p> <p>Citation:</p> <p>Graphics: Snap10.jpg</p>
<p>When: 1891</p> <p>Where: Poudre River, Chambers Lake downstream</p> <p>Map: 2</p> <p>What: Chambers Lake dam break floods Fort Collins</p> <p>Who:</p> <p>Link(s): http://www.fcgov.com/utilities/what-we-do/stormwater/drainage-basins/poudre-river</p> <p>Citation:</p> <p>Graphics: NA</p>

When: 1895

Where: Wet meadow east of Poudre River

Map: 26

What: Extirpation of the Colorado Butterfly Plant (*Gaura neomexicana* ssp. *Coloradensis*), last documented along the south-east Poudre River corridor within present day Fort Collins. A search in 1984 by E. Neese failed to find the plant, presumed extirpated. A host of other rare and potentially vulnerable (but at present unprotected) plants have been found in natural areas managed by the City of Fort Collins, including: (a) Sterling - 1 rare wetland-related plant ; (b) McMurry - 3 rare plants, 2 river-related and 1 gravel pond-related; (c) Magpie Meander - 2 rare plants, 1 river-related and the other more of an upland plant; (d) Springer - 2 rare river-related plants; (e) Kingfisher Point - 1 river-related plant ; (f) Riverbend Ponds - 4 rare wetland-related plants; (g) Running Deer - 1 rare wetland-related plant; (h) Cattail Chorus - 1 rare river-related plant ; (i) Arapaho Bend - 1 rare river-related plant .

Who: Crystal Strouse, City of Fort Collins, citing Colorado Natural Heritage Program records, personal communication, 2011.

Link(s):

<http://www.uwyo.edu/wynddsupport/docs/Reports/WYNDDReports/U00FER03WYUS.pdf>

Citation: Fertig, W. 2000. Status Review of the Colorado Butterfly Plant (*Gaura neomexicana* ssp. *Coloradensis*), Wyoming Natural Diversity Database, University of Wyoming, Larime, WY. 23 pp.

Graphics: [Snap18.gif](#), [Documented-Rare-Plants-of-the-Natural-Areas.jpg](#)

When: circa 1930

Where: Poudre, Fort Collins to Greeley

Map: 4

What: Disappearance of cold water fishery

Who: Geffs (1938), as reported in Bartholow (1991)

Link(s): <http://www.fort.usgs.gov/Products/Publications/4061/4061.pdf>

Citation:

Graphics: NA

When: 1930

Where: Greeley to Nebraska

Map: 5

What: Drought of 1930s combined with diversions allows vegetative encroachment of the channel, converting multiple braids into a single, narrow main channel

Who: Strange et al. (1999)

Link(s): <http://www.icsu-scope.org/downloadpubs/scope35/chapter12.html> and <http://pubs.usgs.gov/circ/circ1167/circ1167.pdf>

Citation: Strange, E. M., K. D. Fausch, and A. P. Covich, 1999. Sustaining Ecosystem Services in Human-Dominated Watersheds: Biohydrology and Ecosystem Processes in the South Platte River Basin. *Environmental Management*, 24(1):39-54.

Graphics: [Snap3.gif](#)

When: since 1930

Where: whole basin below foothills

Map: 6

What: Cottonwood stands gradually invaded by shade-tolerant exotics that are favored by changes in timing, magnitude, and duration of peak flows and elevated summer base flows, establishing a new successional pathway

Who: Strange et al. (1999)

Link(s): <http://www.springerlink.com/content/ufheul6ma97rkkf1/>

Citation: Strange, E. M., K. D. Fausch, and A. P. Covich, 1999. Sustaining Ecosystem Services in Human-Dominated Watersheds: Biohydrology and Ecosystem Processes in the South Platte River Basin. *Environmental Management*, 24(1):39-54.

Graphics: NA

When: since 1937

Where: Poudre River between South Taft Hill Road in Fort Collins and I-25

Map: 24

What: Significant degradation of river and floodplain, including channel narrowing, straightening (some to facilitate gravel mining, all reducing meandering), reduction in sand and gravel bars (including mid-channel and point bars, now often vegetated or silted over), reduction in evident oxbows and meander scrolls (often by urban encroachment), and apparent reduction in overbank flow paths and channels, all caused, at least in part, by flow pattern and sediment supply changes.

Who: Ayres and Associates (2008)

Link(s): http://www.fcgov.com/nispreview/pdf/ayres_preliminary_report.pdf

Citation: Ayres Associates, 2008. Preliminary identification of potential impacts of Glade reservoir on the Cache la Poudre River from Overland Trail to Interstate 25. Ayres Project No. 32-0700.08. Fort Collins, Colorado. 30 pp plus appendix.

Graphics: Ayres.jpg

When: about 1939

Where: South Platte below Denver wastewater treatment facilities

Map: 15 (approximately)

What: The Denver Water Board imported west slope water and delivered it down Clear Creek to its confluence with the S. Platte, in part, to dilute wastewater that was being used to irrigate vegetables. These vegetables were being contaminated by excessive "filth" and were being boycotted by neighboring states.

Who: City of Denver

Link(s): NA

Citation: Limerick, P. 2012. *A Ditch in Time: the city, the west, and water*. Fulcrum Publishing, Golden Colorado. Page 120 and footnote 29.

Graphics: NA

When: circa 1950s

Where: Just north of the Poudre River as it exits the canyon.

Map: 27

What: Atlas and Titan intercontinental ballistic missile silo adjacent to the Poudre River has contaminated the groundwater with trichloroethylene, or TCE, This dangerous chemical can cause nervous system problems, liver and lung damage, abnormal heartbeat, coma and death, according to the Department of Health and Human Services' Agency for Toxic Substances and Disease Registry, or may also cause cancer, One proposed reservoir (Glade) would partly cover the site and could contaminate the Poudre River and municipal water supplies downstream as the plume is hastened toward the river by hydraulic pressure.

Who: Various

Link(s): <http://www.savethepoudre.org/news-articles/pollution-lingers-at-old-missile-sites-Time-2009-10-16.pdf>

Citation:

Graphics: NA

When: Circa 1950

Where: S. Platte River near confluence with Platte

Map: 7

What: Serious decline in Whooping Crane populations due to habitat alteration, both in and out of rivers, primarily the loss of remaining wetland habitat given agricultural drainage

Who:

Link(s): http://www.nap.edu/openbook.php?record_id=10978&page=155 and

[https://nwf.org/News-and-Magazines/Media-](https://nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2007/~media/PDFs/Wildlife/WhoopingCrane-west.ashx)

[Center/Reports/Archive/2007/~media/PDFs/Wildlife/WhoopingCrane-west.ashx](https://nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2007/~media/PDFs/Wildlife/WhoopingCrane-west.ashx)

Citation:

Graphics: Crane16.jpg

When: circa 1963

Where: Poudre, Greeley

Map: 8

What: Flooding due to sediment buildup

Who: Army Corps of Engineers

Link(s): [https://www.nwo.usace.army.mil/html/pd-p/greeley/905\(b\)report-](https://www.nwo.usace.army.mil/html/pd-p/greeley/905(b)report-Jul04modified23.pdf)

[Jul04modified23.pdf](https://www.nwo.usace.army.mil/html/pd-p/greeley/905(b)report-Jul04modified23.pdf)

Citation:

Graphics: Snap1.jpg

When: 1965

Where: South Platte below Greeley

Map: 9

What: US Public Health Department reports "Below Greeley the river is polluted throughout the year. There are extensive sludge deposits and the river has a gray, septic appearance."

Who: OtterTail Environmental (2009)

Link(s):

<http://www.greeleygov.com/PublicWorks/Documents/Literature%20Review%20and%20historicaldata.pdf>

Citation: OtterTail Environmental, Inc. 2009a. Literature Review and Historical Data Survey for Cache la Poudre River General Investigation Study Flood Control/Environmental Restoration Project. Unpublished technical report prepared for the U.S. Army Corps of Engineers, Omaha District. 19 pages plus appendices.

Graphics: NA

When: 1972

Where: Poudre downstream of Greeley

Map: 10

What: Total and fecal coliform concentrations were two orders of magnitude greater than those above the wastewater treatment plant. The Poudre was characterized as the most severe case of surface water pollution in the entire South Platte River Basin, with the river listed as "virtually an open sewer" full of sludge worms.

Who: OtterTail Environmental (2009)

Link(s):

<http://www.greeleygov.com/PublicWorks/Documents/Literature%20Review%20and%20historicaldata.pdf>

Citation: OtterTail Environmental, Inc. 2009a. Literature Review and Historical Data Survey for Cache la Poudre River General Investigation Study Flood Control/Environmental Restoration Project. Unpublished technical report prepared for the U.S. Army Corps of Engineers, Omaha District. 19 pages plus appendices.

Graphics: NA

When: 1978

Where: S. Platte near Colorado-Nebraska line

Map: 11

What: Crouch (1979) documents decline in poplar abundance and health along grazed and ungrazed portions of the river, attributed to failure of seedling replacement due to upstream river damming and other factors

Who: Rood and Mahoney (1990)

Link(s): <http://www.springerlink.com/content/160466q913410101/>

Citation: Rood, S.B. and J.M. Mahoney. 1990. Collapse of riparian poplar forests downstream from dams in western prairies: Probable causes and prospects for mitigation. *Environmental Management* 14:451-464.

Graphics: NA

When: 1980s

Where: Upper Poudre, especially near hatchery

Map: 1

What: Whirling disease parasite all but wipes out rainbow trout in rivers including the Poudre that have been harmed by low flows, excess sediment deposition, and elevated water temperatures.

Who:

Link(s):

<http://parks.state.co.us/SiteCollectionImages/parks/Programs/ParksResourceStewardship/Whirling%20Disease%20Information.pdf>

Citation:

Graphics: WhirlingTrout.jpg

When: 1983

Where: Urban reach of the Poudre through Fort Collins and probably elsewhere downstream

Map: 26

What: The last time cottonwoods naturally established to any extent along the urban reach was following the 1983 flood. While most of the cottonwoods along the urban reach are older than this (the life span of cottonwoods in this region is generally over 100 years), experts expect most of the older individuals to die back within this century. The lack of new seedling recruitment suggest that cottonwood forests along the Poudre will slowly revert to other vegetation types, many of which may not be native or desirable. A lower water table in the spring can significantly impact cottonwoods because this time is critical to leafing out and the annual growth period for the cottonwoods.

Who: City of Fort Collins

Link(s): http://www.fcgov.com/nispreview/pdf/white_paper.pdf

Citation: City of Fort Collins Staff, April 2008. Characterizing the Cache La Poudre River: Past, Present, and Future: A summary of key findings by the Poudre Technical Advisory Group. 14 pp.

Graphics: NA

When: 1986

Where: Lower S. Platte

Map: 9

What: 90% of the 82 breeding bird species currently present were not in the region at the turn of the century, thought to be due to expanded cottonwood forests allowing more generalist species to invade.

Who: Strange et al. (1999)

Link(s): <http://www.springerlink.com/content/ufheul6ma97rkkf1/>

Citation: Strange, E. M., K. D. Fausch, and A. P. Covich, 1999. Sustaining Ecosystem Services in Human-Dominated Watersheds: Biohydrology and Ecosystem Processes in the South Platte River Basin. Environmental Management, 24(1):39-54.

Graphics: NA

When: by 1986

Where: lower S. Platte

Map: 9

What: riparian habitats have been so extensively modified that at least four bird species have been lost through hybridization with non-natives

Who: Strange et al. (1999)

Link(s): <http://www.springerlink.com/content/ufheul6ma97rkkf1/>

Citation: Strange, E. M., K. D. Fausch, and A. P. Covich, 1999. Sustaining Ecosystem Services in Human-Dominated Watersheds: Biohydrology and Ecosystem Processes in the South Platte River Basin. *Environmental Management*, 24(1):39-54.

Graphics: NA

When: 1989

Where: Southern metro Denver

Map: 25

What: Water levels in one of the four major aquifers, the Arapahoe aquifer, have dropped 700-800 feet

Who: Strange et al. (1999)

Link(s): <http://www.springerlink.com/content/ufheul6ma97rkkf1/> and http://pubs.usgs.gov/ha/ha730/ch_c/C-text6.html

Citation: Strange, E. M., K. D. Fausch, and A. P. Covich, 1999. Sustaining Ecosystem Services in Human-Dominated Watersheds: Biohydrology and Ecosystem Processes in the South Platte River Basin. *Environmental Management*, 24(1):39-54.

Graphics: CO80.jpg

When: 1994

Where: Poudre upstream of Greeley

Map: 12

What: US Fish and Wildlife documents two plant species listed as threatened or endangered: Colorado butterfly plant and Ute laides'-tresses orchid in vicinity

Who: OtterTail Environmental (2009)

Link(s):

<http://www.greeleygov.com/PublicWorks/Documents/Literature%20Review%20and%20historicaldata.pdf>

Citation: OtterTail Environmental, Inc. 2009a. Literature Review and Historical Data Survey for Cache la Poudre River General Investigation Study Flood Control/Environmental Restoration Project. Unpublished technical report prepared for the U.S. Army Corps of Engineers, Omaha District. 19 pages plus appendices.

Graphics: NA

When: 1994

Where: Poudre between Kodak (Windsor) and S. Platte

Map: 13

What: Colorado Division of Wildlife documents T&E or special concern species: northern redbelly dace, brassy minnow, Iowa darter, northern cricket frog, northern leopard frog, and papershell mollusk as well as river otters

Who: OtterTail Environmental (2009)

Link(s):

<http://www.greeleygov.com/PublicWorks/Documents/Literature%20Review%20and%20historicaldata.pdf>

Citation: OtterTail Environmental, Inc. 2009a. Literature Review and Historical Data Survey for Cache la Poudre River General Investigation Study Flood Control/Environmental Restoration Project. Unpublished technical report prepared for the U.S. Army Corps of Engineers, Omaha District. 19 pages plus appendices.

Graphics: NA

When: 1994

Where: Poudre River below foothills, mostly near Kodak plant

Map: 14

What: Environmental Working Group describes the Poudre as “the most polluted river in Colorado” documenting 356,000 pounds of toxic chemicals dumped in, including ammonia, glycol ethers, glycol methanol, silver, and manganese compounds

Who: OtterTail Environmental (2009)

Link(s):

<http://www.greeleygov.com/PublicWorks/Documents/Literature%20Review%20and%20historicaldata.pdf>

Citation: OtterTail Environmental, Inc. 2009a. Literature Review and Historical Data Survey for Cache la Poudre River General Investigation Study Flood Control/Environmental Restoration Project. Unpublished technical report prepared for the U.S. Army Corps of Engineers, Omaha District. 19 pages plus appendices.

Graphics: NA

When: 1995

Where: S. Platte (especially between Balzac and Henderson)

Map: 15

What: The river has the highest ammonia and nitrate concentration and the second highest phosphorus concentration among 20 major rivers sampled by USGS, all leading to water quality violations.

Who: Strange et al. (1999)

Link(s): <http://www.springerlink.com/content/ufheul6ma97rkkf1/>

Citation: Strange, E. M., K. D. Fausch, and A. P. Covich, 1999. Sustaining Ecosystem Services in Human-Dominated Watersheds: Biohydrology and Ecosystem Processes in the South Platte River Basin. *Environmental Management*, 24(1):39-54.

Graphics: NA

When: 1995

Where: S. Platte, between Denver and Julesburg, especially Fort Morgan area

Map: 16

What: Blue Baby syndrome (excess nitrates in drinking water) plagues 35% of domestic water wells and Fort Morgan municipal wells

Who: Strange et al. (1999)

Link(s): <http://www.springerlink.com/content/ufheul6ma97rkkf1/> and

http://www.fortmorgantimes.com/ci_15133974 and

<http://www.cwi.colostate.edu/publications/sr/16.pdf>

Citation: Strange, E. M., K. D. Fausch, and A. P. Covich, 1999. Sustaining Ecosystem Services in Human-Dominated Watersheds: Biohydrology and Ecosystem Processes in the South Platte River Basin. *Environmental Management*, 24(1):39-54.

Citation:

Graphics: BlueBaby.jpg (also see Snap6.gif, Snap7.jpg, Snap11.gif, and Snap12.gif, and Snap14.gif)

When: 1995

Where: S. Platte near Henderson

Map: 17

What: native riparian vegetation loss was associated with increased algal abundance and loss of number and diversity of benthic macroinvertebrates

Who: Strange et al. (1999)

Link(s): <http://www.springerlink.com/content/ufheul6ma97rkkf1/>

Citation: Strange, E. M., K. D. Fausch, and A. P. Covich, 1999. Sustaining Ecosystem Services in Human-Dominated Watersheds: Biohydrology and Ecosystem Processes in the South Platte River Basin. *Environmental Management*, 24(1):39-54.

Graphics: NA

When: 1996

Where: Whole basin below foothills

Map: 6

What: Agriculture contributes 132,000 tons of nitrogen and 14,000 tons of phosphorus annually, and manure from feedlots contributes another 94,000 tons of nitrogen and 26,000 tons of phosphorus. Wastewater treatment also contributes 7,000 tons of nitrogen and 1,200 tons of phosphorus directly into the river, posing major problems in urban areas.

Who: Strange et al. (1999)

Link(s): <http://www.springerlink.com/content/ufheul6ma97rkkf1/>

Citation: Strange, E. M., K. D. Fausch, and A. P. Covich, 1999. Sustaining Ecosystem Services in Human-Dominated Watersheds: Biohydrology and Ecosystem Processes in the South Platte River Basin. *Environmental Management*, 24(1):39-54.

Graphics: DenWWTP-001w.jpg

<p>When: 1996 Where: Below Halligan Dam on the North Fork of the Poudre Map: 18 What: Sediment release kills fish for about 10 miles downstream from dam Who: North Poudre Irrigation Company Link(s): http://www.biohabitats.com/ndg_newsite/newsletter/2009winter/interview1.php Citation: Graphics: Halligan.jpg</p>
<p>When: 1996 Where: Lower Poudre and S. Platte Map: 3 What: subsurface irrigation return flow is a major nonpoint source of nitrate, dissolved solids, and pesticides in the South Platte River's lower reaches Who: Dennehey <i>et al.</i> (1998) Link(s): http://pubs.usgs.gov/circ/circ1167/circ1167.pdf and http://www.cwi.colostate.edu/publications/sr/16.pdf Citation: Dennehy, K.F., D.W. Litke, C.M. Tate, S.L. Qi, P.B. McMahon, B.W. Bruce, R.A. Kimbrough, and J.S. Heiny, 1998. Water quality in the South Platte River Basin, Colorado, Nebraska, and Wyoming. U.S. Geological Survey Circular 1167, 38 p. Graphics: Snap2.gif, Snap13.gif, and Snap15.gif</p>
<p>When: 1997 Where: S. Platte Map: 5 What: flow regime modification has resulted in declines of six native fish species considered for listing as Threatened or Endangered, and establishment of 18 exotics Who: Strange <i>et al.</i> (1999) Link(s): http://www.springerlink.com/content/ufheul6ma97rkkf1/ Citation: Strange, E. M., K. D. Fausch, and A. P. Covich, 1999. Sustaining Ecosystem Services in Human-Dominated Watersheds: Biohydrology and Ecosystem Processes in the South Platte River Basin. <i>Environmental Management</i>, 24(1):39-54. Graphics: NA</p>
<p>When: 1998 Where: Lower Poudre and S. Platte Map: 6 What: wastewater treatment plant effluent contributes large loads of phosphorous, nitrate, and ammonia Who: Dennehey <i>et al.</i> (1998) Link(s): http://pubs.usgs.gov/circ/circ1167/circ1167.pdf Citation: Dennehy, K.F., D.W. Litke, C.M. Tate, S.L. Qi, P.B. McMahon, B.W. Bruce, R.A. Kimbrough, and J.S. Heiny, 1998. Water quality in the South Platte River Basin, Colorado, Nebraska, and Wyoming. U.S. Geological Survey Circular 1167, 38 p. Graphics: Snap9.jpg</p>

<p>When: 1998</p> <p>Where: Lower Poudre and S. Platte</p> <p>Map: 3</p> <p>What: large diversions in the basin result in less dilution for measured contaminants, which now violate EPA's aquatic life criteria</p> <p>Who: Dennehey <i>et al.</i> (1998)</p> <p>Link(s): http://pubs.usgs.gov/circ/circ1167/circ1167.pdf</p> <p>Citation: Dennehy, K.F., D.W. Litke, C.M. Tate, S.L. Qi, P.B. McMahon, B.W. Bruce, R.A. Kimbrough, and J.S. Heiny, 1998. Water quality in the South Platte River Basin, Colorado, Nebraska, and Wyoming. U.S. Geological Survey Circular 1167, 38 p.</p> <p>Graphics: Snap8.jpg</p>
<p>When: 1998</p> <p>Where: Lower Poudre and S. Platte</p> <p>Map: 3</p> <p>What: Surface and ground water reuse has increased salinity in the lower South Platte River and surrounding alluvial aquifer, negatively affecting both irrigation and drinking-water supplies</p> <p>Who: Dennehey <i>et al.</i> (1998)</p> <p>Link(s): http://pubs.usgs.gov/circ/circ1167/circ1167.pdf</p> <p>Citation: Dennehy, K.F., D.W. Litke, C.M. Tate, S.L. Qi, P.B. McMahon, B.W. Bruce, R.A. Kimbrough, and J.S. Heiny, 1998. Water quality in the South Platte River Basin, Colorado, Nebraska, and Wyoming. U.S. Geological Survey Circular 1167, 38 p.</p> <p>Graphics: Snap4.gif</p>
<p>When: 1998</p> <p>Where: S. Platte basin, primarily in urban areas</p> <p>Map: 19</p> <p>What: Organochlorine pesticides and PCBs in bed sediment and fish tissue exceed NAS guidelines</p> <p>Who: Dennehey <i>et al.</i> (1998)</p> <p>Link(s): http://pubs.usgs.gov/circ/circ1167/circ1167.pdf</p> <p>Citation: Dennehy, K.F., D.W. Litke, C.M. Tate, S.L. Qi, P.B. McMahon, B.W. Bruce, R.A. Kimbrough, and J.S. Heiny, 1998. Water quality in the South Platte River Basin, Colorado, Nebraska, and Wyoming. U.S. Geological Survey Circular 1167, 38 p.</p> <p>Graphics: Snap5.gif</p>

When: 2000

Where: Overland Trail to I-25

Map: 24

What: The river's physical environment is becoming increasingly well-suited for filamentous algae common to stillwater habitats. These algal species "choke out" native flora and reduce dissolved oxygen. Only about 1 one quarter the number of native aquatic insects that once occupied the urban reach remain today.

Who: Fort Collins summary of findings by the Technical Advisory Group

Link(s): http://www.fcgov.com/nispreview/pdf/white_paper.pdf

Citation:

Graphics:

NAWhen: 2000

Where: Lower Poudre & S. Platte

Map: 3

What: Elevated salinity levels impact crop yields

Who: Haby and Loftis (2000)

Link(s): <http://cedb.asce.org/cgi/WWWdisplay.cgi?0002068> and

<http://savethepoudre.org/the-farm-truth.html>

Citation: Haby, P.A., and Loftis, J.C., 2000, Salinity Characterization and Source Assessment in the South Platte River Basin, Northeastern Colorado, in Watershed Management 2000 - Science and Engineering Technology for the New Millennium, Fort Collins, CO, American Society of Civil Engineers.

Graphics: NA

When: 2001

Where: Poudre in Greeley

Map: 20

What: 2000 frogs and fish die from an unknown spill of organic matter, possibly animal feces, which depleted the river of oxygen.

Who: OtterTail Environmental (2009)

Link(s):

<http://www.greeleygov.com/PublicWorks/Documents/Literature%20Review%20and%20historicaldata.pdf>

Citation: OtterTail Environmental, Inc. 2009a. Literature Review and Historical Data Survey for Cache la Poudre River General Investigation Study Flood Control/Environmental Restoration Project. Unpublished technical report prepared for the U.S. Army Corps of Engineers, Omaha District. 19 pages plus appendices.

Graphics: NA

When: 2002 and earlier

Where: Fort Collins Aztlan Center and surrounding area

Map: 26

What: Brownfield site found to be oozing coal tar and other semi-volatile hazardous contaminants. Found at elevated levels in soil and groundwater were naphthalene, benzo(a) pyrene and other PAHs. Volatile contaminants found at elevated levels in site soil and groundwater include: benzene, toluene, ethylbenzene, xylene (BTEX), methyl tertiary butyl ether (MTBE), and chlorinated solvents such as tetrachloroethene (PCE) and cis-1,2-dichloroethene (cis 1,2 DCE). Site has history of uncontrolled landfill, coal gasification, and leaking underground storage tanks. Considerable expense to remedy, at least temporarily, the situation.

Who: USEPA

Link(s): <http://www.fcgov.com/advanceplanning/brownfield/pdf/final-far.pdf>

Citation:

Graphics: NA

When: 2003

Where: Poudre River between Fort Collins and S. Platte

Map: 4

What: Human and veterinary antibiotics found to be accumulating at “environmentally relevant concentrations”

Who: Yang and Carlson (2003)

Link(s): <http://www.ncbi.nlm.nih.gov/pubmed/14568051>

Citation: Yang, S.; Carlson, K. (2003) Evolution of Antibiotic Occurrence in a River through Pristine,

Urban and Agricultural Landscapes. Water Res, 37 (19), 4645-4656.

Graphics: NA

When: 2004

Where: South Platte River below Denver’s largest sewage treatment plant

Map: 17

What: White suckers sampled from the river consistently exhibit both male and female sex tissues. These deformities likely are cause from gender-bending hormones or compounds that mimic these hormones. Several downstream communities pull drinking water from the river or groundwater from wells also supported by the river. These include Thornton, Brighton, Gilcrest, and Platteville, as well as the Morgan County Water Quality District. Similar fish were also found in Boulder Creek below another wastewater treatment facility.

Who: Theo Stein and Miles Moffeit, Denver Post Staff Writers

Link(s): <http://www.jcaa.org/jcnl0411/MutantFish.htm>

Citation: Stein, Theo and Miles Moffeit. October 03, 2004. **Denver Post**: Mutant fish prompt concern, Study focuses on sewage plants. Pp 1A and 18A.

Graphics: NA

When: 2004

Where: Poudre west of Greeley

Map: 12

What: Colorado Division of Wildlife documents loss of native species and declining fish species diversity likely due to increasing water temperature, degradation of water quality, altered flow regimes, loss of spawning habitat and presence of migration barriers.

Who: OtterTail Environmental (2009)

Link(s):

<http://www.greeleygov.com/PublicWorks/Documents/Literature%20Review%20and%20historicaldata.pdf>

Citation: OtterTail Environmental, Inc. 2009a. Literature Review and Historical Data Survey for Cache la Poudre River General Investigation Study Flood Control/Environmental Restoration Project. Unpublished technical report prepared for the U.S. Army Corps of Engineers, Omaha District. 19 pages plus appendices.

Graphics: NA

When: 2005

Where: Poudre between Fort Collins and Timnath

Map: 21

What: Benthic macroinvertebrates negatively affected by urban land use and water quality in 10-year data set

Who: Voelz et al. (2005)

Link(s): http://www.fort.usgs.gov/Products/Publications/pub_abstract.asp?PubID=22090

Citation: Voelz, N.J., R.E. Zuellig, S. Shieh, and J.V. Ward. 2005. The effects of urban areas on benthic macroinvertebrates in two Colorado plains rivers. Environmental Monitoring and Assessment 101: 175-202.

Graphics: NA

When: 2006

Where: Poudre from Fort Collins to S. Platte

Map: 4

What: Antibiotics in river and sediment traced to confined animal operations

Who: Kim and Carlson (2006)

Link(s): <http://www.ncbi.nlm.nih.gov/pubmed/16790258>

Citation: Kim, S.C. and K. Carlson. 2006. Occurrence of ionophore antibiotics in water and sediments of a mixed-landscape watershed. Water Res. 40:2549–2560.

Graphics: NA

When: 2008 (funding begins)

Where: South Platte River 100-year floodplain in the counties of Denver, Adams, Boulder, Larimer, Weld, Logan, Morgan, Washington and Sedgwick.

Map: 6

What: Platte Invasives Endeavor Plan for the South Platte Watershed, described as a way to sustainably control primarily Russian Olive and Tamarisk (salt cedar) species in the watershed. This community-driven effort recognizes that these non-native invasive plants cause economic and environmental harm, negatively affect public health and welfare, and require active long-term management programs with significant funding.

State funding is supplied by a 2008 \$1 million cost-sharing grant from the Colorado Water Conservation Board (CWCB). Federal funding is through an \$80 million authorization west-wide for similar activities.

The problem(s) include: many of these water systems and associated riparian lands have been severely degraded over the past 150 years by anthropogenic activities (damming, road building, irrigation, etc.) and invasive plant species, resulting in reduced water quality, modified river regimes and altered ecological systems and habitats. Tamarisk (*Tamarix spp.*) and Russian olive (*Elaeagnus Angustifolia*) are invasive species of particular interest due to their high profile status and negative environmental impacts. Tamarisk is a facultative phreatophyte with an extensive root system well suited to the hot, arid climates and alkaline soils common in the western U.S. These adaptations have allowed it to effectively exploit many of the degraded conditions in southwestern river systems today (e.g., interrupted flow regimes, reduced flooding, increased fire). They constrict the channel, consume water at high rates, and negatively affect native vegetation, fish & wildlife.

Extent of the problem has been estimated at 375 acres for tamarisk and 1900 acres for Russian olive.

Target species habitat improvements include: The amphibious species include the Northern Cricket Frog (SC), and Northern Leopard Frog (SC). The bird species include the Least Tern (FE, SE) Plains Sharp-Tailed Grouse (SE), Piping Plover (FT, ST), Bald Eagle (ST), Burrowing Owl (ST), Greater Sandhill Crane (SC), Ferruginous Hawk (SC), Mountain Plover (SC), and Long-Billed Curlew (SC). The fish species include the Plains Minnow (SE), Suckermouth Minnow (SE), Northern Redbelly Dace (SE), Southern Redbelly Dace (SE), Brassy Minnow (ST), Common Shiner (ST), Plains Orangethroat Darter (SC), and Iowa Darter (SC). The mammal species include the Preble's Meadow Jumping Mouse (FT, ST), River Otter (ST), Townsend's Big-Eared Bat (SC), Black-tailed Prairie Dog (SC), Northern Pocket Gopher (SC) and Swift Fox (SC). The reptiles include the Triploid Checkered Whiptail (SC), Yellow Mud Turtle (SC), and the Common Garter Snake (SC).

Who: Partnership between private landowners, conservation districts, Colorado counties and towns, state and federal agencies

Link(s): <http://www.co.weld.co.us/assets/BC8D23b8cA5B78adB73c.pdf>

Citation: <http://www.co.weld.co.us/assets/BC8D23b8cA5B78adB73c.pdf>

Graphics:

When: as of 2009

Where: Entire Cache la Poudre Watershed

Map: 29

What: State & Federally Threatened, Endangered & Candidate Species as well as Species of Special Concern, including: American Peregrine Falcon, Bald Eagle, Black-Tailed Prairie Dog, Brassy Minnow, Burrowing Owl, Common Garter Snake, Common Shiner, Greenback Cutthroat Trout, Iowa Darter, Northern Leopard Frog, Preble's Meadow Jumping Mouse, River Otter, Swift Fox, and Townsend's Big-Eared Bat.

Who: Colorado Department of Agriculture, State Conservation Board, United States Department of Agriculture, Natural Resources Conservation Service

Link(s):

<http://www.co.nrcs.usda.gov/technical/waterres/Cache%20la%20Poudre%20November%202009a.pdf>

Citation: Cache la Poudre Hydrologic Unit Code 10190007, Rapid Assessment

Graphics: Snap17.gif

When: 2010

Where: Portions of the North and South Fork and mainstem Cache la Poudre River, including portions of the tributaries of Bennett Creek, Pendergrass Creek, Poverty Gulch, Skin Gulch, Young Gulch, Hewlett Gulch, Elkhorn Creek, Stonewall Creek, Tenmile Creek, North, Middle, South Fork and mainstem Rabbit Creeks, North Lone Pine Creek, and Columbine Canyon, and buffers surrounding these streams.

Map: 28

What: Revised Critical Habitat Designation for the Preble's Meadow Jumping Mouse in Colorado, Final Action

Who: U.S. Fish and Wildlife Service

Link(s): <http://www.federalregister.gov/articles/2010/12/15/2010-30571/endangered-and-threatened-wildlife-and-plants-revised-critical-habitat-for-the-prebles-meadow>

Citation: Federal Register 75 FR 78430

Graphics: Prebles_North.gif and Prebles_Main.gif

When: 2010

Where: Poudre tributaries above the North Fork

Map: 22

What: Arapahoe snowfly petitioned as endangered with the US Fish & Wildlife Service

Who: Xerces Society for Invertebrate Conservation

Link(s): <http://www.xerces.org/wp-content/uploads/2010/04/capnia-arapahoe-petition1.pdf>

Citation:

Graphics: NA

When: 2010

Where: Virtually the whole basin

Map: 6

What: Portions of the mainstem Poudre and S. Platte Rivers, and their tributaries, appear on Colorado's 303(d) list of impaired waters. Impairments (in various places) include elevated levels of copper, lead, iron, mercury, cadmium, pH, E. coli, manganese and selenium. Elevated water temperature, low dissolved oxygen, excess ammonia or sediment, or impaired aquatic life use are other causes. Also see related mercury advisory for Horsetooth Reservoir.

Who: Colorado Department of Public Health and Environment

Link(s): <http://tinyurl.com/a9y5ne9>

Citation:

Graphics: HorsetoothMercuryAdvisory.jpg

When: 2010

Where: Poudre River from canyon to I-25

Map: 23

What: Documentation of riverine habitat losses and sedimentation issues due to river flashiness and unnatural flow regimes, largely attributable to irrigation operations

Who: Milhous and Bartholow (2010)

Link(s): <http://fossilcreeksoft.com/S7B-1.pdf>

Citation: Milhous, Robert T. and John M. Bartholow. 2010. Environmental Flow Issues in the Poudre River, Colorado, USA. In Proceedings, ISE 2010, 8th International Symposium on Ecohydraulics 2010. September 12-16, 2010 COEX, Seoul, Korea. Korea Water Resources Association (KWRA). pp 1469-1476. (CD- paper S7B-1)

Graphics: Snap16.gif

When: 2010

Where: South Platte

Map: 16

What: Industrial facilities dumped over 700,000 pounds of toxic chemicals into Colorado's waterways in 2010, more than a third of which went into the South Platte, according to a report released by Environment America. Using toxic chemical releases reported to the U.S. EPA's Toxics Release Inventory for 2010 (the most recent data available), the report documents that Cargill Inc. of Fort Morgan was the biggest polluter in Colorado, dumping over 235,000 of the nearly 250,000 pounds of toxic pollution discharged into Colorado's South Platte alone.

Who: Environment America Research and Policy Center

Link(s): <http://www.environmentcolorado.org/news/coe/over-720000-pounds-toxic-chemicals-dumped-colorado%E2%80%99s-rivers>

Citation: Environment America Research and Policy Center. 2012. Wasting Our Waterways 2012: Industrial Toxic Pollution and the Unfulfilled Promise of the Clean Water Act. 48 pages. On the Internet at

<http://www.environmentamerica.org/sites/environment/files/reports/Wasting%20Our%20Waterways%20vUS.pdf>

Graphics:

When: 2011

Where: Fort Collins Lincoln Street USGS Gage

Map: Slide26.gif

What: *E. coli* episodically exceeds EPA standard for contact water exposure of 126 Colony Forming Units (CFU) per 100 ml. Exceedences are presumably associated primarily with stormwater runoff events, but exact circumstances and source(s) remain uncertain.

Who: Monitored and reported by Fort Collins Utilities, 2011.

Link(s): NA

Citation: Spreadsheet "1999 2010 Ftc Poudre Ecoli at Lincoln Street Gage.xls"

Graphics: EColiGraph_Lincoln_05-11.gif

When: 2012

Where: Poudre River from western-most burn areas of the High Park and Hewlett Fires to at least the river's mouth.

Map: 30

What: Ash and debris from fire-impacted slopes washing into the tributaries and the mainstem due to flash floods, smothering sediments and fish gills, turning the water almost black, and altering the pH. Over 90,000 acres burned in total. Ash may dissipate after a few month (depending on flows and rain), but excess sedimentation and impacts to the fishery are likely to continue for many years.

Who: No official reports that we know of, but lots of press coverage.

Link(s): for example: http://www.denverpost.com/breakingnews/ci_21069966/black-sludge-left-poudre-river-after-high-park

Citation: NA

Graphics: NA

When: 2012

Where: Sand Creek confluence with South Platte River, near I-270 in Commerce City

Map: 17

What: Benzene spill by Suncor Energy

Who: The *Denver Post* reports that "three months after state regulators ordered an intensified cleanup, the fouling of northeastern Colorado's main waterway continues — illustrating the difficulty of dealing with one of the Rocky Mountain region's long-running cases of industrial pollution". Water sampling data shows that: (1) At the confluence of Sand Creek and the South Platte, the average benzene concentration was 460 parts per billion in February, 2012, up 29 percent from an average of 356 ppb in December. The federal drinking-water standard is 5 ppb; (2) Farther downstream, beneath a bike bridge on the South Platte, tests show an average benzene concentration in February of 241 ppb, up nearly 10 percent from 220 ppb in December; and (3) Benzene measured in the past weeks at a series of surface wells along Sand Creek also remained elevated: 170 ppb, 110 ppb, 93 ppb and 89 ppb. The article provides extensive measurement data.

Link(s): http://www.denverpost.com/news/ci_20075398

Citation: NA

Graphics: NA

<p>When: 2013</p> <p>Where: Lower Poudre Canyon area, roughly from Eggers to the canyon mouth</p> <p>Map: 22</p> <p>What: High Park and Hewlett Fires contribute high debris flows, making the highway impassable, clogging culverts and pipelines, almost damming the river, and spiking turbidity</p> <p>Who: Documented by USGS in cooperation with CDOT, among others</p> <p>Link(s): http://www.northfortynews.com/dangerous-mudslides-becoming-commonplace-in-poudre-canyon/ and http://pubs.usgs.gov/of/2012/1148/</p> <p>Citation: Verdin, K.L., Dupree, J.A., and Elliott, J.G., 2012, Probability and volume of potential postwildfire debris flows in the 2012 High Park Burn Area near Fort Collins, Colorado: U.S. Geological Survey Open-File Report 2012–1148, 9 p.</p> <p>Graphics: Snap19.jpg</p>
<p>When: 2014</p> <p>Where: Poudre River east of Weld County Road 23</p> <p>Map: 31</p> <p>What: Noble Energy storage tank damaged by high flows dumped approximately 7,500 gallons (178 barrels, or over 28 tons) of crude oil into the Poudre River.</p> <p>Who: Colorado Department of Natural Resources and Colorado Oil and Gas Conservation Commission</p> <p>Link(s): http://www.denverpost.com/news/ci_26004943/oil-spill-from-tank-dumps-7-500-gallons</p> <p>Citation: http://www.wtvq.com/news/national/story/Over-7-000-gallons-of-crude-oil-spills-into-Colora/JnlsAEJ7gUCGTInP8_qHyg.csp</p> <p>Graphics: NA</p>

Temporal and spatial resolutions are only approximate.

Unfortunately, this list is not comprehensive. Please help us add to this list by emailing MapMan@SaveThePoudre.Org with enough information (links, etc.) to add entries and determine the approximate locations. Thanks!