Mr. Chandler J. Peter
U.S. Army Corps of Engineers
Denver Regulatory Office
9307 South Wadsworth Blvd.
Littleton, CO 80128-6901

Dear Mr. Peter, 9/12/2008

I'm writing as chair of the Save The Poudre Coalition to offer comments on the Draft Environmental Impact Statement (DEIS) for the Northern Integrated Supply Project (NISP). I respectfully request that you add our comments as provided in this document into the legal record for this action.

The Save the Poudre Coalition is a partnership of twelve local, regional, statewide, and national organizations. Our partners are:

American Rivers
Cache la Poudre River Foundation
Citizen Planners
Clean Water Action
Colorado Environmental Coalition
Defenders of Wildlife
Earthjustice
Environment Colorado
Fort Collins Audubon Society
Friends of the Poudre
Poudre Paddlers
Sierra Club Rocky Mountain Chapter
Western Resource Advocates
Wolverine Farm Publishing/Matter Bookstore

We consulted with over 46 qualified professionals in the preparation of this letter and the attached documents. Fifteen have Ph.D.'s, fourteen have advanced degrees or certificates in their field, the remainder are degreed professionals with credentials and decades of experience in their respective fields, including this partial list:

- McCrystie Adams, J.D., Project Attorney, Earthjustice Legal Defense
- John Bartholow, M.S., Hydrologist retired from the USGS
- Brian Bledsoe, P.E, Ph.D., Dept of Civil and Environmental Engineering, Colorado State University
- Philip Cafaro, Ph.D., Associate Professor, Department of Philosophy, Colorado State University
- Kurt Fausch, Ph.D., Dept of Fish and Wildlife Biology, Colorado State University
- Jim Henriksen, M.S., Hydrologist
- Taryn Hutchins-Cabibi, M.A., Western Resource Advocates
- David Jones, M.S. Forest Ecology

- Nick Komar, Ph.D., Center for Disease Control
- Jason La Belle, Ph.D. Assistant Professor and Director of the Laboratory of Public Archeology, Department of Anthropology, Colorado State University
- Dan Luecke, Ph.D., Hydrologist in private practice
- Bart Miller, J.D., Director, Western Waters Program, Western Resource Advocates
- Drew Peternell, J.D., Colorado Director, Western Water Project, Trout Unlimited
- Robert T. Milhous, Ph.D. Hydrologist retired from the USGS
- William Miller, B.S., Retired Engineer and Ornithologist
- Doug Pflugh, M.S., Research Analyst, Earthjustice Legal Defense
- N. Leroy Poff, Ph.D., Professor of Biology, Colorado State University
- James Rose, Ph.D., Professor Emeritus, Department of Zoology and Physiology, University of Wyoming
- John Sanderson, Ph.D. Ecologist with the Nature Conservancy
- Stacy Tellinghuisen, Western Resource Advocates
- Gary Wockner, Ph.D., Natural Resource Ecology Laboratory, Colorado State University

We endorse the comments submitted by Western Resource Advocates, Trout Unlimited, Dr. Jason La Belle, Dr. James Rose, Dr. N. Leroy Poff, John Bartolow and the City of Fort Collins.

We are attaching a number of documents to this letter and request that you add them to the legal record for this action as well.

After reviewing the document and its accompanying technical reports in detail, we do not believe this DEIS meets the basic requirements of the Federal National Environmental Policy Act or the Federal Clean Water Act. These major deficiencies call for a rewrite of the DEIS that includes a new full Alternatives Analysis that must include:

1. Full analysis of the role water conservation and efficiency improvements play in demand side reduction.
2. An accurate analysis of existing populations and projected future growth that is based on science, land use planning, sound water policy, and the cumulative effects of regional development.
3. Careful examination of agricultural water transfers as a supply source, reviewed in the context of an accurate analysis of the environmental impacts of said transfers.
4. Rotating fallow agreements under current existing, realistic and manageable contract arrangements.
5. Realistic and accurate cost impact scenarios.
6. Cost/benefit analysis and comparison of the alternatives.
7. Full analysis of the potential water yield in the Cache la Poudre River watershed, which includes not just the recent climate record, but the full historic stream gage record and reconstructed historic climate records that take into account the full range of drought and wet year cycles.

The National Environmental Policy Act

The National Environmental Policy Act[1] requires federal agencies to prepare a detailed statement on the environmental impacts of a proposed "major federal action" and all of the reasonable alternatives thereto before authorizing any such action.[2] An agency proposal for major federal action exists for NEPA purposes "at that the stage . . . when an agency subject to [NEPA] has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated."[3] NEPA's purpose is to promote efforts "which will prevent or eliminate damage to the environment",[4] to inform the public of environmental consequences,[5] and to "help public officials . . . take actions that protect, restore, and enhance the environment."[6]

Under NEPA, the NISP Draft EIS must analyze "connected", "cumulative", and "similar" actions and three types of impacts.[7] Connected actions are those which are "closely related," including those that "[c]annot or will not proceed unless other actions are taken", or those that "[a]re interdependent parts of a larger action and depend on the larger action for their justification."[8] Cumulative actions are those that "have cumulatively significant impacts and should therefore be discussed in the same impact statement."[9] Similar actions include those that have "common timing or geography."[10] In order to assess "significance," NEPA requires consideration of "[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts."[11]

The three types of impacts to be studied in an EIS are those that are "direct," "indirect," and "cumulative."[12] Direct effects are those that "are caused by the action and occur at the same time and place."[13] Indirect effects are those "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable."[14] A project's "cumulative impact," is

> the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions . . . . Cumulative impacts can result from individually minor but

[1] 42 U.S.C. §§ 4321-4370f.
[2] *Id.* at § 4332(2)(C).
[3] 40 C.F.R. § 1508.23.
[4] 42 U.S.C. § 4321.
[5] 40 C.F.R. § 1500.1(b).
[6] *Id.* at § 1500.1(c).
[7] *Id.* at §§ 1508.25, 1508.7, 1508.8.
[8] *Id.* at § 1508.25(a)(1).
[9] *Id.* at § 1508.25(a)(2).
[10] *Id.* at § 1508.25(a)(3).
[11] *Id.* at § 1508.27(b)(7).
[12] *Id.* at 1508.25(c); *see also id.* at §§ 1508.7, 1508.8.
[13] *Id.* at § 1508.8(a).
[14] *Id.* at § 1508.8(b).

> collectively significant actions taking place over a period of time.[15]

NEPA's many policies and goals include:

- Encouraging a "productive and enjoyable harmony between man and his environment";[16]
- Promoting "efforts which will prevent or eliminate damage to the environment and biosphere";[17]
- Using "all practicable means and measures . . .to create and maintain conditions under which man and nature can exist in productive harmony";[18]
- Fulfilling "the responsibilities of each generation as trustee of the environment for succeeding generations";[19]
- Assuring "all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings";[20]
- Allowing beneficial use of the environment "without degradation . . . or other undesirable and unintended consequences";[21]
- Preserving "important historic, cultural, and natural aspects of our national heritage";[22]
- Achieving a "balance between population and resource use";[23] and
- Enhancing "the quality of renewable resources" and maximizing recycling of depletable resources.[24]

Mitigating Environmental Impacts

At the most fundamental level, NEPA is intended to help public officials make decisions that are based on an understanding of environmental consequences, and to take actions that protect, restore, and enhance the environment.[25] Federal agencies are required, to the fullest extent possible, use all practicable means consistent with the requirements of NEPA to "restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment."[26] CEQ regulations further define mitigation as:

---

[15] *Id.* at § 1508.7. *See also* Neighbors of Cuddy Mountain v. U.S. Forest Serv., 137 F.3d 1372, 1379 (9th Cir. 1998) (stating that with respect to a cumulative impacts analysis, an agency must provide "some quantified or detailed information" because "[w]ithout such information, neither courts nor the public . . . can be assured that the [agency] provided the hard look that it is required to provide.").
[16] 42 U.S.C. § 4321.
[17] *Id.*
[18] *Id.*
[19] *Id.* at § 4331(b)(1).
[20] *Id.* at § 4331(b)(2).
[21] *Id.* at § 4331(b)(3).
[22] *Id.* at § 4331(b)(4).
[23] *Id.* at § 4331(b)(5).
[24] *Id.* at § 4331(b)(6).
[25] *See* 40 CFR § 1500.1(b).
[26] *Id.* at 1500.2(f).

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.[27]

Effective mitigation therefore starts at the beginning of the NEPA process, not at the end, and must be included as an integral part of the alternatives development and analysis process.

We address these and other issues in the remainder of this letter.

Climate change and NISP projected firm yield

The NISP DEIS projects a firm yield of 40,000 acre-feet (AF) based on the climate record from 1951 to about year 2000. Though this period incorporated moderate drought and major wet periods, it did not capture the most significant droughts recorded for the watershed. A much longer climate and river flow record is available.

We examined the availability of the Grey Mountain right over the entire climate record, using measured data from the historic record (early 1900's through 2007) and reconstructed precipitation records from the tree-ring analysis and found that the NISP project,[28] when examined over this entire period, is unlikely to meet it's firm yield projections.

Using flow data from the 1951-1998 record, we built a linear model that incorporated the current year's total native flow with the previous four years' total native flows, in the following form:

$$y = \beta_0 \cdot f(t) + \beta_1 \cdot f(t-1) + \beta_2 \cdot f(t-2) + \beta_3 \cdot f(t-3) + \beta_4 \cdot f(t-4)$$

where
y is the volume of the Grey Mountain right for the current year, in acre-feet
f(t) is the total volume of native flow in the current year, in acre-feet
f(t-1), etc. is the total volume of native flow in the previous year, in acre feet, and so on.
β_0, β_1, β_2, β_3 and β_4 are regression parameters

[27] 40 C.F.R. § 1508.20.
[28] Connie A. Woodhouse and Jeffrey J. Lukas. 2006. Multi-Century Tree-Ring Reconstructions of Colorado Streamflow for Water Resource Planning. Climatic Change 78(2-4), 293-315. http://www.springerlink.com/content/c925656512300527/, viewed on 5/12/2008.

The basis for this model is the year-to-year availability of a junior right on the Poudre River like the Grey Mountain right. Junior rights are typically available based on current year's reservoir volumes as well as the current year's flows, and the current year's reservoir volumes are based on flows from previous years. Using this model, we were able to reconstruct the Grey Mountain right over the reconstructed and historic precipitation record, going back to 1618. All terms in the regression were statistically significant, and the model R^2 was 0.89. Total yearly system losses from the Glade Reservoir were conservatively estimated at 2,300 AF/year, though they could be much higher.

Our analysis indicates the following:

1. The NISP project firm yield is likely to be only 35,000 to 36,000 AF per year on average (12.5 - 15% lower than the projected 40,000 AF).
2. It would fail to deliver its projected yield one year out of every five.
3. Over the historic climate record from 1618 to 2007, there were five deep, extended droughts lasting two to three decades long during which the project would fail to deliver its projected yield in four out of five years.

The NISP DEIS requests operational flexibility allowing the Glade reservoir's managers to fill the reservoir with rented water in dry years. During extended droughts like those present in the historic and reconstructed climate record, it does not appear that sufficient rental water would be available to meet the needs of the project participants.

For these reasons, we do not believe that the NISP project will meet its projected firm yield projections. The firm yield and the project operations plan must be re-evaluated in the context of the entire climate record, incorporating major as well as minor droughts. Additionally, the operations plan and firm yield projections analysis must evaluate the project's operation using currently available climate change scenarios in order to assess the effects of future climate variability and shifts in precipitation patterns on the project's ability to meet its firm yield projections.

There are many other simple linear or nonlinear models that could be used in order to predict the Grey Mountain right and other aspects of the river's hydrology based on historic data and therefore provide insight into the effects of drought and whether the project could fulfill its projected purpose and need.[29,30] A useful analysis should not be limited to the example provided above.

NISP impacts on Agricultural Wetlands

On page ES-7 of the NISP DEIS we find the following statement:

> "The removal of irrigation from up to 69,200 acres of agricultural lands would result in a loss of about 1,384 acres of wetlands, which is substantially greater than any of the other alternatives."

[29] A.C. Davidson. 2003. Statistical Models. Cambridge University Press.
[30] G.A.F Seber and C.J. Wild. 1989. Nonlinear Regression. New York: John Wiley and Sons.

This estimate appears in nineteen other locations in the document. It is based on a transparently faulty analysis of the quantity of irrigation-associated wetlands in the region. The analysis was based on a visual estimate of just two farm fields, from which the authors of the analysis surmised that 2% of all land in the entire region served by Poudre River irrigation water consisted of wetlands providing wildlife habitat.

We consulted with seven independent Ph.D.- and M.S.-level experts in land use analysis, wetlands ecology, and vegetation surveys in Colorado. We surveyed them on the method and the findings of this analysis. The overwhelming consensus was that the survey method and analysis was completely inadequate. It would be very unlikely to pass peer review in any scientific or technical journal dealing with wetlands analysis, vegetation classification, or a related field. The findings are inconsistent with the Fish and Wildlife Service (FWS) wetlands inventory data for the region.[31] It grossly overstates the habitat values of irrigation-associated wetlands. It grossly overestimates irrigation-associated wetlands acreages by a factor of five to ten times.

As a proof of concept, in early August we drove a transect across agricultural lands irrigated with Poudre River water, in the region around Ault, Eaton, and Greeley, surveying from county roads South and West of those towns across the Poudre River. In our brief survey of twenty farm fields receiving irrigation water we estimated that areas with developed wetland vegetation constituted less than 0.2% (one-fifth of one percent) of the area. This is one-tenth of the area percentage used as the basis for the environmental analysis of the no-action alternative.

In short, the survey used as the basis for the environmental analysis in the NISP DEIS must be thrown out and be completely redone from scratch using accepted, rational, and accurate survey techniques that adequately rank and report the habitat quality of the wetlands. The survey must take into account the following factors:

1. Analyze vegetation composition and structure on any wetlands found in the survey to assess habitat quality.
2. Consider underlying soils and the timing of water applications to assess drainage and the longevity of surface water presence.
3. Randomly select survey sites from throughout the geographic region based on factors that influence the depth and size of irrigation-associated wetlands.
4. Consider the effects of slope and aspect on the formation and seasonal longevity irrigation-associated wetlands.
5. Consider the effects of irrigation methods (e.g. flood, furrow, pivot, other sprinkler types, drip, etc.) on the formation and seasonal longevity of irrigation-associated wetlands.
6. Consider the effects of the source of irrigation water (gravity fed, pumped from a well, pumped from a ditch).
7. Parcel size

[31] U.S. Fish and Wildife Service. National Wetlands Inventory. http://www.fws.gov/nwi/, viewed on 9/8/2008.

8. Survey replication among the above sources of variation.

Taking these various factors into account will likely mean the wetlands survey will have to examine at least forty-five (45) randomly-selected fields from the affected area in order to take into account the many sources of potential variation in the survey and include at least two sets of replicates.

Screening threshold of 30% used in the NISP DEIS Alternatives Analysis

Section 2.1.2.1 on page 2-5 of the NISP DEIS states the following regarding threshold cutoff values for the DEIS Alternatives Analysis:

> "**Firm Yield.** The firm yield screening criterion requires that viable water supply sources must be capable of providing a firm annual water yield. This screening criterion was only applied to concepts because concepts are defined as a source of potential water supplies able to meet a portion of the NISP Participants' request. To pass this criterion, concepts must be able to provide at least 30 percent of the total requested firm annual yield of 40,000 AF, which is 12,000 AF. Limiting the provisional percentages reduces the number of water supply sources to a maximum of four, which is logistically reasonable for a regional water supply project of this magnitude."

The DEIS and supporting documents claim to have cast a wide net, examining a variety of alternatives to meet the stated purpose and need of the NISP participants. It is unfortunate, however, that the Corps of Engineers consultants who considered the array of potential alternatives used the same method as the project proponents (the Northern Colorado Water Conservancy District), who had made their own examination of alternatives in prior documents. At the very least, this does not appear to fit the role of the Corps as independent arbiters of the proposed project.

The document provides no basis or justification for this cutoff value, or for limiting the sources of supply to a maximum of four. There are no surveys of other projects, or scenarios upon which they base the justification. In short, the DEIS offers no basis or justification for any screening threshold – it merely sets a screening threshold and applies it.

The 30% screening threshold cuts off one of the largest alternative sources of water (rotating fallow agreements). Rotating fallow agreements are in our view the most viable of the alternative water sources available. They present the greatest opportunity to partner with agricultural water users while meeting the needs of the NISP participants. Had the alternatives analysis used a smaller threshold value (even just one percent smaller) and evaluated rotating fallow agreements with the same contractual arrangements as is being used in other places in Colorado and the West, rather than the cumbersome, burdensome, and unlikely contractual arrangement proposed in the DEIS, they would have passed scrutiny and been incorporated into NISP at a much reduced cost compared with the construction of NISP. And, they would have likely made the existing NISP scenario unworkable.

The Northern District's initial analysis, and the subsequent COE analysis, applied an arbitrary screening threshold mandating that any alternative chosen must supply at least 30% of the stated water demand. Such an arbitrary threshold guaranteed that the applicant's "preferred" alternative would be a large, "regional" project under the presumption that overall costs would be lower and the affected environment would be better protected -- a project so large, in fact, that it must be constructed and operated by an organization such as the Northern District. However, such an arbitrary 30% threshold also guaranteed that a combination of small, flexible, less expensive, and incremental water supply projects would never be seriously considered. Being blind to small scale, appropriate development is a recipe for unsustainable water projects and, as our analysis shows, failed to identify a suitable alternative that would preserve what is left of the Cache la Poudre River.

In summary, we conclude that the NISP Alternatives Analysis must be redone with the screening threshold and limitation to just four water sources removed to allow for greater flexibility, a wider range of options, a less costly project, and less environmental impact.

Timeliness screen applied in the Alternatives Analysis

Page 2-5 of the DEIS describes a Timeline Screen applied in the alternatives analysis, eliminating any option that could not be completed within five years, 2005-2010. Obviously at this point no water would be provided from this project before 2010. If this screen was truly need driven in that the water must have been supplied before 2010, then the action alternatives no longer pass the timeliness screen. At this point the Corps must drop this timeliness screen and consider all available options for supply.

Purchasers ability to purchase and sell units in the project

Page 2-31, section 2.4.1.2 of the DEIS states the following:

> The NISP Participants would have the ability to sell their contract rights in NISP to other entities within the District boundaries or buy additional contract rights in NISP as they become available. The ability to purchase and sell contracts in NISP would not alter the size or operation of NISP. Once NISP becomes operational, it is anticipated that there would be a market for NISP contracts similar to the market that currently exists for C-BT units.

We see two major issues associated this clause. First, it casts significant doubt as to whether the project is necessary. If the participants' need projections are solid and the need is as firm, then why would they want to sell shares in the project? This casts serious doubt as to their actual need for the water. For that matter, it restricts the purchase and sale of project water to the boundaries of the Northern Colorado Water Conservancy District, which violates the free market. We are no fans of trans-basin water diversions, however developing a major publicly-funded project like NISP and then restricting the purchase and sale of the resources for the project to the boundaries of the NCWCD bureaucracy casts serious doubt as to the actual need for the project and whether it supports legal provisions that allow for the purchase and sale of water within Colorado.

Using other sources of water to fill the Glade Reservoir

On page 2-31, section 2.4.1.3, the proponents request the right to initially fill the reservoir with other sources of water. This would lead to the temporary dry up of tens of

thousands of acres irrigated agricultural lands, which were not accounted for in the impacts analysis.

If other water is available, then where is the actual need?

References to the EPA 303d list must be updated

Page 3-25, section 3.5.1 references the 303d list for 2006. The 2008 list was approved by EPA in May of 2008. It adds pH and Cu for the Monroe Canal to Shields Street reach (COSPCP10) below the North Fork and an aquatic life use impairment for Horsetooth Reservoir (COSPCP14).

TCE Plume modeling

Page 4-38, section 4.7.2 discusses the impacts of the Glade Reservoir on the TCE plume. The modeling work on the pollution plume predicted its future course based on current conditions. No modeling was apparently done to consider the role that reservoir leakage would have on the TCE plume direction or rate of travel via alteration of the subsurface hydrologic gradient. This is a very serious problem considering the great public health risk posed by the TCE plume. The impact of the proposed reservoir on the TCE plume direction and rate of travel must be modeled directly.

Biological Assessment used – is it the final or the draft?

The Biological Assessment is labeled in the footer throughout as "Predecisional Draft." There is no clear indication that the Corps used the final version of the Biological Assessment in its analysis.

Wetlands Screen Threshold

On pages 2-5 and 2-6, section 2.1.2.2, the DEIS describes a rationale for the 60 acre wetlands screen threshold. This threshold is based on a level "where the wetland area differential diminishes as screening tool," i.e., where the screen eliminates a certain number of projects, rather than be based on an acceptable level of wetland loss as determined through sound science. This screen is entirely arbitrary – there is no scientific justification provided related to the relationship between wetland size and biological function, water quality improvement, habitat value, recreational contributions, or direct relationship to the project. It must be removed entirely as a screen.

Outdated Topographic Maps

At 2-6, the waterways screen was based on stream classifications taken from USGS topo maps rather than on-the-ground inspections. This review was presumably conducted with USGS 7.5-minute series maps which are generally less than current. For example, the 7.5-minute map Laporte, which covers the Glade Reservoir site and the river as far east as Laporte, was most recently published in 1979 as a non-field checked photorevision of a 1962 map. The photos used for the revision were taken in 1975, and the revisions in the vicinity of the project appear to be limited to cultural features and mining operations. The original mapping, which appears to be the source of the hydrological data, was based on 1958 photos field checked in 1962. All of which is to say that the stream classifications used for this screen threshold were based on 45-year old data.

Similar data issues apply to all environmental analyses which were conducted from USGS topographic maps without additional field-checking; we call all of these inappropriate uses of the old data into question.

Hazardous Land Uses and Contaminants

On pages 2-6 through 2-7, there is discussion of eliminating from consideration all sites with "hazardous land uses...and various contaminants..." How then is the proposed site for the Glade Reservoir with its underlying TCE plume not excluded?

C-BT Transfers Eliminated from the Alternatives Analysis

On page 2-10, 2.1.3.1, the alternatives analysis eliminates C-BT transfers because one could only get 37,000 AF using a 0.5 AF per unit quota, the minimum quota ever allotted through C-BT. In the Healthy Rivers Alternative we discuss the reasons why the historic average of 0.7 AF per unit should be applied. If a factor of 0.7 AF per unit was applied, the amount of water available would go well above 40,000 AF.

Air Quality Issues

On page 3-127, section 3-25, the DEIS admits that the reservoirs sites are within a Federally-designated ozone non-attainment area but claim that "air quality is currently not an issue in these areas." This is entirely wrong. The State of Colorado is putting great efforts into developing and implementing ozone reduction actions to comply with Federal Standards. According to the State:[32]

> Colorado is in the midst of an effort to reduce ozone air pollution. High levels of ozone present health concerns both for healthy adults and for sensitive people, particularly the elderly, young children and those with asthma or other respiratory ailments. Symptoms include stinging eyes and throats, chest pains, coughing and breathing difficulty.
>
> Denver and North Front Range Area Violates Ozone Standard
>
> The Denver-metropolitan and North Front Range areas became "nonattainment" areas for the federal ozone standard on November 20, 2007, when a deferral by the U.S. Environmental Protection Agency expired.
>
> The nonattainment designation is a result of a violation of the federal 8-hour ozone standard. The standard is based on a three-year average of monitoring data. Air quality monitoring data for the 2005-2007 averaging period confirms a violation of the eight-hour health-based standard.
>
> A detailed plan to reduce ozone is being developed by the Colorado Air Pollution Control Division, along with the Regional Air Quality Council and the North Front Range Metropolitan Planning Organization. The

[32] http://www.cdphe.state.co.us/ap/ozone.html, viewed on 9/11/2008.

> resulting attainment plan will be submitted by the Regional Air Quality Council to the Colorado Air Quality Control Commission for approval by the end of 2008, with legislative review expected after that. Once all state approval processes have been completed, the plan ultimately will be submitted by the governor to the EPA.
>
> The plan will require further reductions in ozone levels beyond what was required through an earlier Ozone Early Action Compact. The Ozone Early Action Compact allowed EPA to defer classifying the Denver metropolitan area under the 8-hour ozone standard. That deferral expired on November 20, 2007.

This one paragraph dismissal of serious health concerns and absolutely no discussion of how the project might impact these ozone levels is a clear failure to meet both the letter and intent of NEPA. Potential impacts to ozone from the project include, but are not limited to: vehicle emissions from construction, emissions changes from the highway re-alignment, and changes to release of ozone precursors from changes in land use practices.

Recreation potential at the proposed Glade Reservoir

The NISP DEIS proposes that the Glade Reservoir will provide over $17 million in yearly economic benefits to Northern Colorado. This dramatic overstatement of the likely benefits of the project is based on a transparently faulty analysis. It ignores key factors that, if considered in the analysis, would greatly change the outcome:

1. The analysis largely ignores or grossly understates the impacts the project would have on downstream economic benefits, not just in Fort Collins but in Bellevue, Laporte, Timnath, Windsor, Greeley, and rural Larimer and Weld Counties.
2. The analysis assumes that use levels will immediately reach levels experienced at Horsetooth Reservoir and will remain constant every year.
3. It does not factor in the likelihood that the reservoir may take years to fill, possibly a decade or more.
4. It does not factor in fluctuating water levels as a factor that influences visitation. Our own analysis of Glade reservoir water use levels using the historic and reconstructed climate record indicates that about a third of the time the reservoir will be nearly empty, fluctuating between dead pool and very low water levels.
5. It assumes that fish concentrations and angling potential will remain constant over this time, ignoring the role that water quality, turbidity, fluctuating oxygen concentrations, and siltation have on sport fish biology and reproduction. Our own analysis indicates that, should Glade be built, fishing will be poor at least one third of the time, and water sports will not be viable due to safety concerns due to turbid water, underwater obstacles, and shallow water.

An accurate and viable economic benefit analysis would take into account the above factors and the following:

1. Survey the boating public and assess use levels based on the fraction of the public who utilize motorized recreation and who would travel to Glade for recreation, if the reservoir were built.
2. Take into account the impact of rising fuel prices on motorized recreation and visitor use at the reservoir if it were built.
3. Accurately assess how highly fluctuating reservoir levels and frequent dead pool conditions would influence visitation, using data from other reservoirs with similar conditions.

Geographic Scope of the Impacts Analysis

Since this project would severely restrict river flows on the entire lower Poudre River below the canyon mouth, and would significantly impact flows on the South Platte River, the entire stretch of the Cache la Poudre River to the confluence with the South Platte, and then the South Platte from the Poudre River downstream must be considered in the impacts analyses done for the DEIS.

Proposed Flow Mitigation in the Filter Plant Run

One of the mitigation options proposed in the DEIS is to increase flows by about 40 cfs during the month of August through the "Filter Plant Run" on the Poudre River, and make structural changes that would allow linking the "Filter Plant Run" and the "Bridges Run". The DEIS estimated that increasing flows through August would extend the rafting season through the month of August with whitewater sports use levels at the same levels as in May, June, and July. This highly speculative argument led to doubtful claims that it would increase the economic value to the rafting companies by about $186,000.

We surveyed whitewater sports companies operating on the river to investigate the economic value of this claim. The survey is being sent to the Corps of Engineers by Josh Metten under separate cover. We found the following:

1) The increase of ~40 cfs is very unlikely to extend the rafting season to any degree, except in the wettest of years, perhaps once per decade.

2) The major limiting factors for the rafting season in August are very low river flows and the start of the school year.[33, 34] The great majority of responses we received indicated that ~40 cfs would do very little to nothing to extend the rafting season on the filter plant run. The customer base during the week is largely gone as students go back to school and vacationing families return home. The flows are so low that exposed rocks and gravel bars make rafting and kayaking impractical.

Most companies end their season by the first of second season in August for the reasons cited in (2) above. Most do not use the filter plant run after the month of June. Therefore we do not believe that the estimate of an $186,000 economic gain is credible. It is grossly overstated, speculative, and must be revised downward. Based on the survey results, we believe it is overstated by a factor of at least ten.

[33] USGS stream gage data. http://waterdata.usgs.gov/co/nwis/rt, viewed on 9/11/2008.
[34] Poudre River Rock Report. http://www.poudrerockreport.com/, viewed on 9/11/2008.

Adaptive Management

In section 4.4.3 and in later sections, the NISP EIS proposes to use Adaptive Management as its primary means of mitigation for the project. The DEIS devotes relatively few pages in total to the entire concept, but places a great deal of its impact mitigation strategy on the concept.

The concept of Adaptive Management was first proposed as a means to assess the environmental impacts of construction projects when important environmental impacts are unknown or difficult to assess.[35, 36] For the NISP project, the likely impacts are well understood and straightforward to assess, due to the decades of environmental research.

We have a number of grave concerns about applying adaptive management to NISP, as follows:

1. Though the DEIS proposes a number of possible survey mechanisms and assessment techniques, it offers no basis or justification for utilizing adaptive management to deal with the expected impacts of the NISP project when the likely impacts are well understood and straightforward to model and assess. Using adaptive management must be justified using at least the following criteria:
    a. The similarities between the proposed NISP project and other projects employing adaptive management.
    b. Specific reasons why adaptive management should be chosen, when the expected impacts of the project are straightforward to predict and well understood.
    c. The merits of adaptive management must be presented, alongside the disadvantages.
    d. The desired outcomes of adaptive management, and why they could not be achieved with a formal mitigation plan.
2. No adaptive management plan was developed for the project, from which the merits of the adaptive management proposal could be assessed. The DEIS simply proposes that a plan be submitted to the Corps of Engineers at least 2.5 years prior to initiating diversions, with provisions for reviewing the plan every five years afterward. How can the decision makers and the affected public assess the adequacy of adaptive management in mitigating the impact of the project if no plan is presented until after the project is permitted and construction begins? We believe an adaptive management plan must be prepared as part of the DEIS for this project so that decision makers and the affected public may judge the merits of this proposal.
3. We could find no proposed budget for developing, implementing, and modifying adaptive management plans and techniques. There does not appear to be a budget in the project for mitigation measures after diversions begin.
4. No mechanisms are proposed for analyzing the results of data collection and making decisions regarding proposed mitigation measures other than submitting plans to the

[35] Holling, C.S., ed. 1978. Adaptive environmental assessment and management. New York: John Wiley and Sons, Inc. 377 p.
[36] Walters, C.J. 1986. Adaptive management of renewable resources. New York: McGraw Hill. 374 p.

Corps of Engineers and re-evaluating those plans every five years. There are no stakeholder groups or expert panels proposed. No decision-makers are identified as to who decides what mitigation measures would be necessary and how those decisions would be made.

5. Standards and goals for mitigation measures are not proposed in the DEIS. In order to judge the efficacy of the proposal and the seriousness of the project proponents, we must know what the very specific mitigation goals are that they seek to achieve, involving water quality, sustaining riparian forests, sustaining wetlands, the aquatic environment, and economic impacts.

Adaptive Management is wholly unsuited for this project, and we believe the concept must be dismissed.

Impacts on Riparian Vegetation

The final conclusion that ERO reached in its evaluation of the four alternative plans (associated with NISP) for the Cache La Poudre R was that "the reductions in streamflows on the Cache La Poudre (CLP) and South Plattte River associated with the action alternatives are not anticipated to cause a change in riparian and/or wetland vegetation." This conclusion is not supported by data or an objective framework for assessing possible changes in vegetation in response to the alternatives. This conclusion is based upon expected change in monthly average flows from "baseline condition". "Baseline condition" is mentioned for the first time in the conclusions on p. 56 of the report and is never defined. This is important because if "baseline condition" during a dry year is based upon an average low flow, plants are likely to be more sensitive to smaller changes than deviation from higher baseline condition. In other words, a reduction in stage by 0.5 feet at low flow should have a greater effect than the same reduction in flow at a higher flow.

Overall, the technical report is weak, does not use data relating flow to riparian vegetation to reach its conclusions, and fails to directly address the potential and likely effects of reductions in high flows on riparian vegetation. Changes in high flow are the basis of the proposed alternatives and high flows are a key component of the range of flows that riparian vegetation is responsive to and dependent upon. Although the main hydrologic impacts of the NISP proposal are to reduce the magnitude and frequency of high flows, the ecological effects of these reductions are de-emphasized and/or ignored in the conclusions. The report was difficult to technically evaluate because there is very little substantive content to the report, no data, no linkages of hydrology to vegetation, and unsubstantiated conclusions.

Several important points and considerations concerning the conclusions of this report follow:

1. The ERO report does not present any data relating riparian vegetation to streamflow. The conclusions of the report are strongly stated but not backed by evidence or findings from ERO or other studies (which are based upon a singe species at a single study site – Scott et al. studies).

2. All of the conclusions were made based upon "reviews of aerial photography and site visits" and some assumptions linking a few studies to the reaches of interest.
3. Site selection was based upon ERO's consideration of the "areas where the greatest changes in streamflow and potential for effects to riparian vegetation might occur". These "sensitive reaches" were restricted to natural areas, yet there are potential negative effects of altered flow regime along the entire river course. Although the channel through the city is heavily impacted and in a degraded state, streamflow still performs important ecological functions through the entire reach.
4. "assessment of potential effects to riparian and wetland vegetation … was based primarily on average monthly flows and stream stage associated with each alternative" (p. 35). Riparian vegetation responds to extreme flows (highs and lows) that are not well-represented by monthly averages, particularly in hydrologically variable months like April, May, and June.
5. Stage-discharge relationships vary along the course of the CLP. ERO's conclusions are based upon how stage will be affected at the gage locations with are likely more and less at different points along the river depending on cross sectional dimensions (channel geometry).
6. The role of peak flows in maintaining recruitment patterns, age-class structure, and sustainable riparian communities is mentioned in the report but when the proposed reductions in peak flows are evaluated a series of circular illogical steps are taken to diminish the importance of these reductions. For example, p. 56 "The NISP action alternatives would reduce the frequency of flows of 3,400 cfs from 17 to 5 days and flows of 1,600 cfs from 19 to 9 days for the 50 years of hydrologic record (Anderson 2008). Neither of these flows currently occurs at a frequency sufficient to provide hydrologic support for riparian vegetation. It is likely that most of the supportive hydrology comes from the lower more frequently occurring streamflows and supplemental sources such as the ditch and nearby ponds." Riparian plant species respond to a range of flows over a range of timescales. Large infrequent high flows are key to the maintenance of these systems as they are the flows that connect the river to the floodplain, create sites for regeneration of a range of riparian plant species, stimulate microbial activity and decomposition of organic material on the floodplain, nutrient release, flushing of floodplain soils, recharge of alluvial aquifers, and a range of other important ecological functions (I can provide citations). The absence of such flows will most certainly cause changes in the physical integrity of the floodplain and shifts in riparian plant population structure and community composition over time. Who is to say that because the effects may be expressed over a long period of time that they are not worth considering in evaluating the costs and benefits of NISP? Short and long term effects should be evaluated.
7. "Riparian vegetation on stream reaches with ground water elevations that are independent of streamflows are unlikely to be affected by changes in streamflow (p. 38)." Fails to recognize the importance of high flows in maintaining riparian vegetation. Typically reaches are gaining and losing at different times during the season. This statement is unsubstantiated.
8. "Although supportive hydrologic conditions are essential for the maintenance of wetlands, simple cause-and-effect relationships are difficult to establish (Mitsch and Gosselink 1993)" (p. 40). Difficulty in establishing such linkages does not justify

ignoring them. There seems to be confusion about the fact that riparian areas may contain jurisdictional wetlands, riparian areas also include a mosaic of other fluvially influenced areas that may not be "wetland" in the strict legal sense, but are uniquely riparian.

9. "Scouring and overbank flows can reduce vegetation encroachment and possibly help regenerate some types of riparian vegetation by scouring the floodplain and creating soil conditions favorable for regeneration (Stromberg et al. 1993)." (p. 42). This is a statement with widespread scientific support. Loss of such flows or reduction in the frequency of them would occur under alternatives 2, 3, and 4 of NISP. Why then are these facts not linked together in an evaluation of the possible effects of NISP. This seems to contradict the ERO conclusions for most of the reaches evaluated.
10. "Many of the riparian areas along the Cache la Poudre and South Platte rivers appear to be supported by water sources other than the rivers (e.g., ditches, return flows, and ponds)." (p. 46). This may be true, but does not diminish the fact that NISP is not likely to affect the low flows that these other water sources become important during. High flows would be affected by NISP and would not likley be replaced by other water sources. Again, ERO seems to confuse the role of high and low flows in providing different functions (high flows: floodplain connectivity, groundwater recharge, creation of habitat for recruitment and establishment; low flows: maintenance of established vegetation and preventing water stress and associated ills).
11. ERO seems to be confusing Army Corps of Engineers jurisdictional wetland criteria with vegetation associated with riparian areas. Whereas some areas associated, adjacent to, and influenced by rivers (riparian areas) may fall under jurisdictional wetland status, far more does not yet is still dependent upon and responsive to flow regime.
12. ERO considers 0.5 ft of stage change to be a conservative estimate of a stage change that herbaceous vegetation would respond to (p. 48). Assuming that this is a number that is meaningful to plants, over what time interval might one expect vegetation change to occur in response to altered flow? If plants might become water stressed after one day, five day or even ten days of a stage decline exceeding 0.5 ft, monthly averages would not enable one to determine if NISP flows might cause change in the herbaceous vegetation. The amount of variability in stage over the course of a month is not addressed. An average flow that varies by 0.5 ft might average to 0.5 ft while experiencing a range of flows from well outside (e.g., 0, 1.5, 3 ft or more) of this "conservative" value, which would likely result in altered herbaceous vegetation. A daily timestep would be more appropriate to examine possible effects of altered flows on vegetation.
13. "Nonwetland herbaceous vegetation likely would not be affected by changes in stream stage" (p. 48). One of the functions of flow in riparian areas is to support riparian communities but it is also to prevent "terrestrialization" or the encroachment of channels and riparian communities by upland vegetation. Riparian areas typically experience an "ebb and flow" of upland species into and out of riparian areas over the course of time. This ebb and flow is largely dictated by the frequency and duration of high flow events that exclude or disfavour upland species near the river. This is what distinguishes riparian areas from surrounding uplands and non-fluvial wetlands.

When high flows are removed, terrestrialization occurs and riparian areas narrow, become less distinctive, heterogeneous, species rich, and less "riparian".

14. "…woody vegetation , such as willow shrubs and cottonwood trees, likely would be unaffected by changes in stream stage of about 1.5 feet or less, because woody vegetation is more deeply rooted, and physiologically adapted to following the water table downward."(p. 48?) Whereas Populus and Salix seedlings can extend roots to track a falling water table, there is no literature suggesting that established plants (juveniles and adults) can respond to falling water tables through root extension. This is misconception that I have seen before in studies trying to justify lowering of water tables. Salix and Populus have very different root morphologies and maximum rooting depths so should not be considered together.
15. "Where water table declines are greater than 1.5 feet, it is possible that existing woody vegetation could be affected, but research shows that declines of up to 3 feet may not cause death of woody riparian vegetation. Establishment of woody vegetation would likely be more affected by changes in overbank and scouring flows (i.e., 25-year flows)…" (p. 48-49). This being stated, very little consideration of the influences of reduced peaks on vegetation is given in the conclusions. "Simply stated, high flows on the Poudre River below the canyon mouth would become a rarer event with NISP." (p. 53). Linking these two statements and then concluding that "The reductions in streamflows on the Poudre and South Platte rivers associated with the action alternatives are not anticipated to cause a loss of riparian and/or wetland vegetation" (p. 75) is contradictory.
16. ERO states that mean monthly stage would be reduced no more that 0.1 ft under each of the three alternatives (2, 3, and 4). No statement of the variability within a month is provided (p. 49). If this varies substantially, the conclusions made are irrelevant. Again, if the larges mean monthly changes in stage could be as high as 0.36 to 0.61 ft during June, what is the variability around this monthly mean? ERO fails to take any variability into account, yet earlier in the report cite Scott et al. 2000 as having concluded that "sustained declines of the water table of greater than 3.1 feet resulted in 88 percent mortality of plains cottonwood" at their study site. Although it is unlikely that reductions of stage of even 0.61 ft during high flows would not negatively affect maintenance of adult Populus over the short term (e.g., cause water stress), ERO seems to mix flows necessary for regeneration and maintenance, and fails to examine differential effects of different flow alterations on each.
17. There is no basis for the statement that stage reductions of "0.18 feet below baseline conditions in May and June … during dry years are small, and are unlikely to affect riparian and wetland vegetation." (p. 50) or "Based on ERO's analysis of stream stage at the Canyon gage, it is unlikely that stream stage would affect riparian and wetland vegetation in the vicinity of the Canyon gage." (p. 50).
18. "The high flows that would be most affected by NISP do not appear to be providing supportive hydrology for riparian and wetland vegetation in the McMurry Natural Area. Flows above about 2,000 cfs that exceed the stream banks may help with the habitat renewal process and the reductions in these overbank flows may reduce the opportunities to create new habitat for riparian vegetation establishment." (p. 55). This being said, the conclusion ERO makes is that NISP would not negatively affect

vegetation (?).

19. Martinez Natural Area reach: "It is likely that most of the supportive hydrology comes from the lower more frequently occurring streamflows and supplemental sources such as the ditch and nearby ponds."(p. 56) It is unclear what is meant by "supportive hydrology". It is assumed that this is low flow hydrology and how it might affect maintenance of riparian vegetation. No mention is made of the effects of altered high flow on vegetation through this reach. High flows are those most influenced by the alternatives in NISP.
20. Any conclusions that could have been made by logically linking many of the statements about the possible effects of reduced high flows are seemingly discounted in the final conclusions: "Without this disturbance and a substantial reduction in the frequency of this occurrence of overbank flows, it is likely that the woody riparian vegetation will become increasingly decadent. This would be a slow process that would be difficult to separate from current trends in riparian vegetation along the Poudre River." (p. 75).
21. General comment on non-riparian vegetation cover types section of the report: no clear criteria for assessing condition of vegetation cover types is provided, yet in most cases cover types are considered to be of low to moderate quality. Without clear assessment criteria, it is unclear if the rating of quality is simply the opinion of the observer (which is open to bias) or based on something more scientifically defensible.

22. Overall ERO has failed to: 1) link riparian vegetation to streamflow, 2) adequately distinguish between flows necessary to maintain channel integrity and facilitate regeneration of riparian vegetation and flows that maintain established plants, 3) consistently evaluate the role of high flows in maintaining vegetation, 4) to reach conclusions based upon any objective scientific criteria. NISP proposes to have an effect largely upon high flows, so the focus on low flow hydrology and alluvial water tables is a distraction from the real issue. Reductions in high flows will influence regeneration of many riparian species (facilitating encroachment of terrestrial species into riparian areas and suppressing processes necessary for regeneration and establishment of many riparian species - particularly fluvial disturbance adapted species). This will result in changes in population structure of many species over various periods of time ranging from years to decades. Change in population structure of many species results in changes in plant community composition. These factors are not evaluated by ERO, yet they are the crux of the issue. Because peak flows occur over a timescale of less than a month, monthly time steps in considering the effects of reduced peak flows on vegetation are inadequate. There is no stated reason for not taking advantage of daily average flows and examining the extreme flows that vegetation responds to rather than some monthly mean (which riparian plants are less responsive to).

General Concerns Regarding Language Use and Presentation Bias

We have discussed the NISP DEIS with dozens of individuals who have had a chance to read portions of or the entire document and who have professional experience with NEPA documents in general. Nearly all expressed serious reservations about the

persistent bias throughout the document for the action alternatives and against the no action alternative.

For example, there were two technical analyses done to evaluate the likely impacts of the no action alternative on irrigated agricultural lands. The first analysis concluded that up to 69,200 acres of farmland would be impacted. We analyzed the method used to derive this figure and found it faulty and spurious, and apparently the Corps of Engineers agreed because it ordered a separate analysis be done to correct the errors in the first analysis. The second analysis revised the first estimate to 33,637 acres, and clearly documented the errors in the first analysis. Yet, the document refers to this corrected figure only twice that we could find– once in section 4.2.2.1, and once as a footnote to Table 4-8 on page 4-47.

The faulty estimate of 69,200 appears thirty-four times elsewhere in the DEIS. It becomes the foundational figure for fundamental analyses and interpretation related to the economics of the project, environmental impacts, and socio-economic impacts. This faulty analysis weighs heavily in considering which alternative is the least environmentally damaging, skewing the analysis heavily (and wrongly) in favor of the action alternatives.

This situation gives the appearance that a transparently faulty analysis was widely used throughout the NISP DEIS in order to bolster support for the action alternatives.

There are numerous other examples where we find similar issues:

1. The economic analyses hold up speculative benefits of the proposed Glade Reservoir but downplay the economic impacts to river users downstream of the diversions.
2. The environmental impacts analysis excludes major portions of the affected riparian and aquatic corridor downstream of the diversion points, limiting the impact analyses only to the developed reservoir, infrastructure, and pipeline footprints.
3. Conclusions concerning environmental impacts in the DEIS frequently conflict with the supporting technical studies, particularly in the assessment of water quality and riparian forest impacts. Where the technical reports conclude significant impacts, the DEIS consistently overrules them and reports "minor impacts" or "no significant impact", and in several cases concludes significant environmental benefits.
4. The water use analysis excluded major industrial water uses and excluded the highest water use years from the calculations, resulting in a per capita water use estimate approximately 13% lower than it actually was, and then attempted to compare this water use figure with other utility providers for whom industrial water uses were not removed.
5. Likely detrimental impacts are persistently couched using modifiers such as "…may cause…", "…might effect…", "…may occur…".
6. Economic estimates that bolster the proposed alternative are described using terms like "There ***would be*** (emphasis added) an estimated gain of…", when economic factors that bolster the no action alternative are described using language such as "…and a loss ranging from ***$0 to $700,000*** (emphasis added) annually…" when there

is no basis described for the lower bound of zero. For examples of this, see Table 4-1 on page 4-4.

7. From page D-4 of the DEIS: "The ***small flow decreases*** (emphasis added) predicted to occur in May and June are not expected to affect stream water quality." The flow decreases they describe during this period are in the hundreds of cubic feet per second (cfs), compared with the approximate increase of 40 cfs the DEIS proposes to provide in August as mitigation, which is described as "significant". As we saw in many places in the DEIS, no basis was provided for the judgement that it would not affect stream water quality, and it contradicts directly with the findings of the supporting water quality technical reports that predicted water quality would decrease directly with streamflow reductions.
8. On page 2-7 there is discussion of the need for storage elements to regional in nature to be considered. This suggests that even if an analysis found that it would be cheapest and least impactful for each participant to independently develop their own supplies, that smaller, localized options could not be considered. This undermines the objectivity and the scope of the alternatives analysis – along with other limitations placed on the alternatives analysis, it virtually assures that a large reservoir project be selected through the screening process.

There are dozens of examples of this throughout the document, and we would be happy to work with the Corps of Engineers to identify the places in the DEIS where it undermines the credibility of the analysis.

If you have any questions or need clarification on the issues presented in this letter, please contact me at the addresses and phone number below. Thank you for the opportunity to contribute to the analysis of the NISP DEIS.

On behalf of the Save The Poudre Coalition, respectfully yours,

/s/
Mark Easter, M.S. Botany, B.S.E.E.
Chair, Save The Poudre Coalition
Conservation Chair, Sierra Club Poudre Canyon Group
PO Box 20
Fort Collins, CO 80522

Personal address and contact info:
2820 Cherry Lane
Fort Collins, CO 80521
970-224-9214
measter@frii.com

Attachments:

Healthy Rivers, Healthy Communities: A balanced proposal for the Cache la Poudre River in Colorado. File name is STP_Healthy_Rivers_Alternative.pdf

Healthy Rivers, Healthy Communities: A restoration proposal for the Cache la Poudre River in Colorado. File name is STP_Restoration_Proposal.pdf

A Review of the Likely Agricultural Impacts from the Northern Integrated Supply Project. File name is STP_Ag_Impacts_Analysis.pdf

Comments on NISP DEIS Treatment of Preble's Meadow Jumping Mouse. File name is STP_Prebles_comments.pdf

Comments on NISP DEIS Treatment of Fish. File name is STP_fish_comments.pdf

Comments on NISP DEIS Treatment of Birds. File name is STP_NISP_bird_comments.pdf

Form for Nomination of the Cache la Poudre Urban River River as an Important Bird Area. File name is STP_IBA_nomination_form.pdf

IBA Nomination for the Cache la Poudre Urban River Corridor Important Bird Area. File name is STP_IBA_nominination_text.pdf

Fort Collins Audubon Society Poudre River Bird Survey from 2001-2002. File name is STP_FCAS_Poudre_River_Bird_Survey_2001-2002.pdf

Fort Collins Audubon Society Poudre River Bird Survey from 2006. File name is STP_FCAS_Poudre_River_Bird_Survey2006.pdf

City of Fort Collins ad hoc Science Review: File name is STP_ad_hoc_report.pdf