

Glen Canyon Dam Adaptive Management Work Group

Ad Hoc Committee on Strategic Planning

Report to AMWG, January 2000: Principles and Goals, With Comments and Responses

At the January 2000 meeting of the Glen Canyon Dam Adaptive Management Work Group (AMWG), the Ad Hoc Committee on Strategic Planning (committee) will present to you for adoption, a set of Principles and Goals for the AMWG program.

This document is organized to show you the transition from the Goal as you saw it in October, to the Goal that the committee recommends that you adopt at your meeting in January. It shows you the original Goal, the comments the committee received on that Goal, the responses of the committee to the comments, and finally, the Goal, as amended, that the committee recommends that you adopt.

New language is underlined, and deleted language is ~~stricken-out~~.

(Note that Management Objectives are not detailed here, as the Objectives have not yet been fully developed.)

This document consists of the following components, which should be viewed as an integrated whole. Together, they guide the work of the Glen Canyon Dam Adaptive Management Work Group.

- [Vision and Mission](#)
- [Principles](#)
- [Goals and Objectives](#)
- [Glossary](#)

VISION AND MISSION

Adopted by the Glen Canyon Dam Adaptive Management Work Group

July 21, 1999

The Grand Canyon is a homeland for some, sacred to many, and a national treasure for all. In honor of past generations, and on behalf of those of the present and future, we envision an ecosystem where the resources and natural processes are in harmony under a stewardship worthy of the Grand Canyon.

We advise the Secretary of the Interior on how best to protect, mitigate adverse impacts to, and improve the integrity of the Colorado River ecosystem affected by Glen Canyon Dam, including natural biological diversity (emphasizing native biodiversity), traditional cultural properties, spiritual values, and cultural, physical, and recreational resources through the operation of Glen Canyon Dam and other means.

We do so in keeping with the federal trust responsibilities to Indian tribes, in compliance with applicable federal, state, and tribal laws, including the water delivery obligations of the Law of the River, and with due consideration to the economic value of power resources.

This will be accomplished through our long-term partnership utilizing the best available scientific and other information through an adaptive ecosystem management process.

PRINCIPLES

The Glen Canyon Dam Adaptive Management Work Group embraces the following Principles. They guided development of the Goals and Management Objectives for the Glen Canyon Dam Adaptive Management Program (GCDAMP). These Principles are:

| Original Principle | Comments | Responses | Recommended Principle |
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| <p>1. The goals represent a set of desired outcomes that together will accomplish our Vision and achieve the purpose of the GCPA. Some of the objectives and actions that fall under these goals may not be the responsibility of the AMP, but are included here for completeness.</p> | <p>1) While the vision and the goals incorporate the human interaction with the resources, the principles seem to omit human interaction and interpretations. The human component to the ecosystem should be included within the principles.</p> | <p>The committee felt that human interaction was already included, particularly in the Vision and Mission. In order to keep the Goals and Principles as succinct as possible, the committee decided to repeat as little as possible.</p> | <p>1. The Goals represent a set of desired outcomes that together will accomplish our Vision and achieve the purpose of the <u>Grand Canyon Protection Act</u>. Some of the Objectives and actions that fall under these Goals may not be the responsibility of the <u>GCDAMP</u>, <u>and may be funded by other sources</u>, but are included here for completeness.</p> |
| <p>2) Addition of a statement referring to “seeking appropriated and other funds in addition to power revenues.” This approach is clear in the objectives as currently drafted, but the Principles are silent as to program funding. 3) “Look for other funding sources” should be added to #1. Alternatively, address in goals and objectives. 4) The point of this principle is that the Goals are a set. Do we need to address funding in the Principles?</p> | | <p>The phrase “and may be funded by other sources” was added. Other minor changes were made for consistency and easier understanding.</p> | |

| Original Principle | Comments | Responses | Recommended Principle |
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| <p>2. The construction of Glen Canyon dam and the introduction of non-native species have irreversibly changed the Colorado River ecosystem.</p> | <p>5) Human disturbance, air pollution, noise pollution" -> add as culprits to changing ecosystem. 6) The four major threats to the native ecosystem probably are changes in flows, sediment, & temperature from the dam, and the introduction of non-native fishes (the abundance and composition of which is affected by the dam). Human disturbance, air pollution, & noise pollution are probably minor threats in comparison, and don't merit specific mention. We probably could alter the text to state that the dam and non-natives are the primary threats.</p> | <p>The committee felt that noise pollution, etc., were not major components of our charge.</p> | <p>2. The construction of Glen Canyon dam and the introduction of non-native species have irreversibly changed the Colorado River ecosystem.</p> |
| | <p>7) Definition of Colorado River ecosystem (need to define) -> exists in GCMRC workplan (last version). 8) If we need to define CRE, then use the standard definition (...located "primarily" from...). We probably should revisit the idea of having definitions. I would much prefer a glossary to defining each term in the body of the text. 9) Many of the principles refer to "ecosystem" in one way or another. To facilitate clear understanding on the part of all AMWG members and the GCMRC, we recommend the addition of the definition in the Principles (such as could be a revision to Principle 3). We suggest "The 'Colorado River Ecosystem' is defined as the Colorado River mainstem corridor and interacting resources in associated riparian and terrace zones, located from the forebay of Glen Canyon Dam to Lake Mead."</p> | <p>The committee has produced a Glossary where these terms and others are defined.</p> | |

| Original Principle | Comments | Responses | Recommended Principle |
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| <p>3. Much is unknown about the Colorado River ecosystem below Glen Canyon Dam and how to achieve adopted ecosystem management goals.</p> | <p>10) Much is known about Colorado River ecosystem - statement should reflect both knowledge and lack of knowledge. "While great understanding has been gained, much remains to be learned." (Adaptive management) 11) The point is that adaptive management is a necessary approach when dealing with uncertainty.</p> | <p>The committee substituted the word "remains" for the word "is" to address these comments. The phrase "adopted ecosystem management Goals" was changed to "GCDAMP ecosystem Goals" for clarity and consistency.</p> | <p>2-3. Much is-remains unknown about the Colorado River ecosystem below Glen Canyon Dam and how to achieve adopted<u>GCDAMP</u> ecosystem management Goals.</p> |

| Original Principle | Comments | Responses | Recommended Principle |
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| <p>4. The Colorado River ecosystem is a managed ecosystem and will continue to be managed to benefit native and non-native resources, consistent with provisions of the "law of the river."</p> <p>5. An ecosystem management approach, in lieu of an issues, species, or resources approach will guide efforts to develop and implement management objectives and to conduct associated monitoring and research activities.</p> | <p>12) What does "non-native resources" mean? (change "resources" to "species")</p> <p>13) In addition to changing "resources" to "species," add "and cultural and recreational resources"? And add consistent with laws such as ESA, NHPA in addition to the law of the river—or see comment under Principle 7 about placing comment on obeying all laws in one place?</p> <p>14) Add statement about no introductions of non-native species, and no loss of native species either here or in glossary definition of ecosystem management.</p> <p>15) Define ecosystem management as a process that attempts to mimic appropriate ecosystem patterns (abundance and distribution of species and habitats) and ecosystem processes (drivers of ecosystem patterns). See #6.</p> | <p>These Principles were consolidated and re-written for clarity and succinctness. The issues referred to in these comments no longer present difficulties.</p> <p>A statement on "no loss of native species" has been added here.</p> <p>The committee agreed with this comment and defined ecosystem management in this way in the Glossary.</p> | <p>4. The Colorado River ecosystem is a managed ecosystem. and will continue to be managed to benefit native and non-native resources, consistent with provisions of the "law of the river."</p> <p>5.An ecosystem management approach, in lieu of an issues, species, or resources approach will guide our efforts to develop and implement management objectives and to conduct associated monitoring and research activities. <u>Management efforts will strive to prevent any further human-induced extirpation or extinction of native species.</u></p> |

| Original Principle | Comments | Responses | Recommended Principle |
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| <p>6. The adaptive management process attempts to mimic appropriate ecosystem patterns and ecosystem processes, within the legal and management constraints of this regulated system, as a means for achieving adopted ecosystem goals. Some ecosystem patterns or ecosystem processes cannot be returned to their natural range of variability; however, elements of these processes and patterns may be able to mimic the natural range of variability.</p> | <p>16) Change first sentence to "The adaptive management process attempts to achieve adopted ecosystem goals through experimentation and monitoring, within the legal and management constraints of this regulated system."</p> <p>17) Be consistent with either "natural range of variability," "historic range of variability," or "reference variability" throughout the text. Define in the glossary.</p> <p>18) Either split out the natural range of variability concept into a new Principle, or lump EM, AM, and RNV into one Principle.</p> | <p>Rather than defining adaptive management here, it is defined in the Glossary. The Principle is changed to simply say that we will adhere to an adaptive management approach.</p> <p>The committee agreed and complied with this comment. The phrase used throughout the document is "range of natural variability," and it is defined in the Glossary.</p> <p>The committee agreed and complied with this comment.</p> <p>The clause on meeting the intent of the GCPA, EIS, etc. was added to make it clear that we operate within the constraints of these documents.</p> | <p>6-5. The An adaptive management process will be used to achieve GCDAMP ecosystem Goals, through experimentation and monitoring, to meet the intent of the Grand Canyon Protection Act, the Environmental Impact Statement, and the Record of Decision. attempts to mimic appropriate ecosystem patterns and ecosystem processes, within the legal and management constraints of this regulated system, as a means for achieving adopted ecosystem goals. Some ecosystem patterns or ecosystem processes cannot be returned to their natural range of variability; however, elements of these processes and patterns may be able to mimic the natural range of variability.</p> |

| Original Principle | Comments | Responses | Recommended Principle |
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| <p>7. When managing ecosystem processes within the natural range of variability is not the best solution to meet ecosystem goals, or is not possible, experiments will be conducted to test other approaches.</p> | <p>19) Additional experiments should be conducted within "Law of River."</p> <p>20) Do we need to comment up front that all actions will comply with all laws? Or is the third paragraph in the Vision-Mission statement sufficient?</p> | <p>The committee decided that when a concept was in the Vision, Mission, or Principles, it would not be repeated in the Goals. Adherence to the Law of the River is mandated in the Mission.</p> <p>The committee rewrote the Goal for succinctness.</p> | <p>7-6. Management actions will be tried that attempt to return. When managing ecosystem patterns and processes within to their natural range of natural variability. is not the best solution to meet ecosystem goals, or is not possible. When this is not appropriate, experiments will be conducted to test other approaches.</p> |

| Original Principle | Comments | Responses | Recommended Principle |
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| <p>8. Because management actions to achieve a goal may benefit one resource or value and adversely affect another, those action alternatives that benefit all resources and values will be pursued first. When this is not possible, actions that have a neutral impact, or as a last resort, actions that minimize negative impacts on other resources will be pursued, consistent with the final Glen Canyon Dam EIS and the Record of Decision.</p> | | | <p>8.7. Because management actions to achieve a Goal may benefit one resource or value and adversely affect another, those action alternatives that benefit all resources and values will be pursued first. When this is not possible, actions that have a neutral impact, or as a last resort, actions that minimize negative impacts on other resources will be pursued, consistent with the final Glen Canyon Dam EIS and the Record of Decision.</p> |

| Original Principle | Comments | Responses | Recommended Principle |
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| | <p>[See comments under original Goal 26.]</p> | <p>The committee deleted Goal 26 and it became Principle 8.</p> | <p><u>8. Recognizing the diverse perspectives and spiritual values of the stakeholders, the unique aesthetic value of the Grand Canyon will be respected and enhanced.</u></p> |

Category A: Riverine Ecosystem

| Original Goal | Comments | Responses | Recommended Goal |
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| <p>Goal 1. Emphasizing native biodiversity, protect or improve the aquatic foodbase so that it will support viable populations of species at higher trophic levels.</p> | <p>26) If "native" biodiversity is truly what is sought and this equates to historic then we are opposed to this goal. Present biodiversity is much greater and we believe resource managers prefer the newer diversity. We suggest inserting "existing" for "native." 27) Replace "native" with "existing;" protect existing foodbase. 28) Change "native" to "existing." 29) Emphasizing native biodiversity in the aquatic foodbase GOAL is not realistic. Suggest change native biodiversity to existing biodiversity or perhaps simply biodiversity. The food resources now may be largely introduced and exotic (<i>Gammarus</i>). We have no real evidence that native biodiversity is sufficient to maintain the fish community.</p> | <p>The committee deleted the words "emphasizing native biodiversity" because the commitment to emphasize native biodiversity is explicit in the Mission.</p> | <p>Goal 1. Emphasizing native biodiversity, pProtect or improve the aquatic foodbase so that it will support viable populations of species at higher trophic levels.</p> |

| Original Goal | Comments | Responses | Recommended Goal |
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| <p>Goal 2. Maintain viable populations of humpback chub and remove jeopardy.</p> | <p>30) Frame broader goal that includes several more specific goals (#2-6, 7-8): maintain endangered species, investigate reintroduction possibilities</p> <p>31) Combine all native fish together into one Goal (e.g., Establish and/or maintain viable populations of all eight native fish). Define viable in glossary using commonly accepted language from the scientific literature. Add Management Objectives for each species as necessary to define what constitutes viability for the species, what removes jeopardy, what is realistic given the constraints, etc.). This approach sets up the <u>default</u> of restoring the native fish assemblage. If it is demonstrated that restoration of a species is not possible, or not desirable because of irrevocable alterations of the system, then we drop the goal for that species.</p> <p>32) Table 2-7 of EIS should be used to define species of concern (responsibility should also be defined).</p> <p>33) We believe USFWS equates viability with recovery and this program is not intended to recover species; therefore, delete "viable" and replace with "and enhance existing." Also, our goal should be to protect endemic species as listed under Goals 3-7.</p> <p>34) "Remove jeopardy" means from the operation of Glen Canyon Dam, rather than recovery of species.</p> | <p>The committee combined Goals 2 through 6 into what is now Goal 2.</p> <p>"Population viability" is defined in the Glossary.</p> <p>The committee added "or attain" because viable populations may have to be attained before they can be maintained.</p> | <p>Goal 2. Maintain <u>or attain</u> viable populations of humpback chub <u>existing native fish</u> and remove jeopardy from humpback chub <u>and razorback sucker</u>.</p> |

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 3. Maintain viable populations of razorback sucker and remove jeopardy. | <p>35) This Goal is unrealistic and should be deleted. Our best efforts have not established that a population of razorback exists in the canyon: possible only one or two individuals and they have not been seen for years.</p> <p>36) Also, viability equates to recovery and this program is not intended to recover species so this should be deleted in any case.</p> | <p>This Goal was deleted and is now part of Goal 2.</p> <p>The committee decided to retain language in Goal 2 regarding the removal of jeopardy for razorback sucker (consistent with the Biological Opinion) because a jeopardy decision is still in effect.</p> <p>The committee did not intend viability to be equated with recovery. This is clarified in the Glossary.</p> | <p>Goal 3. Maintain viable populations of razorback sucker and remove jeopardy.</p> |

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 4. Maintain viable populations of flannelmouth sucker. | <p>37) Again, delete the term "viable" as this is both unnecessary and confusing.</p> <p>38) Suggest rolling Goal 4, 5, and 6 into one goal as we did previously with BRMO 8. Goal is to achieve healthy self-sustaining populations of native fishes. Mgt. Objectives then need to be SMART.</p> | <p>The committee did not intend viability to be equated with recovery. This is clarified in the Glossary.</p> <p>This Goal was deleted and is now part of Goal 2.</p> | <p>Goal 4. Maintain viable populations of flannelmouth sucker.</p> |

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 5. Maintain viable populations of bluehead sucker. | <p>39) Again, delete the term "viable" as this is both unnecessary and confusing.</p> | <p>The committee did not intend viability to be equated with recovery. This is clarified in the Glossary.</p> <p>This Goal was deleted and is now part of Goal 2.</p> | <p>Goal 5. Maintain viable populations of bluehead sucker.</p> |

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 6. Maintain viable populations of speckled dace. | 40) Again, delete the term "viable" as this is both unnecessary and confusing. | The committee did not intend viability to be equated with recovery. This is clarified in the Glossary. This Goal was deleted and is now part of Goal 2. | Goal 6. Maintain viable populations of speckled dace. |
| Original Goal | Comments | Responses | Recommended Goal |
| Goal 7. Establish population of Colorado pikeminnow. | 41) Disagree with this goal as the canyon is not a viable habitat for pikeminnow as it is too cold. Perhaps this should be part of the package considered by the temperature control device biologists. 42) Goals 2 & 6 are inconsistent with goals 7 & 8. 43) Goals 7 & 8 could address the issue of predator control of non-native species. | The committee addressed these comments by adding the phrase, "as feasible." The committee combined Goals 7 and 8 into one goal, Goal 3, which addresses extirpated species. | Goal 7. Goal 3. Establish Restore populations of Colorado pikeminnow extirpated species, as feasible. |
| | 44) Suggest delete Goal 7, Grand Canyon is not designated critical habitat for this species, efforts toward recovery are likely better expended in other areas. Suggest we spend our efforts on humpback chub, and keeping flannelmouth sucker, bluehead sucker, and speckled dace (the remaining native fishes) from becoming listed. | This comment addresses which Goals should be higher priority. The committee understands that putting the Goals and Objectives into priority order is a future step, not being addressed at this time. | |

| Original Goal | Comments | Responses | Recommended Goal |
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| <p>Goal 8. Establish viable populations of river otter.</p> | <p>45) The implications of this goal should be thoroughly understood before initiating such an effort. This species eats fish and we have endangered humpback chub to worry about already. Their numbers were probably extremely low historically as the river was muddy and they are sight feeders but now with clearer water, their impacts to humpback chub may be severe. Also, we do not know what "viable" means in terms of numbers but assume it means self-perpetuating and this may be problematic for some of the fish species.</p> <p>46) Keep Goal because it is consistent with the Principle to maintain ecosystem patterns. However, add Management Objectives to review taxonomy, define what constitutes viability, and determine whether reintroduction is realistic given the constraints. The default should be to restore any native species unless it can be objectively concluded that the trade-off with other ecosystem goals is undesirable.</p> <p>47) Don't know if this is realistic. Suggest delete. The only available species are exotics.</p> <p>48) Reintroduction otter could be viewed as exotic → rewrite goal (endemic otter is extinct).</p> | <p>This Goal was deleted and is now included in new Goal 7. The committee addressed these comments by adding the phrase "as feasible" to the new Goal 7.</p> | <p>Goal 8. Establish viable populations of river otter.</p> |

| Original Goal | Comments | Responses | Recommended Goal |
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| <p>Goal 9. Maintain a wild reproducing population of rainbow trout above Lees Ferry, to the extent practicable and consistent with the maintenance of viable populations of native fish and removal of jeopardy of endangered fish.</p> | <p>49) Should not restrict hatchery augmentation.</p> <p>50) Change "removal" to "avoidance" (avoidance of jeopardy higher priority than "wild reproducing")</p> | <p>The committee did not feel that this Goal would restrict hatchery augmentation.</p> <p>The clause on jeopardy was deleted because the committee felt that removal and avoidance of jeopardy are presumed in the clause "maintenance of viable populations of native fish."</p> | <p>Goal 9. Goal 4. Maintain a wild reproducing population of rainbow trout above Lees Ferry, to the extent practicable and consistent with the maintenance of viable populations of native fish and removal of jeopardy of endangered fish.</p> |

| Original Goal | Comments | Responses | Recommended Goal |
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| <p>Goal 10. Minimize competitive and predatory interactions by non-native species on native species.</p> | <p>51) Change "species" to "fish."</p> | <p>The committee members deleted this Goal because they felt it was a means to an end, and thus should be an Objective, not a Goal.</p> | <p>Goal 10. Minimize competitive and predatory interactions by non-native species on native species.</p> |

| Original Goal | Comments | Responses | Recommended Goal |
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| <p>Goal 11. Establish water temperature, chemistry, and flow dynamics, emphasizing patterns within the range of natural variability, to achieve ecosystem goals.</p> | <p>52) This may be inconsistent with Principles 4 and 8 that say we should manage the system to benefit native and non-native species (resources). Current variability is different than that found historically and is useful to present species. Changing it to achieve "natural" variability (does this equate to historic?) may be problematic.</p> <p>53) Delete goal #11.</p> <p>54) Retain goal #11.</p> <p>55) Retain Goal because it is consistent with Principles regarding pattern & process. It is important at a native fish as well as an ecosystem scale. The use of "emphasizing" means approaching natural patterns with the understanding that we won't meet it.</p> <p>56) Prefer natural processes.</p> <p>57) Establish or "maintain"? Do we want to establish water temperature within the range of natural variability pre-dam?</p> <p>58) Suggest moving GOAL 11 and MO 12 to a vaguely defined MO (for now) under Goal 4-5-6. I see the attempt to consolidate a series of MO's under one goal.</p> <p>59) What ecosystem is desired? (need to define)</p> <p>60) Principles lead us to more like pre-dam ecosystem (though not completely).</p> <p>61) Goal #11 is the only goal that deals with water characteristics.</p> <p>62) Concern over "within the range of natural variability" -> too broad.</p> | <p>The committee deleted the clause on range of natural variability (RNV) because the commitment to attain RNV is explicit in the Principles. The committee discussed all the comments, and decided to retain the Goal, as amended.</p> | <p>Goal 11-<u>Goal 5</u>. Establish water temperature, chemistry, and flow dynamics, emphasizing patterns within the range of natural variability, to achieve <u>GCDAMP</u> ecosystem Goals.</p> |
| 63) | Also, "ecosystem" is not defined and should be. | "Ecosystem" is defined in the Glossary. | |
| 64) | Make goal #11 a management objective. | The committee felt that this should remain a Goal because it is important at a species and at an ecosystem level. | |
| 65) | "Ecosystem goals" should be defined. | "Ecosystem Goals" means the Goals in this document that refer to the ecosystem, as opposed to, for example, the Administrative Goals. The clause is clarified to read "GCDAMP ecosystem Goals," which is now used consistently throughout the document. | |

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 12. Increase fine sediment storage within the main channel and along shorelines to mimic historic spatial distribution. | <p>66) Goal #12 - concern over "historic"</p> <p>67) How can you mimic pre-dam? Do we know what that is? (for sediment)</p> <p>68) "Historic spatial distribution" talks about relative comparisons between reaches.</p> <p>69) With the creation of GCD I don't know if this is realistic (historic spatial distribution). Glen Canyon (between the Dam and the Paria River) was likely rich in fine sediments historically (if by historically I mean pre-Dam). Achieving that in the future will not be possible without removal of the Dam. Perhaps need to clarify what we mean by "historic".</p> <p>70) "Conserve" rather than "increase" (#12)</p> <p>71) Retain Goal because it is consistent with Principles regarding pattern & process. Could use RNV (or agreed upon substitution) instead of historic to emphasize variability. Could write similar to Goal 11 that uses "emphasizing patterns within the RNV."</p> <p>72) This ("to mimic historic spatial distribution") may be inconsistent with Principle 4 meant to manage to benefit native and non-native species. Suggest changing to: "in as many years as reservoir and downstream conditions allow."</p> | <p>The committee decided to change the language to emphasize the importance of achieving the ecosystem Goals as delineated in this document, as opposed to achieving the mimicking of historic spatial distribution. Defining and then attempting to mimic historic spatial distribution may be attempted as a means to achieving the ecosystem Goals.</p> <p>The phrase "GCDAMP ecosystem Goals" is now used consistently throughout the document.</p> | <p>Goal 12-Goal 6. Increase fine sediment storage within the main channel and along shorelines to mimic historic spatial distributionachieve <u>GCDAMP ecosystem Goals</u>.</p> |
| Goal 13. Prevent any further human-induced extirpation or extinction of native riverine species. | <p>73) Shouldn't be a goal → mission statement.</p> <p>74) Is Goal 13 appropriate as a "goal" or is it included in the "mission statement" already?</p> <p>75) This should be stated in the Principle on ecosystem patterns.</p> <p>76) Delete. This language is more appropriate as a principle than as a goal.</p> | <p>The committee agreed that this was not appropriate as a Goal. It is now part of Principle 4.</p> | <p>Goal 13-Prevent any further human-induced extirpation or extinction of native riverine species.</p> |

Category B: Riparian Ecosystem

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 14. Maintain viable populations of Kanab ambersnail and other endemic spring species. | <p>77) Why worry about "spring species" more than other endemic species? Add to "unique areas/species"</p> <p>78) Suggest we change this to "Maintain viable populations of Kanab ambersnail." The change may have to do with prioritizing goals for the next five-year period.</p> <p>79) Collapse 14-16 into one goal.</p> <p>80) Suggest collapsing 15 & 16 into a riparian goal, but keeping 14 separate as a spring goal.</p> <p>81) Maintain goal 15 (native biodiversity - system).</p> <p>82) Consistent with suggested changes to the native fish goals, this Goal probably should be altered to focus on riverine springs and associated species. In addition to the suggested MOs for KAS (listed above), there should also be MOs for other spring species (e.g., Niobrara & the undescribed species at Vasey's Paradise), and for the springs where introductions of KAS has already occurred. The MOs should lead us to determining what constitutes a viable population, what are the threats, and what it'll take to remove/avoid jeopardy.</p> <p>83) We believe USFWS equates viability with recovery and this program is not intended to recover species; therefore, delete "viable" and replace with "existing" language. Also, our goal should be to protect endemic species. Again, delete the term "viable" as this is both unnecessary and confusing.</p> | <p>The reference to "spring" has been moved to Goal 9.</p> <p>The committee made this change.</p> | <p>Goal 14-Goal 7. Maintain or attain viable populations of Kanab ambersnail and other endemic spring species.</p> |
| | | <p>The committee discussed these comments, and decided to make the changes shown.</p> <p>The committee added "or attain" because viable populations may have to be attained before they can be maintained.</p> | |
| | | <p>The committee did not intend viability to be equated with recovery. This is clarified in the Glossary.</p> | |

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 15. Protect the presence of Southwestern willow flycatcher in a manner consistent with biotic riparian community goals. | 84) Suggest deleting this goal in favor of MO 28 as a goal and replacing MO 28 with a specific, measurable objective for flycatchers. [MO 28 is: Protect, restore, and enhance survival of native and special status avifauna.] 85) Only break out listed species. | Only listed species are specified. The committee changed from "biotic community" to "ecosystem" because the term is more appropriate in this context. | Goal 16-Goal 8. Protect the presence of Southwestern willow flycatcher in a manner consistent with biotic-riparian community-ecosystem Goals. |

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 16. Emphasizing native biodiversity, protect or improve the biotic riparian communities, and reduce or eliminate invasive nonnative species. | 86) Assume this means death to all Tamarisk. Need to think this one through carefully. Riparian vegetation, even if it is exotic, may be better than no riparian vegetation. | The committee did not feel that this Goal meant "death to all Tamarisk." They referred back to the Mission and its commitment to "emphasizing native biodiversity," not to removing all exotic species. The committee moved the reference to spring communities to this goal from original Goal 14, now Goal 7. The committee removed the phrase "emphasizing native biodiversity" because the commitment to emphasize native biodiversity is explicit in the Mission. The committee members removed the phrase, "and reduce or eliminate invasive nonnative species," because they felt it should be an Objective. | Goal 16-Goal 9. Emphasizing native biodiversity, protect or improve the biotic riparian and spring communities, and reduce or eliminate invasive nonnative species. |

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 17. Prevent any further human-induced extirpation or extinction of native riparian species. | 87) Goal #17 isn't "smart" goal (put in principles or mission). 88) Delete. This language is more appropriate as a principle than as a goal. 89) This should be stated in the Principle on ecosystem patterns. | The committee agreed that this was not appropriate as a Goal. It is part of Principle 4. | Goal 17. Prevent any further human-induced extirpation or extinction of native riparian species. |

Category C: Socio-cultural Resources

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 18. Protect or improve the size, number, quality, and distribution of camping beaches, consistent with native ecosystem goals. | <p>90) Suggest deleting "native" from goal as this is too narrow and not consistent with Principles 4 and 8. Again, ecosystem must be defined to ensure consistent usage.</p> <p>91) Delete "native" (#18, 22).</p> <p>92) Add a new goal as follows: "Provide a high quality recreational experience for users of the Colorado River system within Glen Canyon National Recreation Area and Grand Canyon National Park."</p> <p>Under this goal would fit specific beach and rapid objectives. (I guess I would argue that beach and rapid goals are not really appropriate since these resources would be managed for some reason.) Also under this objective would fit some very specific recreational experience objectives, including trout fishing in the Lees Ferry Area. All objectives would need to be fleshed out by the TWG.</p> <p>In my mind, we are obligated to have a recreation goal since the Grand Canyon Protection Act specifically calls for managing GCD to enhance and protect recreation.</p> | <p>The committee agreed with this comment and will change "native" to "GCDAMP ecosystem" when this goal is made into a Management Objective.</p> <p>The committee agreed with this comment, and feels that this new goal is also more consistent with Table II-7 of the EIS. Original Goals 18 and 22 will become Management Objectives under this goal.</p> | <p>Goal 18. Protect or improve the size, number, quality, and distribution of camping beaches, consistent with native ecosystem goals.</p> <p><u>Goal 10. Maintain or improve the quality of recreational experiences for users of the Colorado River ecosystem, within the framework of GCDAMP ecosystem goals.</u></p> |

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 19. Maintain or increase power and energy generation within the framework of adaptive management program goals. | <p>93) Goal #19 not viewed as true statement. Substitute language from Guidance Document pg. 4.</p> <p>94) Benefit all resources - benefit power as well - not in conflict w/ pg. 4 of Guidance Document.</p> | <p>The committee members did not find language on page 4 of the Guidance Document that they felt should be substituted for this Goal.</p> <p>For consistency, the words "adaptive management program" were changed to "GCDAMP ecosystem."</p> | <p>Goal 19. Goal 11. Maintain or increase power and energy generation within the framework of adaptive management program GCDAMP ecosystem Goals.</p> |

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| <p>Goal 20. Protect, mitigate adverse impacts to, interpret, or record knowledge of cultural sites and traditional cultural properties in consultation with affiliated tribes.</p> | <p>95) The NPS will work on rewording Goal 20, which is contradictory. They will use wording out of the 36 CFR 800 (implementing regulations for Section 106 of NHPA). Jan has been out of the office last week and you might check with Lisa Leap (NPS archaeologist based at NAU) at 523-9532 on the status of this.</p> <p>96) Significant concerns raised during the AMWG meeting and some suggested using statutory language in lieu of this language.</p> <p>97) Funding an issue with #20.</p> <p>98) "Recording knowledge" not compatible with GCPA.</p> <p>99) For sites under jurisdiction of NPS, add NPS, Federal agencies and other entities after affiliated tribes - also P.A. signatories → involve these in developing goals/MOs.</p> <p>100)#20 - do no harm vs. protect?</p> <p>101)Add "as appropriate" after "cultural properties" and delete "or" - substitute "or" with "and/or."</p> <p>102)Tribes concerned about dispersing sacred knowledge.</p> <p>103)GCPA requires site protection</p> <p>104)Need more guidance on #20.</p> <p>105)Need to protect other trust assets (incl. Biological/natural resource) → create another goal?</p> <p>106)#20 - concerned w/interpretation of cultural/sacred sites - leave sites as they are, protect sites</p> <p>107)PA participants should provide comments on goal #20 (statutory language) Nancy →</p> <p>108)Archaeology sites can be different from cultural, TCP, sacred sites</p> <p>109)Mitigate if you can't protect.</p> | <p>The committee understands that most or all of the tribes and other interested parties feel this goal expresses their intent for cultural resources.</p> | <p>Goal 20: Goal 12. Protect, mitigate adverse impacts to, interpret, or record knowledge of cultural sites and traditional cultural properties in consultation with affiliated tribes. Preserve, manage and maintain cultural resources for the inspiration and benefit of present and future generations, while making management decisions in consultation with Agency officials, State and Tribal Historic Preservation Officers, local governments, Indian tribes, and the interested public, as appropriate.</p> |
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| Goal 21. Operate Glen Canyon Dam for beneficial consumptive use consistent with existing law and policy. | 110)Goal #21 should be a principle. 111)Goal #21 recognizes consumptive use benefit of Lake Powell. | The committee decided that AMWG has no authority to operate the dam for any purpose; thus, this Goal was deleted. | Goal 21. Operate Glen Canyon Dam for beneficial consumptive use consistent with existing law and policy. |
| Original Goal | Comments | Responses | Recommended Goal |
| Goal 22. Maintain navigability of rapids, consistent with native ecosystem goals. | 112)Suggest deletion of "native" as too limited and inconsistent with Principles 4/8. 113)Delete "native" (#18, 22). | The committee decided that this goal should be a Management Objective under the new Goal 10. The committee agreed with this comment and will change "native" to "GCDAMP ecosystem" when this goal is made into a Objective. | Goal 22. Maintain navigability of rapids, consistent with native ecosystem goals. |
| Category D: Administration | | | |
| Original Goal | Comments | Responses | Recommended Goal |
| Goal 23. Maintain a high quality monitoring, research and adaptive ecosystem management program. | 114)Add <u>accountable</u> between "high-quality" and "monitoring." 115)Suggest deleting the last phrase ("and adaptive ecosystem management") as it is confusing and unnecessary. 116)Delete "adaptive ecosystem management." 117)Because the monitoring and research needs to be focused on providing information for an adaptive ecosystem management program, the inclusion of the term is appropriate. See comment in Principles about "Adaptive Management" v. "Ecosystem Management" v. "Adaptive Ecosystem Management," and be consistent throughout the text. 118)Use consistent terms. | The committee felt that a high-quality program would be accountable by definition. The committee members agreed that the terms used should be consistent throughout the document. In addition, they felt that adaptive management is how we accomplish ecosystem management, and the word "ecosystem" did not need to be included in this clause. | Goal 23. Goal 13. Maintain a high quality monitoring, research and adaptive ecosystem management program. |

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| Goal 24. Build a broad, effective outreach program. | | | Goal 24. Goal 14. Build a broad, effective outreach program. |

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| Goal 25. Broaden the revenue base to achieve adaptive management program goals and objectives. | 119)Be consistent with the term "Adaptive Ecosystem Management" or a substitute. | The committee agreed and made the change. For consistency and clarity, the words "adaptive management program" were changed to "GCDAMP." | Goal 25. Goal 15. Broaden the revenue base to achieve adaptive management program GCDAMP Goals and Objectives. |

| Original Goal | Comments | Responses | Recommended Goal |
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| Goal 26. Respect and enhance the unique aesthetic value of the Grand Canyon, and the diverse perspectives and spiritual values of the stakeholders. | 120)Goal 26 should also be a principle as well as a goal. If it is only a principle, implementing actions may get lost in the roster of items. 121)Elevate concept to a Principle. | The committee changed this Goal to a Principle, and determined that the three suggested MOs ("Conduct meetings to ensure inclusion of diverse perspectives," "Ensure monitoring and research activities are conducted in such a way as to minimize impacts on the aesthetic and spiritual values," and "Fund tribal participation in the adaptive management program") should be retained under a different Goal. | Goal 26. Respect and enhance the unique aesthetic value of the Grand Canyon, and the diverse perspectives and spiritual values of the stakeholders. |