

## **Workshop Minutes**

(Colorado Plateau Rapid Ecoregional Assessment (REA) Workshop 1 Summary,  
Lakewood, Colorado, August 10, 2010)

Highlighted text in **yellow** is relevant to this complaint. To illustrate the difference in how livestock management questions were addressed compared to other management question suggestions (additions or modifications), highlighted in **green** are those which were accepted by BLM, and those in **red** which were rejected or “deferred” to the Washington Office. In addition, our comments are in *red italics*.

**DRAFT**

### **COLORADO PLATEAU RAPID ECOREGIONAL ASSESSMENT (REA)**

#### **Workshop 1 Summary**

Lakewood, Colorado

August 10, 2010

#### **I. INTRODUCTIONS**

*Leigh Espy, Verlin Smith, and Karl Ford* provided welcomes and led group introductions.

*Carmen Bailey* presented the mission of the Western Governors’ Association (WGA) Wildlife Corridor Initiative that involves 19 states. Four states are conducting a pilot project over the next 12 months to collect wildlife and habitat data and to compare data collection and storage methods across the states. WGA will pass their data through NOC as the centralized source. The results may be ready in time to use for the REA. WGA has a white paper describing the process on their website. Carmen thought that Dynamac may consult with TetraTech, WGA’s contractor, to share information and hopefully complement their approaches.

*Karl Ford* presented an overview of the REA process, the major products, and the timing and content of the six workshops. Karl noted that no new research is allowed for the REA, that data gaps will be noted and perhaps addressed in future projects and sub-assessments. The purpose of the REA is to provide ecoregional direction. This is an iterative process; rapid assessments may be re-evaluated every 3–5 years.

Objective of today’s workshop: To make decisions about the choice of conservation elements, change agents, and management questions.

#### **II. PETER LATTIN PRESENTATION**

##### **A. Dynamac’s Overall Approach to Task 1**

The first portion of Pete’s presentation covered an overview of Dynamac’s process for addressing the management questions, ecoregional conceptual model, change agents, and conservation elements. Pete noted that many of the management questions were straightforward what/where? GIS questions and that the major modeling efforts will be reserved for modeling core species.

*Don Banks:* What were the major modifications to the management questions?

*Pete Lattin:* Dynamac suggested modifications to some of the management questions to focus them and to identify those that we thought were outside the scope of this project or those that may involve research rather than collection of existing data. For example, we found hydrologic questions to be beyond the scope of the project.

## **B. Extent of the Colorado Plateau REA Analysis**

The detailed presentation began with a discussion of the spatial extent of REA analysis.

**Issue:** Modeling species beyond the ecoregion and its perimeter 5<sup>th</sup> field HUC buffer area  
*Pete* mentioned that species with a broad distribution would be modeled beyond the boundaries of the ecoregion. *Pete* said that this type of modeling would be useful for projected climate change scenarios and coarse filter modeling and that it will not be hard to deal with the large spatial extent. A discussion ensued about modeling over this broad spatial extent.

*Karl Ford, Verlin Smith:* Both were concerned about others projecting their models from outside the Colorado Plateau into this ecoregion.

*Pete:* Yes, it's true that different modeling efforts may come up with different results.

*Matt Bobo:* For species distributions outside the ecoregion, should we model the whole distribution? Several questioned doing this.

*Bill Merhege:* Other ecoregions will be starting later than us, so we will be modeling ahead of them.

*Wayne Padgett:* Sees positive aspects in treating overlapping distributions and species with most of their distribution in other ecoregions.

*Tom Edwards:* Is concerned that the species distribution modeling is not repeatable. Often there are varying results. Models are hypersensitive to the data used. The question is: What is Colorado's climate projected to be in the future? There will not be agreement or repeatability if various groups do the modeling.

Relationship of 5<sup>th</sup> field HUC buffer to this issue:

*Verlin Smith:* Buffers were suggested to ensure that data from within the ecoregion matched that from other ecoregion REAs.

*Pete Lattin:* The buffer is not really relevant to this discussion; we are concerned here with what factors influence the entire distribution of particular species. We will not be able to deal with climate change issues just within the ecoregion.

*Karl Ford:* We (BLM and AMT) anticipated a qualitative treatment of climate change. Both contractors (Dynamac and NatureServe) propose modeling vegetation, maybe a few select species.

*Don Banks:* BLM NOC wants to coordinate approach?

*Verlin Smith:* Yes, coordinate with other ecoregions.

*Questioner unknown and question unanswered:* If contractors declare their method, will that solve the problem?

This issue—of modeling at least some species' distributions across the species' full distribution rather than limiting to the Colorado Plateau ecoregion— was marked for later discussion. However, we did not have time to return to this issue.

**Action Item:** Dynamac needs further guidance from AMT on modeling some species' distributions more broadly beyond the Colorado Plateau ecoregion especially for climate change modeling.

### **C. Landscape Reporting Units**

Pete presented various ways for reporting the results of the REA, since one reporting unit may be more appropriate than another depending on the subject. Two reporting units suggested by the AMT, 5<sup>th</sup> field HUCs and 30m grids, were accepted by Dynamac and the group. Four other reporting units were proposed by Dynamac: 1) 15 km raster grid to coincide with the climate data we will be receiving, 2) level IV ecoregions (a more detailed resolution than the level III ecoregion that represents the entire Colorado Plateau), 3) major aquifers, and 4) allotments.

*Ed Rumbold:* 5<sup>th</sup> field HUCs don't mesh with level IV ecoregions, that is, 5<sup>th</sup> field is too fine a scale. Data would fit better with 4<sup>th</sup> field HUCs.

**Action Item:** It was suggested that Ed put this in writing and submit with his comments.

A discussion followed about the use of allotments:

*Verlin Smith:* Allotments are related to grazing as a change agent.

*Robin Sell:* We are concerned about the use of allotments. The data is too localized. BLM has litigation worries.

*Pete* responded that we have many similar localized data issues over the whole project. Certain types of data may be relevant at the allotment level. Grazing is active management of the landscape. In addition, the allotment level was a scale of data that might of practical use to BLM field offices.

*Anna Oldak:* Today's workshop is not to deal with data issues. The next workshop will deal with data acquisition and quality.

*Carmen Bailey:* If we are worried about political fallout, maybe we can do allotments and use the data for ourselves.

*Kent Walter:* Suggested the used of game management units as a reporting framework.

*Karl Ford:* Responded that BLM does not manage wildlife or water (though both are managed indirectly by BLM land management). *(NOTE: This comment by Karl is important later when they discuss merging all grazing together, including herbivory by native ungulates. Only livestock are managed by BLM – densities, timings, impacts on rangeland condition ...)*

This issue—using allotments as a reporting unit—was marked for later discussion. We ran out of time and were not able to return to it.

**Action Item:** Dynamac needs further guidance from the AMT on the use of allotments for reporting units.

#### **D. Ecoregion Conceptual Model**

*Pete* presented the overarching ecoregion conceptual model, showing first the relationships between elements without human influence and then with human influence. He stated that it was early in the process; the conceptual model is very general; and that conceptual models will take on a greater role when we focus on specific conservation elements and disturbance pathways and mechanisms. Grazing was added to the ecoregion conceptual model as a change agent and biological soil crusts were added as a conservation element.

*Karl Ford:* Noted that in Workshop 3 Dynamac will present a conceptual model for each conservation element. There were concerns that Dynamac had focused on grazing.

*Pete* responded that it was not Dynamac's intent to highlight grazing, but just to show that it had been added as a change agent. Grazing and agriculture had not been mentioned in the Scope of Work (SOW).

#### **Action Items:**

1. Group suggestions for modifications of the ecoregion conceptual model:
  - Make lines connecting boxes similar between Memo 1 and presentation.
  - Change word *Development* to *Land Use* (and remove additional grazing term).
  - Separate Recreation out from Urban Development and put OHV under Recreation.
  - Reach general group consensus about the elements (boxes) comprising the ecoregion conceptual model (rather than the direction of every arrow).
2. Biological soil crusts were accepted as an additional conservation element pending the availability of data. This topic came up again later in the day.

#### **E. Conservation Elements – Natural Plant Communities**

*Pete* showed the list of broad natural plant communities, suggested by the AMT and accepted by Dynamac, as the first group of Conservation Elements.

#### **Issue 1:** Use of these particular Natural Plant Communities

*Travis Hady:* Are these the most relevant choice? Are they all-inclusive classes over the whole ecoregion?

#### **Group Responses–**

*Carmen Bailey:* These communities are used in the Utah Wildlife Action Plan.

*Wayne Padgett:* These communities are widely used, regionally in SW ReGAP.

*Tom Edwards:* These classes have been agreed upon by many groups, SW ReGAP, Ecological Society of America.

*Wayne Padgett:* There are dozens more classes at various scales of resolution.

The AMT rationale for using these Natural Plant Communities appeared in the initial SOW and it appears again on pages 13 and 14 in Memo 1 (noted by *Lee Grunau*).

*Karl Ford*: The AMT worked for nine months to develop the SOW. These vegetation classes were chosen because they are used regionally, they cover relevant elevational vegetation classes, and they are the matrix for regional wildlife species.

**Dynamac response:** If we start with these classes we may find we will eliminate some or add others depending on the species modeled.

**Issue 2:** The addition of biological soil crusts as a conservation element.

*Verlin Smith*: Can we map their distribution?

*Matt Bobo*: Right now we have spotty data for this, but searching for data on biological soil crusts will point out data gaps. No need to drop biological soil crusts from the list before we know whether there is data for them or not.

*Wayne Padgett* agreed. *Steve Park*: We know where the preferred soils are for biological soil crusts, but their appearance on these soils is variable.

(*Dynamac response*: the appearance of wildlife in appropriate habitats is variable.)

*Ed Rumbold*: Colorado River Salinity Control Forum might be able to provide some data about soil crusts.

*Don Banks*: By Workshop 3, will we know better if this question is feasible? YES

*Kate Kitchell*: Perhaps we could use a surrogate, like vulnerable soils.

*Kent Walter*: Agreed that vulnerable soils could be an alternate conservation element.

*Steve Park*: NRCS is doing vulnerability studies. They may not be done in time to help us within the 18 month time frame of this project however. Can we identify potential areas (for soil crusts)?

*Pete*: That's what we would be doing.

*Kate Kitchell*: USGS has expertise to contribute on biological soil crusts.

**Action Item-Resolution-Dynamac Response:** Dynamac will continue to pursue this issue—whether there is sufficient data to include biological soil crusts as a conservation element—and the group should be able to decide by Workshop 3.

**Unresolved issue:** Should we add vulnerable soils as a conservation element?

## F. Species Conservation Elements

**Issue 1:** Rationales for selecting species of conservation concern

Pete presented the list of species and stated that we could reasonably handle 10-12 species in more detail. Dynamac began with the states' wildlife action plans, where S1 and S2 species

numbered near 1000. The use of NatureServe's database reduced that number to about 150. Most of the species on these lists are of limited distribution if they are species of conservation concern. Pete discussed the fact that there were a number of likely rationales for choosing species and outlined the path that Dynamac followed (also found on pages 6 and 7 of draft Memo 1 submitted by Dynamac before the workshop).

Dynamac accepted the initial AMT list on the premise that if these species were important to the AMT, we had no objections to them; we were reluctant to reject the AMT list of species and start from scratch and felt that the list could be augmented. Dynamac also felt that there would be strong feelings among the group at the workshop about what should go on this list and that we would like to hear the group's opinions and guidance before settling too strongly on a final list.

*Karl Ford, Robin Sell:* AMT looked for species of conservation and management concern and they were not highly rigorous about it. AMT needs input and much of the list is open for discussion.

*Susan Linner:* Suggests golden eagle as raptor, predator. There are major concerns with the golden eagle and wind energy development, oil and gas. FWS is doing a west-wide survey of golden eagles. They have special status under Golden Eagle Act. Ferruginous hawk might be interchangeable with golden eagle.

*Bill Merhege:* Agrees, especially with wind energy aspect. He says we also need more birds, especially grassland and shrubland birds.

*Kent Walter:* Thinks big game differs from class of species we are looking at as conservation elements. Mule deer and elk don't tell us where we have a problem.

*Kate Kitchell:* If native plant communities are the coarse filter, wildlife species represent ecosystem or landscape element. Some of the species chosen were species of economic concern.

*Matt Bobo:* Species should have a relationship to overall ecosystem processes.

*Tom Edwards:* Species need to represent connectivity.

*Steve Park:* We need a species for each functional group.

*Karl Ford:* It would help to have some common species between WGA and this project.

*Lee Grunau:* The criteria for the conservation elements haven't been articulated. It is hard to get everyone on the same page if there are no criteria.

*Pete Lattin:* Two of the criteria in the SOW were state rank S1-S3 and species distribution >5% of region.

*Kate Kitchell:* We are limited in capacity, time, and money. We have to focus on a limited number of species. We want to know about the chosen species' condition, trend, and response to change.

*Carol Dawson:* Why this lomatium?

*Sandy Bryce:* Our approach to choosing endemic species evolved during this process. We were not sure about whether to deal with endemics singly or as a group. This lomatium is representative of the hotspot of endemism on the San Rafael Swell; when we dealt with species selection for the Sonoran ecoregion, we chose *Astragalus*, the entire genus.

**Issue 2:** How to deal with endemics?

*Karl Ford:* Perhaps we could map them by 5<sup>th</sup> field HUC or some other reporting unit that would protect the locations. Map endemics as a group and look at species richness.

*Tom Edwards:* Use the process the IUCN uses. Might be outside our scope of work, but they turn it into a counting or tallying exercise. Beyond that, Tom doesn't see a viable solution to choosing limited number of plant species.

*Wayne Padgett:* Use G1G2 species (world rankings) instead of S1S2 state species rankings. The world rankings are more suited to the large spatial scale of the ecoregion and there will be fewer choices.

**Issue 3:** Choice of fish species: Colorado cutthroat trout and razorback sucker.

*Susan Linner:* The two fish listed are representative. Cutthroat trout is a good choice because of aquifer issues.

*Robin Sell:* Flannelmouth sucker or roundtail chub are from the same ecoregion and habitat, but have a wider distribution.

*Zack Bowen:* Check Trout Unlimited's Assessment of Inland Waters.

*Carmen Bailey:* We can choose between the 3 big river fish when we find out about data availability.

*Someone else added:* or we could use all three big river fish.

**Action Items for species selection:**

1. The list of species as conservation elements will be reconsidered and rescreened in time for the Final Workshop Summary due September 3, 2010. Species will be linked to major plant communities and habitats.
2. Consider G1/G2 species rather than the S ranked species.

Dynamac comment: Regardless of the screening process that will ultimately be used for the final species list, it was instructive to hear the concerns of the group and their choices for the most representative and vulnerable species. If a fully objective screening method does not include some/many of the original AMT list or the workshop participants' list of species, we may have to consider adding some species to the final objectively screened list.

**LUNCH**

**G. Sites of Ecological Value**

All the sites of ecological value that were listed in the SOW and Memo 1 were accepted by Dynamac and the group, including Dynamac's addition of EPA's Environmental Monitoring and Assessment Program (EMAP) westwide (800+ sites) aquatic survey data.

*Kate Kitchell:* Does the list of sites in the SOW include relict areas or isolated mesas?

*Pete:* No, but it could if their locations were identified.

## **H. Aquatic Sites of Concern**

All the aquatic sites of concern that were listed in the Scope of Work were accepted by Dynamac and the group including Dynamac's addition of EPA's EMAP aquatic survey data with reference sites.

*Karl Ford:* Can we have a different title for the EMAP samples?

Dynamac response: How about EPA EMAP-West Aquatic Survey Data or EPA EMAP-West Stream Condition Assessment Data?

*Travis Hady:* Is ecological integrity a separate conservation element?

*Pete:* Ecological integrity is a difficult concept to handle in terrestrial systems. It has taken scientists and the EPA 20 years and enormous expense to develop the concept of ecological integrity in aquatic ecosystems. The concept for terrestrial systems has not advanced that far to date in the peer-reviewed literature. It is a research question that is beyond the scope of this project. We can more easily look at the amount of disturbance rather than trying to define ecological integrity.

**Action Item:** We need final resolution of the ecological integrity issue.

## **I. Change Agents**

The group chose to deal with the most potentially contentious change agent candidate first and there was a full airing of views on grazing: *{NOTE: This statement was not accurate – it was Karl Ford who opened up the review of change agents and stated that the group would address what was clearly the most contentious issue in the workshop out of the planned presentation schedule.}*

### **1. Grazing**

*Pete Lattin:* Grazing is a change agent over which we have control. It will not be dealt with any differently than the other change agents. He listed other ecoregions where grazing is also a change agent, such as the Northern Great Plains, where most of the grazing occurs on private lands.

*Karl Ford:* There was a discussion of this point with the Washington office and with other ecoregions. It is apparent to Karl that grazing was/is a change agent at least historically. BLM conducts land health assessments on allotments (pass/fail) that are not in a formalized database. Grazing is considered a resource within the agency and with a group of stakeholders and there are litigation worries. BLM fears litigation may put a stop to future REAs, but he wants to get through the mine field and do something meaningful.



*Verlin Smith:* This came up repeatedly at stakeholder meetings. We need to address it somehow. Grazing is an economic element, a tool for fire mitigation, and a change agent.

*Susan Linner:* There's grazing and then there's overgrazing. Maybe deal with it generally over all herbivores.

*Kent Walter:* Can support grazing as a change agent if all herbivores were included.

*Wayne Padgett:* Is grazing a change agent, yes, absolutely.

*Carmen Bailey:* We run the risk of not having a legitimate assessment if grazing is not considered.

*Comment, speaker not identified:* It would be intellectually dishonest to ignore grazing.

*Tom Edwards:* We will be laughed out of the room if we don't use grazing. If you have the other range of disturbances, you have to include grazing. We are evaluating all of it.

*Several:* Make grazing management questions more general, deal with big game, wild horses and burros.

*Bill Merhege:* BLM is challenged by everyone on either side of the issue. But the REA is not a decision document, so there will be nothing to litigate.

*Don Banks:* It would be conspicuous if grazing were absent, but deal with grazing in general. Come up with different management questions.

*Pete and others:* Got an example?

*Don:* No, but phrase questions toward linkages between change agents and conservation elements.

*Verlin Smith:* We need to discuss this with other ecoregional AMTs.

*Kate Kitchell:* How can we uncouple historic grazing effects from current grazing effects?

*Sandy Bryce:* We know about the damage that happened at the end of the 19<sup>th</sup> and beginning of the 20<sup>th</sup> centuries, but do we have more recent data on restorations?

*Sherm Carl:* BLM has grazing data on Land Health Standards. Those areas with failing land health measures change grazing management approach. Could link this data to restoration, but the data is patchy.

#### **Action Items for Grazing as Change Agent:**

1. General agreement that grazing should be addressed as a change agent, especially if it included all herbivores.
2. General agreement that grazing should be addressed at least through the data acquisition stage (Workshop 2).

3. The grazing issue will require further discussion by the AMT and the Washington office; they will specify how it should be addressed. The AMT will also compile a set of grazing management questions.

## 2. Other Change Agents

The other change agents, fire, invasive species, urban and industrial development, and climate change were accepted by the group.

*Kate Kitchell:* Suggested adding a few change agents: 1) land treatments such as seedings, chaining, wildlife habitat improvements, post-fire restorations, and hazardous fuels reduction, 2) altered hydrologic regime, and 3) pathogens.

*Nat Frazer:* Suggested human migration, but Pete said that is beyond the scope of the project.

*Kent Walter:* Likes the idea of pathogens. Pathogens would include pine beetle infestations. Kent or someone else suggested the addition of recreation as a change agent.

**Action Items:** Resolve whether to add additional change agents such as land treatments, altered hydrologic regime, pathogens, and recreation.

## J. Management Questions

Pete ran through the long list of management questions. There was general consensus among the group to accept most of the management questions. Those management questions that were deleted or modified and comments about management questions are listed below:

### 1. Species as Conservation Elements

Management Questions:

1. What areas have been surveyed and what areas have not been surveyed?
2. Dynamac suggested revision: What areas are known to have been surveyed and what areas are not known to have been surveyed.

**Resolution:** Changed wording accepted by the group.

3. Where are change agents affecting these habitats and movement corridors? Dynamac suggested revision: Where might change agents have recently (~10 years) displaced or negatively influenced occupied or potential habitat and movement corridors?

*Verlin Smith:* Suggested putting question into past tense and take out word *negatively*.

Discussion about temporal aspect of question:

*Karl Ford:* What is the snapshot now?

*Kate Kitchell:* Need a retrospective analysis to refer to a previous condition.

*Verlin Smith:* Combine past and present.

**Resolution:** The rewording of this question was not fully resolved.

4. Where are current Herd Management Areas (HMAs)?

*Verlin Smith:* Should add: where are HAs?

**Resolution:** Question changed to: Where are current Herd Management Areas (HMAs) and Herd Areas (HAs)?

5. Where are populations exceeding AML?

*Verlin Smith:* Verlin suggested deleting this question because it changes on a yearly basis.

**Resolution:** Delete this question.

## 2. Native Plant Communities as Conservation Elements

### Resolution:

The management questions listed in the SOW were **accepted** by the group. Several questions added by Dynamac about cryptogamic (biological) soil crusts were provisionally **accepted** pending more information about data availability and modeling capability.

## 3. Terrestrial Sites as Conservation Elements

The question: What/where is the potential for future change to these high-diversity sites?

Dynamac suggested changing the wording to: What/where is the potential for future change to these high-diversity sites in the near-term horizon, 2020 (development) and a long-term change horizon, 2060 (climate change)?

**Resolution:** The group **agreed** to the near-term and long-term aspects of the question.

## 4. Aquatic Ecological Features

Where are these aquatic areas?

Dynamac suggested rewording: Where are the surface water bodies and livestock or wildlife watering tanks?

What are the frequencies and magnitudes of flows?

Dynamac suggestion: Which surface waters are likely dependent upon seasonal precipitation, and what are the characteristics of their current seasonal flows?

What is their surface water/ground water connectivity?

Dynamac suggestion: Which surface waters are likely dependent upon groundwater to maintain their ecological integrity?

**Resolution:** The group **accepted** Dynamac's suggested changes to these questions.

What/where is the potential for future change in extent and flows from change agents?

Dynamac suggestion: Where and in what direction are surface water flows likely to change at the scale of the 5<sup>th</sup> Level HU, both annually and seasonally?

**Resolution:** This question is unresolved as to time frame. Put in terms of 2020 and 2060 as other questions related to climate change?

## 5. Aquatic Sites as Conservation Elements

Where is the potential for future change to these high-biodiversity sites?

Dynamac suggestion: change the questions to reflect the near-term and long-term time horizons as suggested above.

**Resolution:** Accepted by the group.

## 6. Change Agent Questions

### Fire:

Where are areas that have a need for change (from fire)?

Where are areas that will have adverse effects with change (from fire)?

Where is fire adverse to ecological communities, features, and resources of concern?

*Todd Richardson:* Include fire as a required element of management.

*Group comments:* 1. The top two questions need a time frame. 2. There are sites that are actively managed for fire exclusion and sites that would benefit from fire.

**Resolution:** Need AMT guidance to revise these questions.

### Invasive species:

Where are areas with restoration potential?

*Kate Kitchell:* They (USGS?) have modeled areas with restoration potential from invasives based on precipitation and soil moisture.

*Zack Bowen:* Done some of that also in Wyoming Basin.

*Wayne Padgett:* Has list of categorized invasive species into groups; he will send Dynamac the list.

**Resolution:** Exact wording of improved question not resolved.

### Urban and Industrial Development:

Where are the areas of potential to change (flow reduction) from groundwater extraction?

Dynamac suggestion: Where are the surface waters that might be vulnerable to flow reduction as a result of groundwater extraction?

**Resolution:** Revised wording accepted by the group.

Groundwater extraction:

Where are areas of high and low groundwater potential in relation to supporting solar power, sustaining species, etc.?

Dynamac needed AMT clarification on this question.

**Resolution:** Approach the question from the point of view of aquifer vulnerability: low, medium, or high risk.

Where are artificial water bodies including evaporation ponds?

Dynamac suggested revision: Where are waterbodies known to be artificial?

**Resolution:** Accepted by the group. NOTE: In later discussion at Sonoran REA workshop, it was noted that evaporation ponds are defined as mining effluent ponds that can poison wildlife, so they are important from that aspect. May want to keep words evaporation ponds in question.

Recharge areas.

**Action Item:** Add another management question related to identification of recharge areas (though modeling response will be coarse).

General agreement to avoid hydrologic modeling and use information from BOR or USGS modeling of hydrologic regime class in Colorado Plateau and Sonoran.

Recreation:

Change title to Recreation *Use* and Development

Where are areas for acquisition that may prevent/mitigate change on non-federal lands?

*Karl Ford:* There may be key wildlife habitat in non-federal ownership that may be a key acquisition target for future corridors.

*Someone responds:* That will cause trouble if it is located on a map.

*Gary Patton:* If you map it as a corridor, you are not putting an x on a particular piece of property.

**Resolution:** This question was deleted.

Air quality:

Where are areas affected by dust on snow?

Dynamac suggestions: Where are areas producing fugitive dust that may contribute to accelerated snow melt in the Colorado Plateau?

And: Where are areas that may have accelerated snow melt rates resulting from fugitive dust?

*Kate Kitchell:* Link dust on snow back to mapping vulnerable soils.

*Lee Grunau:* There is some dispute about snow melt rates from dust. We should consult a BLM air quality expert on this.

*Verlin Smith:* Agrees with revised wording.

#### Grazing:

Dynamac's proposed management questions on grazing as a change agent were deferred pending AMT discussion of the issue and AMT compilation of grazing-related questions.

#### Climate Change:

Where/how will the distribution of native plant communities and invasive species change with climate change?

Could word the question as distribution of *dominant* native plant communities.

*Tom Edwards:* USGS is modeling changes in distribution of four major conifer species.

*Kate Kitchell:* Maybe delete this question but compile existing knowledge. Gather references, might not answer the question, but could gather citations that would be helpful to BLM.

**Resolution:** Unresolved.

Where are areas of potential for fragmentation?

**Resolution:** Unresolved. This question needs a time frame: current as well as future?

Where are areas of potential wildlife habitat change?

Dynamac suggestion: replace *potential wildlife* with *core conservation species*.

**Resolution:** Group accepted suggestion.

Where are areas for carbon sequestration potential now and potential to change?

*Pete:* Observed that this question may be more appropriate for a more heavily forested ecoregion.

*Tom Edwards:* Agreed and suggested dropping the question.

**Resolution:** Question dropped.

Where are aquatic/riparian areas with potential to change from climate change?

*Pete:* Would like to specify types of change.

*Karl Ford:* Could you do riparian area vulnerability to climate change using hydrographs, soil moisture?

**Resolution:** Do not have a resolution of this question recorded.

Where are areas of potential flow change?

Dynamac suggested revision: Where are areas of potential surface water flow change?

*Group comments:* Where are areas that may be *vulnerable* to flow change? May link to changes in precipitation.

**Resolution:** The wording of this question was not resolved.

Where are the areas of potential temperature change?

*Pete:* These would be highly simplified qualitative estimates.

**Resolution:** Delete question.

How will water distribution and availability change with climate change?

This question redundant.

**Resolution:** Delete question.

Where are the areas of potential aquatic species habitat change?

Suggested Dynamac revision: Where are the areas of core conservation aquatic species habitat change?

**Resolution:** Revised wording accepted by the group.

## **K. Output Products**

The output products will be interpretable, useable information for management. The products will be in the form of maps, tabular data, and bibliography. Uncertainty will be made clear in products.

NOC will be housing all the data layers and they will be accessible to all partners

## **L. Wrap up.**

*Karl Ford:* Participants in the workshop get five days to submit written comments. They are due on Monday, August 16.

Dynamac will produce a Draft Workshop Summary by Monday, August 16.

Group comments will be discussed and incorporated during an AMT conference call in seven days, on Tuesday, August 17<sup>th</sup>.

Dynamac will revise the Draft Workshop Summary and produce a Final Workshop Summary by Friday, September 3.