

Appendix 1. Potential changes to social processes and ecosystem services with associated direction of impact as described by workshop participants with example quotes.

Table 1. Workshop participants' responses to the no action alternative.

Social-ecological system characteristic	Potential Change	Direction of Impact	Example Quote
Economic Processes	Local economy – less opportunity	Negative	“[Local people might be] counting on the logging jobs.”
Economic Processes	Local economy – same opportunity	No Change	“[The BOSH proposal] does not deal with economic issues driving the Owyhees.”
Economic Processes	Tension on livestock operators	Negative	“The only thing for me that I perceive changing with a no action alternative would be the future economic activity in the Owyhees, including the way people make a living. With the potential listing of sage grouse, if sage grouse are listed, that puts an added tension on especially livestock operators, which is the major economic activity in the county.”
Institutional and legal processes	Disheartening to land managers	Negative	“So if you’re not going to do anything, it’s really disheartening to everybody that worked all those years, and biologists, and it’s in every plan, the Owyhee [Initiative], the Governor’s task force, the state plan. It would be a big discouragement to everybody.”
Institutional and legal processes	Endangered listing – Greater sage grouse	Negative	“But I think there’s, what I like to say is that, the impact to the people I think may not be as much related to, okay we’re going to have more juniper out there, but it may simply be how a (sage grouse) listing decision affects the community out there.”

Empowerment processes	Stakeholder collaboration – less opportunity	Negative	“There is a lot of agreement that some action is needed and if nothing happens, folks may feel disenfranchised.”
Empowerment processes	Stakeholder collaboration – same opportunity	No Change	“Collaboration efforts exist but litigation will always be a challenge.”
Provisioning	Impact to ecosystem	Positive	“More trees – cooler streams, let nature take its course.”
Provisioning	Decline of historic plant communities	Negative	“The resources itself – historic plant communities, those types of things, they’re going to decline.”
Processing	Ability to balance or restore landscape / ecological processes – more difficult	Negative	“...the ecological site condition will continue to deviate from the historical condition affecting watershed, range & grazing, wildlife.”
Processing	Reduction of watershed functionality	Negative	“When juniper encroaches on springs and streams, it reduces their functionality. There’s at least plenty of anecdotal evidence of juniper leading to springs drying up, reducing water output.”
Supporting	Loss of biodiversity & habitat	Negative	“The area will lose diversity as juniper monocultures develop.”
Supporting	Loss of sage grouse habitat	Negative	“Are we able to actually effectively manage the habitat for sage grouse to offset these big losses we’re going to have?”
Cultural	Availability of areas without treatment for study	Positive	“And as far as not taking trees out, I think that would be great. I realize that it’s actually maybe it gives you an area that you can actually do some studies to figure out what’s going on because you haven’t messed with this, you can have this area

			that hasn't had a treatment on it, maybe somebody can get in there and figure out what was really going on."
Cultural	General enjoyment of the Owyhees – improved	Positive	"Because there won't be this specific manipulation in wilderness."
Cultural	General enjoyment of the Owyhees – no change	No Change	"Action or no action will have minor effect if any"
Cultural	Loss of open space	Negative	"There would be loss of open space...you would lose the sagebrush views."
Cultural	Limits on recreation	Negative	"[Big impact to Owyhee County] on recreation...everything from motorized, which a lot of people use down there...no hunting season for the sage grouse."
Cultural	Less aesthetic enjoyment	Negative	"Aesthetic enjoyment would decrease for me [due to] loss of sagebrush/sage-steppe."
Cultural	Hunting – diminished	Negative	"Areas will have reduced value for human activity as juniper continues to expand = decreased recreation, hunting, decreased quality areas for wildlife."
Cultural	Spiritual experience - diminished	Negative	"I think the [spiritual] opportunities available now are a result of the landscape available if it changes these may cease to exist."
Cultural	Spiritual experience – no change	No Change	"You know for me with the exception of the spirituality portion because I think you can find the spirituality of it whether they're sagebrush, sage grouse, junipers – there's a beauty in whatever aspect of it."

Table 2. Workshop participants' responses to the full suite alternative.

Social-ecological system characteristic	Potential Change	Direction of Impact	Quote
Economic Processes	Local economy – more opportunity	Positive	“Grazing will be improved and juniper control could hopefully prevent ESA listing thereby preventing regulation and control of producers.”
Economic Processes	Ability to make a living - improved	Positive	“More jobs for loggers.”
Institutional and legal processes	Ability to make a living – no change	No Change	“I don’t see much in that change...the ability for people to actually make a living out there. If we’re focusing on just these Phase I, Phase II [juniper stands], visually, as I go out there, I’m not going to see that much of a difference. I’m not going to experience that much change because we’re talking about small scale.”
Institutional and legal processes	Management – improved	Positive	“Management would be better through active work on the ground.”
Institutional and legal processes	Management – worse	Negative	“And we have enough problems as it is and when we do stuff like that it makes us look even worse, especially this thing here... You know we have our plan it sounds great on paper, but when we don’t get the money from Congress or whatever to follow through, then we end up dealing with this next thing that happens.”
Institutional and legal processes	Management – no change	No Change	“The future of the efficiency – of the effectiveness of the management of our supply of natural resources aren’t going to change by us simply removing the junipers...at some point in time once the juniper are gone and we’ve created

			this habitat for sage grouse, let's go back to doing something that's not going to bring the juniper back again."
Institutional and legal processes	Worsened agency reputation	Negative	"I work for the BLM, that's my job. I'm not here representing the BLM, but I actually work for the BLM. And we have enough problems as it is and when we do stuff like that it makes us look even worse."
Empowerment processes	Stakeholder collaboration – more opportunity	Positive	"People will see the fruits of the labor and will want to keep collaborating if their contributions are influencing positive change."
Provisioning	Range and grazing - improved	Positive	"I think if it's implemented, we're trying to get this juniper removed, that will improve range conditions, and it will improve grazing. It will improve ranching operations. And I think if we're able to use equipment and masticators and stuff, then we can have a bigger impact on juniper encroachment and reduce it at a bigger scale than what we're limited to hand crews and stuff."
Processing	Increased watershed functionality	Positive	"Increased watershed and overall ecological health."
Processing	Increased fire danger	Negative	"But when it gets down to actually implementing it I'll bet you we end up with a bunch of dead trees out there that look like crap that maybe you're going to end up catching or actually causing the fire because now you've got all this dead wood that you've left laying around."
Supporting	Increased biodiversity	Positive	"Taking action in areas where we will see the most positive + cost effective benefits = more habitat for wildlife, lands for hunting/recreation; hopeful treatment/action to improve sage-grouse habitat – keeping it from being listed, and more

			diversity.”
Supporting	Wildlife habitat – improved	Positive	“I think it’s agreed that sage grouse is kind of a keystone species that if the habitat is improved for them, deer and elk and a vast majority of other species kind of are also positively benefitted,”
Supporting	Wildlife habitat – degraded	Negative	“A lot of blue birds, chickadees other birds that are cavity nesters, they need junipers to nest in. So they would definitely be affected...”
			“One of the issues, if you do have a lot of mechanical treatment, you do have to worry about noxious weeds. And hopefully the outcome is good. And you do have to worry about soil disturbance. And also disruption of wildlife and if it’s a sensitive nesting time or things like that.”
Supporting	Sage grouse habitat - maintained/improved	Positive	“I think it’s agreed that sage grouse is kind of a keystone species that if the habitat is improved for them, deer and elk and a vast majority of other species kind of are also positively benefitted.”
Cultural	General enjoyment of the Owyhees – improved	Positive	“Increased diversity of animals and habitat will create better experiences for more people with diverse interests,”
Cultural	Solitude – no change	No Change	“I’m trying to keep in mind the scale of what we’re talking about as far as Phase I, really early Phase II juniper. Yes, it’ll be a success for us if we’re actually able to do something out there, but as far as any other changes that are occurring, I guess personally I don’t see much in that change... as far as... people’s feeling of solitude.”
Cultural	Hunting – improved	Positive	“Taking action in areas where we will see the most positive

			+ cost effective benefits = more habitat for wildlife, lands for hunting/recreation; hopeful treatment/action to improve sage-grouse habitat – keeping it from being listed, and more diversity.”
Cultural	Recreation – disrupted	Negative	“The treatment activities will be disruptive to recreationists for a period of time.”
Cultural	Recreation – no change	No change	“For instance, well it hasn’t changed the future physical space that’s suitable for human activities. I guess it depends on what human activity you want. If the junipers are there, there’s a human activity that can still be used whether it’s watching birds or it’s hunting whatever the case. You remove those junipers, to some degree, those human activities are still available – may not be the <i>exact</i> same.”
Cultural	Viewshed – improved	Positive	“...for me personally, it would improve because I’d be able to go out to that lek and not see that juniper stand there anymore. So for me personally, I’m going to get to go out and be like, “Wow, this is awesome.” I feel like we accomplished exactly what we set out to do. I can stand and look at those birds and not see the juniper in the background.”
Cultural	Viewshed – degraded	Negative	“I know when I was at a Wildlife Refuge eight years ago, BLM came in around that area and cut down all the juniper trees, and they just laid there for years. And eventually they went and they started burning them up, but that was such a black eye for the BLM. The locals around there, they’re all like, “Freaking waste.” All these trees lay and it looked like crap.”
Cultural	Viewshed – no change	No Change	“...the average Joe is still going to drive into Mud Flat

Road and see exactly what they've always seen. They're not going to realize that on the ground, there have been people that have been removing junipers out there to improve sage grouse, or for whatever. Most people aren't going to notice that."

Cultural	Spiritual experience - improved	Positive	"But for the scope of this project, it will improve my personal spirituality or whatever, if you will, because I can actually now visually see this – no more trees within this area, this lek, these encroaching junipers are gone,"
Cultural	Spiritual experience – no change	No Change	"Again I go back to the fact that I can find beauty in a butterfly on a juniper as easily as I can find beauty in a butterfly on a sagebrush. So that aspect of my spiritual portion of it doesn't change by the fact that we do or do nothing to it."
Cultural	Culture tied to cowboy & sage grouse - maintained	Positive	"It's not just the cowboy aspect. I love sage grouse, you know. And I think having all the tools available, having all the resources available is from the get-go probably the best option."

Table 3. Workshop participants’ responses to the cut and scatter alternative.

Social-ecological system characteristic	Potential Change	Direction of Impact	Quote
Economic processes	Local economy – more opportunity	Positive	“More jobs.”
Economic processes	Weakening of local livelihoods	Negative	“BLM regulations would probably still be a limiting factor in ranching operations.”
Economic processes	Range and grazing – reduced	Negative	“Ranchers/cowboys would not do well grazing would be reduced / riding the range reduced.”
Institutional and legal processes	Management effectiveness – diminished	Negative	“The efficiency of management would be reduced since mastication and jackpot burns are useful tools for juniper encroachment,” and “So if those tools aren’t available, you may not treat the acres you’d like or as effective as you’d like.”
Empowerment processes	Stakeholder decision-making – no change	No Change	“A change is not possible – unless litigation process is changed.”
Provisioning	Ecosystem health and characteristics - improved	Positive	“In 5-15 years there would be some improvement in soil and water resources. Grasses would improve also.”
Provisioning	Increased water availability	Positive	“...getting that functioning ecosystem we can pretty much all agree on...without water, nothing functions...water is the sustaining thing of life, period.”
Processing	Watershed functionality - improved	Positive	“slowed on fields and hills” and when “you get snow blowing up against the back end or on the north face, then you’ve got extra protections.”

Processing	Increased fire danger	Negative	“...increased fire danger, fuel after it dries out, which would have a big negative impact,” and “I think leaving all the wood down is a fire hazard and probably has other environmental consequences.”
Supporting	Wildlife habitat – improved	Positive	“...at least we’re getting trees cut and slashed, and that’s great. That’s a lot better than doing nothing. A whole lot better, in my book, than doing nothing,” and “We’re talking about mostly Phase 1. We’re talking small trees – those can get dropped pretty darn low to the ground, and there won’t be a lot of fuel buildup in those areas. So there are going to be a lot of positives, even if that’s what we were to do for the sage grouse.”
Supporting	Sage grouse habitat - degraded	Negative	“...if it’s [juniper branches] left laying there, the sage grouse are not going to walk through that probably either.”
Supporting	Increased cover for sage grouse predators	Negative	“...it’s cut and scatter, so that’ll take some of the cover away. It’ll leave more of the just the bowl, and the branches will be scattered out. But there’s the potential it could create more cover.”
Cultural	Viewshed - degraded	Negative	“Negative visual impact to the public. A pile of dead trees laying on the ground... it just doesn’t look natural,” and “I will see those trees still lying down in some areas that will not necessarily improve sage grouse habitat.”
Cultural	General enjoyment of the Owyhees – no change	No Change	“Landscape features would be about the same as cut trees would take a long time to decay. If trunks are used for fire wood or other purpose this would help in this area.”