Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Rocky Mountain Region / Black Hills National Forest

October 2023

Ecological Integrity of Forested Ecosystems: Status and Trend

Comments and Responses on Draft Assessment

Black Hills National Forest, photographed from Inyan Kara Mountain in northeastern Wyoming.

Introduction: Assessment Response to Comments

The Black Hills National Forest received a variety of public comments on draft assessments published in June 2022. Some commenters have expressed support for the draft assessments, while others have expressed concerns.

Those who express concern about the draft assessments often state that they believe the assessments do not go far enough in addressing the challenges facing the Black Hills National Forest; do not address the needs of local communities; or do not utilize the best available scientific information. Those that support the draft assessments often state that they are pleased with the level of detail and analysis that went into the assessments. They believe it will provide a good foundation for the need to revise the land management plan.

The Forest Service has reviewed all public comment received on the draft assessments and used this feedback to revise assessments where appropriate. The table below is a detailed summary of public comment received related to forested ecosystems as well as the agency's response to each item. Many responses indicate where the revised assessment has been modified to better explain each item, or incorporate new information as provided by cooperators or the public.

Each comment and response table is provided not as a matter of regulatory compliance, but as an effort to demonstrate the Black Hills National Forest's committment to transparency early in the plan revision process. Some comments below have been generalized or combined with similar comments to provide a more efficient response. No attempt has been made to retain a link between each comment and individual, organization, or entity that provided it.

Response to Comments

Comment	Responses
Pew commissioned the research nonprofit Conservation Science Partners (CSP) to analyze the relative ecological value of individual national forests based on a set of science-backed indicators related to biodiversity, carbon storage, connectivity, and climate resilience. We believe the information in this report can be used by the Forest Service – in collaboration with a broad range of stakeholders – to design an updated forest plan for the Black Hills that achieves the 2012 planning rule's ecological integrity and sustainability requirements.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process, during which management areas and management area direction are defined.
The average Diameter Breast Height (DBH) of trees across the Forest has been reduced. Large trees are becoming scarcer all the time. I suggest that you create a diameter cap of 18 inches for commercial timber harvesting.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process, during which management areas and management area direction are defined.
The term "forest expansion" used in this Assessment sounds like a land acquisition, not trees growing into the grasslands. The WDA recommends using the term conifer encroachment to describe forested areas moving into the grasslands.	No change made since language in Murphy 2017 that is cited uses the term "forest expansion".

Comment	Responses
“Fire exclusion likely led to forest expansion into grasslands in the Black Hills although change in climate and/or increased livestock grazing may also have contributed (Murphy 2017, Brown and Sieg 1999)." Recommendation: Murphy 2017 actually states "Brown and Sieg found that fire exclusion was likely the major driver of forest expansion into grasslands in the southern Black Hills and that grazing and climate had minimal impact." There is no substantive data to show grazing, particularly livestock grazing, is a causal factor for conifer encroachment into the grasslands. The above statement should read: "Similarly, fire exclusion is the main cause of conifer encroachment into the grasslands in the Black Hills. Climate change and domestic and wildlife grazing has minimal contribution to forest expansion." (Murphy 2017, Brown and Sieg 1999).	The assessment was revised to clarify this point. Rather than use the suggested text, revised text was taken directly from Murphy (2017).

Comment	Responses
"Dense forests in conjunction with overgrazing in the early part of the century changed the herbaceous and shrub communities of the Black Hills (Shepperd and Battaglia 2002). Increased density led to substantial loss in diversity and biomass of understory species (Murphy 2017)." Recommendation: Again, the assessment is identifying overgrazing as a significant contributing factor when Brown and Sieg 1999 stated "It is likely that recent encroachment has been more the result of fire exclusion than possible shifts in competitive relationships between grasses and woody plants that resulted from grazing alone." Literature sited in the assessment indicated fire exclusion as the primary factor for increased density of ponderosa pine in grassland ecosystems and hence the casual factor for loss of diversity and biomass of understory species.	Verified that these statements are in Shepperd and Battaglia 2002 and Murphy 2017. The focus of this section is the link between overstory density and understory productivity. So, while overgrazing is directly mentioned in Shepperd and Battaglia (2002), the text was updated with the reference to overgrazing removed.

Comment	Responses
"Dense forests in conjunction with overgrazing in the early part of the century changed the herbaceous and shrub communities of the Black Hills (Shepperd and Battaglia 2002). Increased density led to substantial loss in diversity and biomass of understory species (Murphy 2017)." Recommendation: The Black Hills is picking statements within the literature to overstate grazing as a significant factor in changing the herbaceous and shrub communities. If the Black Hills National Forest cannot provide data supporting the historical impacts of grazing on shifting plant communities within the forest, then the statements must be removed. Additionally, the assessments should not focus on historic uses, but must document current conditions and management practices on the forest using current data.	Thank you for your comment. The author verified these statements are in Shepperd and Battaglia 2002 and Murphy 2017. The focus of this section is the link between overstory density and understory productivity. So, while overgrazing is directly mentioned in Shepperd and Battaglia (2002), the text was updated with the reference to overgrazing removed.
“Grazing from livestock and wild ungulates is a stressor in aspen ecosystems.” Recommendation: Language in the remaining grazing section states: "While one study suggested browsing did not seriously reduce regeneration, regeneration failures were observed (Shepperd and Asherin 2004)."	Statement was revised to indicate browsing "can be" a stressor in the aspen ecosystem. The rest of the paragraph as well as the next explain how browsing from livestock and wild ungulates can be a stressor in aspen ecosystems.

Comment	Responses
"Aspen systems with high ecological integrity experience moderately frequent fire, low amounts of grazing and browsing [emphasis added], historical levels of insect and diseases, and, in riparian areas, are supported by the activity of beaver. Recommendation: 1. Low amounts of grazing and browsing are not defined and arbitrary. 2. Reword the sentence to say, "properly managed grazing and browsing based on current conditions...". There are situations when properly timed high intensity, short term grazing is needed in the area to benefit the aspen community. The forest must provide flexible management options to accommodate changes in the forest vegetative community. 3. Determining stocking rates for livestock is a project level decision. The Assessment should focus on current conditions based on existing plan conditions and documented in the AOI.	Text describing aspen ecosystems with high ecological integrity was revised to list adequate regeneration, rather than low amounts of grazing and browsing.

Comment	Responses
"Grazing from livestock and wild ungulates is a stressor in the aspen ecosystem and fencing and other similar measures to prevent this browsing are difficult to do at large scales, with browsing also being an important infection route for canker fungi." Recommendation: 1. Provide monitoring data showing grazing practices have impacted aspen communities in the Black Hills National Forest. 2. The Black Hills National Forest has already stated in the Rangeland Assessment they "work with permittees to achieve proper use of the forage resource and maintain harmony with other resources and uses." (Forest Plan Revision Assessment: Rangeland Management pg. 1). Working with grazing permittees to reduced perceived stressors on aspen saplings is a project level management action and should be addressed during annual permittee grazing meetings.	Statement was revised to indicate grazing "can be" a stressor in the aspen ecosystem. Addition to the text was made: However, as stated in the Rangeland Assessment, the Forest works with permittees to achieve proper use of the forage resource and maintain harmony with other resources and uses. Working with grazing permittees to reduce stressors on aspen saplings could and should be addressed during annual permittee grazing meetings.
"Additional stressors in this ecosystem include grazing by livestock and wild ungulates and nonnative invasive species, both of which can lead to reduced or no bur oak recruitment..." Recommendation: Please provide data collected on the Black Hills National Forest to support this statement. If there is no data, the statement is speculative and must be removed.	Revised text: Additional stressors in this ecosystem can include grazing by livestock and wild ungulates and nonnative invasive species, if they lead to reduced or no bur oak recruitment (Ripple and Beschta 2007, Gucker 2011). However, as discussed below, data do not indicate a concern regarding oak regeneration and recruitment on the Forest.

Comment	Responses
"Bur oak is drought tolerant, although drought, combined with additional stressors, such as grazing, may cause species decline (Sieg 1991). This sentence was not cited in its entirety. [emphasis added]. The entire sentence is cited below: "Although bur oak is a relatively drought-tolerant species, historical evidence [emphasis added] suggests that drought, in combination with severe winters and grazing has contributed to bur oak decline." Recommendation: 1. The historical evidence from the article is not cited in the dissertation. The sentence is speculative and provides no supporting data. 2. Additionally, the author refers to historical conditions in Missouri as well as historical conditions in the Black Hills in the paragraph without stating which state is referenced. 3. Historical data cannot be used to support current conditions on the forest. The Black Hills National Forest should remove this sentence.	Text was revised to more closely match language in Sieg 1991. Sieg 1991 discusses the historic evidence immediately after that statement is made. Text of concern discusses how drought, in combination with severe winters and grazing, can contribute to bur oak decline. It does not state that is the current condition on the Black Hills. The summary of ecological integrity for bur oak clearly indicates this species is doing well in the Black Hills and is rated with high ecological integrity.

Comment	Responses
"Bur oak systems with high ecological integrity experience frequent fire, low amounts of grazing [emphasis added] and nonnative species, and have adequate bur oak recruitment, which leads to sufficient mast production, a diversity of bur oak in terms of tree sizes, and the presence of downed wood and snags." Recommendation: 1. Provide monitoring data showing grazing practices impact bur oak communities in the Black Hills National Forest. 2. The Black Hills National Forest has already stated in the rangeland assessment they "work with permittees to achieve proper use of the forage resource and maintain harmony with other resources and uses." (Forest Plan Revision Assessment: Rangeland Management page. 1). Working with grazing permittees to reduce perceived stressors on bur oak communities is a project level management action and should be addressed during annual permittee grazing meetings.	Revised text to remove reference to grazing and put focus on bur oak recruitment: Bur oak systems with high ecological integrity experience frequent fire, have adequate bur oak recruitment, which leads to sufficient mast production, a diversity of bur oak in terms of tree sizes, and the presence of downed wood and snags.
Page 25 of the at-risk assessment states: "...no issues are anticipated with maintaining bur oak on the landscape [emphasis added] and maintaining the ecosystem services it provides, such wildlife habitat and forage and cultural value." It is unclear why management recommendation is made which could impact grazing permittees when the forest states there are no issues maintaining bur oak on the landscape.	This sentence, in the at-risk assessment, was taken verbatim from the forested ecosystem assessment. It is still in the forested ecosystem assessment. No management recommendations are listed for bur oak that specifically reference grazing. (See Need for Change Section for Bur Oak.)

Comment	Responses
Rocky Mountain Juniper Concern: "It is likely juniper has increased in extent due to fire exclusion and other factors such as climate change and grazing have allowed for the expansion of juniper woodlands into meadows, grasslands, and other types (Scher 2002, USDA Forest Service RMRS 2021). Recommendation: 1. Again, this above statement is speculative. The document referenced is a USFS document and does not provide any data to support grazing as a contributing factor to increased juniper on the grasslands. 2. Provide data to support the above statement or remove the statement from the document.	Slightly revised text to describe that is a major factor controlling the distribution of Rocky Mountain juniper. In general, it is believed that reduced fire frequency, along with climate change and introduction of grazing, accounts for the expansion of juniper woodlands into meadows, grasslands, and other types that began in the late 1800s. Prior to this time, more frequent fires probably maintained low density in woodlands and often restricted junipers to rocky sites (Scher 2002, USDA Forest Service RMRS 2021).
I read a soon to be published paper by Robert Tatina (2022) entitled "Changes in size class distribution of Black Hills, SD ponderosa pine due to logging, fire suppression, and livestock grazing." He used historical data from General Land Office surveys (1875 to 1915) and compared it to Forest Inventory and Analysis data (2011-2016). His figure 2 is a striking picture of the loss of the larger diameter size classes in the current trees.	Thank you for the reference. Information from Tatina and Hanberry (2022) - Historical forests of the Black Hills, South Dakota, USA, determined using General Land Office surveys -was added to the assessment.
I understand that there is pressure from special interests who make large donations to our Congressional delegation. The politicians then apply pressure at all levels to USDA Forest Service personnel. Please stay with the science and do not let the timber harvest exceed a sustainable level in the Black Hills National Forest.	Thank you for your comments. Timber program levels as defined by the Sustained Yield Limit, Project Timber Sale Quantity, and Project Wood Sale Quantity will be based on the best available science and data and will be developed during the next phase of the forest plan revision effort.

Comment	Responses
Please allow groves of Spruce to thrive where they grow. Clearing Spruce stands to allow for more profitable Ponderosa Pine stands (timber sales) is not good forest management. It is serves as commercial forest management only.	Early forest inventories such as the Graves Report (1899) indicate that the distribution of white spruce across the forest at the beginning of the twentieth century was much lower than the current extent of the spruce forest. Two white spruce habitat types occur on the forest. Pure spruce stands have always been dominated by spruce with varying, disturbance driven levels of ponderosa pine, aspen, and other hardwoods as minor components. These forest types occupy a small niche on the moister, northern aspects, and are dominant near riparian areas. The second type of white spruce forest is considered a mixed species type. These areas would have had higher levels of pine and hardwoods under a more frequent fire regime.
The Department appreciates the recognition in this document that long-term even-aged management of ponderosa pines stands has led to "ecological conditions with lower structural and spatial heterogeneity and reduced resilience to native ecological disturbances such as mountain pine beetle epidemics and wildfire, and consequently, lower ecological integrity. " While "Uneven-aged management in ponderosa pine is only about 5% of the timber management program. Uneven-aged management results in higher structural and spatial heterogeneity and higher resilience to fire, insects, and disease relative to even-aged management. It better mimics the historic forest structure in ponderosa pine (as described more below) and results in higher ecological integrity." As such, the new forest plan should increase the amount of heterogeneity within and between pine-dominated timber stands.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process. See also the expanded discussion regarding uneven-aged management in the Timber Assessment.

Comment	Responses
During the drafting and revisions of the current forest plan, the Department provided written and oral comments recommending that the US Forest Service (FS) manage ponderosa pine stands for significant increases in heterogeneity. As noted in this and other documents, less than 5% of the Black Hills National Forest ponderosa pine stands have been managed towards uneven age structures. Consequently, the Department reiterates the recommendation that the new forest plan seek to increase the heterogeneity of ponderosa pine stands on the Black Hills National Forest to promote healthy, functional wildlife habitats, produce forest products, mitigate fire and insect losses, ensure species viability, and allow for other multiple uses such as livestock grazing and recreation.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process.
The Department supports the needed changes to the forest plan identified in the draft assessment. Specifically, as cited in the draft, the revised forest plan should: 1. Focus on a desired forest structure in ponderosa pine that is more uneven-aged and spatially heterogeneous as was found historically. 2. Focus on restoring more frequent surface fire across the ponderosa pine ecosystem. 3. Have an emphasis on sustaining the existing late successional habitat and take actions to develop late successional habitat over time.	Thank you for your comment.

Comment	Responses
The section on white spruce stands notes the importance of this habitat type for American marten and several rare snails, along with a number of bird species that are found almost exclusively in white spruce forests of the Black Hills. The assessment also cites spruce forests as being used by species such as elk for summer-fall range and thermal and hiding cover. The Department encourages the USFS to continue to manage spruce stands on the Black Hills National Forest to benefit these species and maintain or increase the amount of this habitat type on the forest.	Thank you for your comment. Specific management recommendations will be considered and evaluated during the upcoming plan revision stage of process.
The section on aspen highlights the role and importance of beaver on the forest and notes the "drastic reduction in beaver populations using the riparian aspen forests on the Black Hills." As such, the Department recommends the new forest plan call for reintroduction of beavers to help "restore riparian processes, increase aspen growth and diversity, and buffer ecosystem sensitivity to extended drought, " as called for in the assessment.	Thank you for your comment. We agree that beaver have had an important role in Black Hills ecosystems and look forward to working with stakeholders and the public to define roles for management and beaver populations during the upcoming plan revision phase of the process.
The introduction of this assessment gives a great description of why we should care about the Black Hills.	Thank you for your comment.
The assessment pretty much states the obvious. Our pine ecosystems would have higher ecological integrity if we did more Rx burning and switched to uneven-aged timber stand management. When people both in and outside of the Forest Service throw up blockades (real or perceived) to doing these two things, they are basically saying we can't have ecosystems with high (or even medium) ecological integrity.	Thank you for your comment.

Comment	Responses
This assessment seems to not fully acknowledge the detriment smooth brome (Bromus inermus) has and will have – in exponential fashion – on the integrity of our ecosystems.	Smooth brome is addressed in other assessments, such as the ones covering rangeland/non-forested ecosystems and insects, disease, and invasive species.
Given the complexities of heterogeneity, contingency, and multiple interacting drivers, predicting future ecological change is difficult. However, this section (page 11) is a realistic appraisal of the challenges Black Hills ecosystems face and points to the importance of using tools we know will help, like converting immediately to un-even-aged management (will take time) and restoring and maintaining fire regimes with prescribed burning.	Thank you for your comment.
Please explain the difference between woodlands and forests.	Although the terms woodland and forest are often used interchangeably, the term woodland is commonly associated with forest types in drier climate regions (for example, pinyon-juniper woodlands) or is used to describe a forest with a more open canopy. For example, the Black Hills Community Inventory defines woodlands as open stands of trees with crowns not usually touching (generally forming 25 percent to 60 percent cover) (Marriott and Faber-Langendoen 2000a, Marriott et al. 1999). A footnote regarding this was added to the assessment.
Table 2 referenced on page 20 is missing.	Table 2 referenced on page 20 is now the Table 2b at the beginning of the assessment, page 3, titled "Table 2b. Trend of forest land by forest type on the Black Hills National Forest based on the Forest Inventory and Analysis (FIA) data (repeat measurements only)".
Table 4. What year is this FIA data from?	The custom Black Hills FIA database and associated version of FIA's Evalidator was used. This includes data collected from 2017 - 2019. This was clarified throughout the revised assessment.

Comment	Responses
It also must be stated that SS5 have been heavily impacted by logging. Late successional stands, both dense and open park-like, have recently been logged.	References to structural changes were updated to be habitat structural stages (HSS) throughout the document for consistency. No change regarding HSS5 was made. Changes to the amount of HSS5/late-successional stands have mainly been due mountain pine beetle impacts and fire. Recent vegetation projects on the forest have been focused on the 4A stands [the Black Hills Resilient Landscapes project (BHRL)] and the 4C stands [the Pine Beetle Response Project (PBR)]. The PBR project Final Environmental Impact Statement (FEIS) stated how there are currently stands within the project area (Forest) classified as late successional, Structural Stage 5 (HSS5). The action alternatives do not propose treating in HSS5. Tree mortality from mountain pine beetle may occur in structural stage 5. Small scale occurrence of insects may enhance the characteristics of late successional stands. (PBR FEIS, Chapter 3, Affected Environment, page 133.) The BHRL Record of Decision (ROD) states how, as described in the FEIS, there is a need to maintain existing late succession forest and allow additional late succession to develop. The selected alternative would retain old growth characteristics in all known late succession stands, work toward identification of unrecorded stands, and conduct activities to maintain or enhance stands that possess or are developing late succession characteristics. No activities changing structural stage would occur in HSS 5 stands. As described in design feature 3a, allowed activities in HSS 5 include broadcast prescribed fire, piling and burning fuels, and precommercial thin. These activities would not occur in late succession forest (SS 5) unless they would maintain or enhance late succession characteristics. (BHRL ROD, p.5)

Comment	Responses
Snags and downed wood are key elements of ecological integrity. Snag abundance may have decreased since Lentile et al. (2000).	Information in Lentile et al. (2000) was used as a reference in terms of snag abundance in unmanaged stands. Current snag abundance for the ponderosa pine forest type (both managed and unmanaged areas) is described in a later paragraph. See also table 13 in appendix A.
Page 20 cites a 2014 basal area. Surely that has changed in the last six years. What is it now? It is also citing higher density and smaller quadratic mean diameter, but we assume those figures have departed even further since 2014. Please update information.	This section was based on preliminary research results that have not been published yet but were discussed via personal communication with the study author. Data was collected in 2014 and has not been updated since then.
Needs for change. We generally agree with the need for change outlined for Ponderosa Pine ecosystems on page 22.	Thank you for your comment.
Need for change: Figure out how to track change in forest types more accurately (uncertainty, page 3).	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process.
Need for change: Install concrete directives in Goals and Standards for making uneven-aged timber stands and Rx burning a reality on this Forest.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process.
Need for change: might want to consider latitude and elevation when determining "desired future conditions."	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process.
Need for change: In stands that are already sparse (4A) facilitate survival of Ponderosa pine by creating conditions where mature trees can survive wildfire by conducting prescribed burns.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process.

Comment	Responses
Need for change: May want to stratify future desired conditions by latitude and elevation to accommodate climate change risks in a more fine-tuned approach.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process.
Need for change: Address loss of larger, older trees that make major contributions to ecological integrity. Place a moratorium on cutting trees larger than 14” DBH	Thank you for your comment. Diameter limits must be considered carefully to avoid arbitrary policies that may meet social objectives but limit the potential to achieve ecological objectives: "blanket policy of diameter-limit cutting impairs the ability of resource managers to achieve or maintain desired conditions and is not sustainable in the mid to long term." (Triepke et al. 2011) "We conclude that diameter caps may enhance some ecosystem components, such as densities of large trees, but they negatively impact many nontree components." (Abella et al. 2006)
Need for change: It may be necessary to delay harvest beyond the time of CMAI (Cumulative Mean Annual Increment) to allow stands to recover ecologically from recent disturbances in even- aged stands.	Thank you for your comment. Pre-CMAI harvest or delayed harvest following CMAI will primarily be dependent upon desired future conditions that will be evaluated during the development phase of forest plan revision. See revised Timber Assessment, Chapter 4 Key Inventory Trends, Age Classes, for a discussion regarding change to timberland area by age classes and the National Forest Management Act requirement for regeneration harvests to occur at or later than CMAI.
Need for change: Might need more than five structural stages.	Thank you for your comment. Revised assessment language was revised to mention this. See also the revised Timber Assessment, Chapter 5 The Need for Change, Structural Stage, Forest Planning Metrics. References to structural changes were updated to be habitat structural stages (HSS) throughout the document for consistency.

Comment	Responses
Need for change: Move toward larger trees in more complex arrangements. It is necessary to move beyond assessing risk of insect infestation and wildfire risk simply because of stand density and add in consideration of the qualities of surrounding areas, i.e., what is the density, slope, aspect, and surrounding species, etc.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process.
We agree with need for change listed on page 31. We note that Spruce areas currently have the highest ecological integrity on the forest and that would be difficult to "improve." Please see Norbeck Society Spruce project scoping comments for May 2021	Comments regarding the Spruce Vegetation Management Project will be assessed in conjunction with the analysis for that project.
Please see comments submitted on Pine and Aspen scoping comments from spring of 2022.	Comments regarding the Pine and Aspen Project will be assessed in conjunction with the analysis for that project.
How many FIA plots were inventoried and over what timeframe for the assessment.	The custom Black Hills FIA database and associated version of FIA's Evalidator was used. This includes data collected from 2017 - 2019. Details about this data can be found in RMRS-GTR-422 (see pages 20-21, Table 3). 438 FIA plots were measured in 2017-2019. Additional information was added to the assessment to clarify this.

Comment	Responses
The Forest Service should include a definition of "historic" and identify parameters as to how it is used.	Thank you for your comment. First, your comment highlighted the fact that the assessment should be using the term "historical" rather than "historic" and this was updated. Second, historical is used in a few different ways in the assessment. In some cases, it is meant to mean "of the past" in a general sense, such as "There has historically been a high demand for wood products from the forest". In most cases, it is in reference to and associated with the details of the literature cited. For instance, historical accounts such as Dodge (1876) and Graves (1899) describe expeditions and surveys done in 1875 and 1897-1898 respectively and are associated with the time before and during Euro-American settlement. Brown and Cook (2006) use 1900 as their point of reference. Tatina and Hanberry (2022) use General Land office (GLO) records from 1878-1915.
The citation from Walters (2013) only references inventory conducted in 2005 ("This inventory of the Black Hills National Forest covers the years 2007-2011 on the South Dakota portion of the forest and 2005 on the Wyoming portion"). The Forest Service should confirm whether or not there is more recent data that should be used.	An earlier version of this assessment looked at changes relative to Walters et al. (2013). At that time, as discussed in the draft assessment, additional FIA data had been requested to support a comparison that is representative of change since the signing of the 1997 forest plan and based on repeat measurements only. This data is now available and has been used instead of Walters et al. (2013). This new custom FIA analysis provides a forest-wide comparison of the area by forest type using Forest Inventory and Analysis (FIA) data that was made using: the 2000 periodic inventory for WY and the 2001-2005 annual inventory for South Dakota (Measurement 1); and the 2017-2019 forest-wide inventory (Measurement 2) for forestlands. The Measurement 1 inventory estimates for both South Dakota and Wyoming utilize data that precede the data used in Walters et al. (2013), lengthening the time over which the comparison is made. Comparisons were made using repeat measurements only since this approach is ideal for assessing change over time.

Comment	Responses
Mountain pine beetle (MPB) Citation, page 12 - the citation at the bottom states "Increases in MPB populations were first detected in 1996 (ADS). The highest year of MPB activity was 2003 based on acres affected..." It is unclear where these references come from, and the Forest Service should provide citations.	This is based on the aerial detection surveys done by Forest Health Protection. See the revised Timber Assessment, Chapter 3, Key Ecosystem Drivers and Stressors, Mountain Pine Beetles, and Table 17 in the appendix. A statement has been added to that assessment regarding the accuracy of the earlier forest health protection aerial detection surveys and the change in survey protocol in 2010. Upon consideration of a change in survey protocol and a review of mortality acres the discussion has been updated to indicate that MPB mortality peaked in 2013. A cross-reference to this section of the Timber Assessment was added to the Forested Ecosystems Assessment.
This document references erroneously states that "Larger diameter trees are susceptible to mountain pine beetle, but smaller trees are not". Our experiences in Crook County are that the MPBs prefer larger diameter trees, but still infested smaller ones. Thus, our suggestion is to state that "smaller trees are less susceptible." Crook County Natural Resource District (CCNRD) FIA will be happy to provide this supporting data.	Thank you for your comment and the assessment was revised as suggested.
The Forest Service states, "Current FIA data indicates an average of 5 tons/acre of coarse woody debris (3"+) in the ponderosa pine forest type." The "tons/acre of coarse woody debris" references appear overestimated throughout this entire document and especially if this information was solely derived from plots. The Forest Service should confirm if plots were used in to generate this data, how many were inventoried, with citation.	The query in Evalidator was double-checked. Comment was discussed with two fire and fuels specialists who indicated five tons/acre of coarse woody debris was reasonable or even low. Additional information was added to assessment regarding plot count. See also Photo Series For Quantifying Forest Residues in the Black Hills, Ponderosa Pine Type, Spruce Type. USDA Forest Service, Rocky Mountain Region. A-89-6-82.

Comment	Responses
Need for Change. Page 27. Bullet 4 - The Forest Service states that the "Focus on increased reforestation via planting, in particular in high-severity fire areas that are not regenerating due to lack of a seed source." We recommend utilizing native seed sources for the reforestations.	Thank you for your comment. It will likely be considered in the next phase of the forest plan revision effort - plan development. Any plan direction regarding this will be consistent with Forest Service policy and protocols.
The Crook County Natural Resource Management Plan (dated December 2,2020, Photo Book 617, page 208-209) includes the following: Priority #3 -- Forest management on public lands shall support coordinated timber harvesting and thinning to promote forest health, reduce disease and insect infestation, reduce wildfire impacts, and prevent waste of forest products while supporting the economy of Crook County for future generations. Priority #5 -- Federal agencies shall coordinate with Crook County on vegetative treatment, prescribed burn, or set-aside on public land. Priority #6 -- The County encourages active management of forest resources on public lands to reduce further invasion of mountain pine beetle. Priority #8 -- Federal agencies should support weed management and mitigation on forested federal lands within the County and support the creation of the Play, Clean, Go program.	Although the Crook County Natural Resource Management Plan will be an important document for the Black Hills to consider as we approach plan revision, no direct updates to the vegetation assessment are needed at this time as directly related to the four priorities identified in this letter. For example, aspects from priority #3 could be considered as we develop goals and desired conditions with the revised forest plan that speak to forest health and economic viability of neighboring counties. Aspects of priority #5 could be considered as a management approach with the revised forest plan as management approaches often are used to describe local coordination efforts with national forest management objectives. Priority #6 will likely be addressed through forest plan standards, guidelines, and objectives for forest health and pest control. Priority #8 will likely be addressed through standards, guidelines, or objectives specific to invasive weed management in the revised forest plan. The forthcoming National Environmental Policy Act (NEPA) process for plan revision is subject to multiple layers of public involvement that will further shape these issues and how they may be addressed in the forest plan. The current assessment phase does not consider future plan components that may be more responsive to these comments.

Comment	Responses
Several research studies have shown the effectiveness of fire and fuel treatments to increase tree resistance to bark beetles. Consider these (Hood et al. 2016; Fettig et al. 2021).	Additional sentence added to the assessment: Fire and fuels treatments can be effective at increasing tree resistance to bark beetles, but this effect can vary depending on the treatment (Hood et al. 2016, Fettig et al. 2021). See also the revised Timber Assessment, Chapter 5 The Need for Change, Silvicultural Practices, Uneven-Aged Management, Fuels Reduction discussion.
The assessment states that the ecological integrity of the ponderosa pine ecosystem is low and will likely to be so in the future. Rocky Mountain Elk Foundation (RMEF) supports the need for change with a focus on a more heterogeneous forest structure, restoring more frequent fire, increased reforestation, and sustaining the existing late successional stage, all with an adaptive management framework given changing conditions and new information.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process.
With aspen predicted to continue declining, RMEF supports the Need for change with a focus on restoring prescribed fire treatments for aspen stands, excluding herbivores in clones that are impaired or in decline, and revisiting current classification objectives.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process.
Rocky mountain juniper has increased extensively across the area including the Black Hills. Expansion of juniper can alternative grasslands by changing soil characteristics, limiting herbaceous biomass, hindering regeneration of native grassland species, and reducing rangeland forage production (see Rangeland Ecology & Management, Vol, 70. Issue 1: Woody invasion of western rangelands: Using grouse as focal species for ecosystem restoration). RMEF recommends plan components to control and reduce expansion of juniper into these systems.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process.

Comment	Responses
The need for change sections for each ecosystem should be removed from this assessment. This section is encouraging a management action and providing a recommendation for the direction of the new forest plan, which is a violation of the 2012 Planning Rule, and not appropriate for the assessment phase of the Forest Plan revision.	Including a potential need for change section in the assessment is not in violation of the 2012 planning rule. This section was included in the draft assessments to be more transparent with the public, explaining the potential relationship among the existing conditions, the current plan, and potential future plan components. One purpose of the assessments is to provide information to identify the need to change the plan (FSH 1909.12, Chapter 10). Assessments are not decision documents. Potential changes to the forest plan and effects will be identified and evaluated during the development phase of forest plan revision.
Desire to see data, or a source cited for this statement found on page 19, 2nd paragraph under the Regeneration heading: "While plentiful, ponderosa pine natural regeneration is variable across the forest. Density of natural regeneration varies by site productivity, seed source abundance, and competing vegetation." What does the regeneration of ponderosa pine in the Black Hills look like, 100 TPA? 1,000 TPA, 10,000 TPA? What are the desired stocking levels? Where in the forest are the 11,000 acres of certified lands? Where in the forest is regeneration the densest/the least dense/average? A map showing regeneration density would be beneficial for this assessment.	As described in the assessment, FIA seedling data (less than 1" DBH) indicate that in the ponderosa pine forest type, there is an average of more than 1,400 seedlings per acre, with about half (52%) of those being ponderosa pine seedlings and the rest being seedlings of other species. When broken out by site index, this varied across site index classes, from 375 seedlings/acre to 2,200 seedlings/acre. This information was added to the assessment in an earlier section. Regeneration is measured from field survey or walk-through survey on forested lands. Stands stocked with a minimum of 150 trees per acre are certified as regenerated (Forest Plan standard 2416b). Forest regeneration needs and the certification of stands that meet minimum stocking standards are tracked annually in the FACTS database (Forest Activity Tracking System). Spatially, regeneration is tied to site index and soils. For example, the Northern Hills has higher site productivity and natural regeneration levels than the southern portion of Hell Canyon. Regeneration is variable from the 100s to 1000s per acre. Tabular FIA data and Spatial layers have information about site productivity and soils that could be used during future phases of plan revision. This information was added via a footnote to the assessment.

Comment	Responses
What does the planting program in the Jasper fire area consist of? How many trees per acre are being planted? Is there an establishment inventory being conducted 2 -5 years post planting to accurately assess survival of planted seedlings? What are the species being planted? What areas of the Jasper fire are being targeted for planting and why?	Thank you for your questions. Some information has been added to the revised assessment to better describe these conditions. An average of 430 acres per year have been planted with ponderosa pine trees in the Jasper burn area since 2003. Generally, areas are targeted based on the pre-burn conditions, forest plan management area direction, and logistics/access. Typically, 400 trees per acre of ponderosa pine are planted, with a target of 250-300 surviving seedlings. There is a requirement to monitor seedling survival rates through first- and third-year surveys. The objective of these surveys is to assess the quality of nursery stock and identify causes of undesirable survival rates so that needed adjustments can be implemented. Survey results and interpretation are reported to the Forest Service Regional Office annually.
Understory and Variation in Understory – Desire to see more data provided; maps, tables or figures showing the relationship between basal area (BA) and forage production. How much forage is available under various basal areas? How has that changed over time since the last Forest Plan? What parts of the forest have low/moderate/high understory/forage levels? What is the current estimate of understory abundance today? What species are present? What species are declining?	Limited information is available regarding how forage has changed, its distribution across the forest, current abundance, and species present. However additional information on this topic was summarized from Shepperd and Battaglia (2002) and was added to that assessment section.

Comment	Responses
Bullet point one for Ponderosa Pine: "This will continue as fire becomes more widespread as a result of climate change. Fires, particularly mixed-severity fires with large areas of high-severity, such as the Jasper fire, will likely occur more frequently….". Climate change is not the only driver of this, putting out the fires that do occur as fast as possible is also a major driver of this issue. We suggest that you acknowledge that the current fire policy is a driver for this increased risk of large high-severity fires.	As discussed in the Fire and Fuels Assessment, fire exclusion has led to uncharacteristically heavier surface fuel loads and denser understories of young ponderosa pine, which can lead to more severe fire potentially damaging soils and killing overstories. As discussed in the need for change section of that document, reasonable guidance regarding natural fire needs to be considered. Text regarding this was added to the forested ecosystem assessment as suggested.
Cyclic mountain pine beetle epidemics is identified as a factor necessary for high ecological integrity and then in bullet point two is used to justify the current rating of low ecological integrity. This seems contradictory.	Both the description of high ecological integrity and bullet point two have been edited to better respond to this public comment.
Bullet point three, last sentence "This change in forest structure has likely also led to a loss in the diversity and biomass of understory species." A citation is needed, data are needed. This statement in its current form is based on assumptions.	Thank you for your comment. This statement has been removed from the revised assessment.
"One way to increase the ecological integrity…." (Page 22) This is a leading statement encouraging a management action and providing a recommendation for the direction of the new forest plan, which is a violation of the 2012 Planning Rule, and not appropriate for the assessment phase of the Forest Plan revision.	Thank you for your comment. This statement has been removed from the revised assessment.

Comment	Responses
White spruce – The data presented in Figure 4 and 5 raises concerns, such as: There are no spruce between the ages of 11 and 40 years of age in the entirety of the Black Hills; Looking at the South Dakota Forest Action Plan, published in 2020, page 7 of the Resource Assessment, Table 1.2 Area of Coniferous Forest Type by Tree Age Class present data FIA data for white spruce that is significantly different than what was presented in this Forest Service Assessment.	Data referenced was based on older FIA data, with a different area basis, and used wider age classes.
"Very little area is in the youngest age classes. This is consistent with observations by Peter Brown that it is difficult to locate older white spruce and most individuals are less than 150 years old and many established since fire exclusion began (Murphy et al. 2017)" – Page 28. This statement is confusing, and it is not clear how the 2nd sentence relates to the 1st. How is it that the lack of trees over 150 years old are influencing white spruce regeneration?	This was clarified in the revised assessment.
There is not enough information provided to explain the lack of the youngest age classes considering the amount of spruce 61 to 100 years old, and the fact that "White spruce seedlings can be found underneath existing canopies. It is the most shade tolerant of the Black Hills tree species, enabling growth and survival under closed forest canopies." (Page 26). We would surmise that the FIA data is lacking and not appropriate to be used solely to accurately assess white spruce in the Black Hills. There is a data gap that needs to be addressed.	If white spruce seedlings are underneath an existing canopy, the dominant age class would likely be that of the existing canopy, not the seedlings. See also Figure 4 which indicates that stocking levels in the 1 to 5 inches diameter class indicate that spruce stands are generally well stocked with young spruce trees. Text was added to the assessment regarding the lower number of plots in forest types such as white spruce and the tie to higher sampling errors and less precise estimates. The 2012 Planning Rule and associated handbook direction (FSH 1909.12, Chapter 10, section 11) describes how one of the assessment's purposes is to rapidly identify and evaluate existing, available, and relevant information and makes it clear that if no available information exists, there is no requirement to begin new studies to acquire or develop such information.

Comment	Responses
How can white spruce be expanding in the Black Hills from 51,600 acres reported in Walters et al (2013) to current estimates of 54,282 acres if there is very little regeneration and no trees between the ages of 11 and 40?	Thank you for your comment. Analysis regarding recent trends in area by forest type was updated to use repeated measurements only, as described in Chapter 1 of the assessment. The latest analysis using FIA data show a slight decrease in recent years. However, when considering a longer time frame, white spruce has expanded relative to historical estimates from the late 1800s as described in the assessment.
According to the Ecological Integrity of Forest Ecosystems Assessment (pg. 11), there is general uncertainty about precipitation, although there may be an increase in winter/spring precipitation, there may be increased variation in future precipitation, there may be drier conditions, and there may be warmer winter temperatures. There are no citations for any of that.	The beginning of this section states that information about the vulnerability of ponderosa pine to climate change was taken directly from Timberlake et al. 2022. Timberlake, T.J.; Halofsky, J.E.; Joyce, L.A.; Peterson, D.L. 2022. Climate change vulnerability in the Black Hills National Forest. U.S. Department of Agriculture, Forest Service, Western Wildland Environmental Threat Assessment Center. Unpublished report.
We recommend the assessment identify the Natural Range of Variability (NRV) through readily available information, such as, Colonel Dodge, Henry Graves, and Hopkins' observations. These observations describe the NRV as showing signs of large areas of mortality due to insects and fire, large areas of small trees, and areas of larger, open grown pine stands.	The discussion surrounding NRV has been expanded. A sentence was added regarding the past peak in standing inventory. See also discussion regarding standing inventory in the timber assessment. Alternatives for desired conditions, corresponding management scenarios and corresponding inventory levels will be prepared and assessed during the development phase of forest plan revision.

Comment	Responses
We question the choice to compare the 2005-2011 period to the 2017-2019 period for conclusions about vegetative trends. This selection fails to capture how the forest has changed over a rotation and we recommend including the pre-settlement time period in the comparison. This will help describe the NRV.	Thank you for your comment. The discussion surrounding NRV has been expanded in the revised assessment. Recent trend information was revised and updated, as described in Chapter 1 of this assessment. As described in handbook direction (1909.12, Chapter 10, section 12.1), assessing ecological integrity involves both describing the natural range of variation for selected key ecosystem characteristics or a suitable alternative to establish a context for whether ecosystems are functioning properly as well as assessing and documenting the projected status of the ecosystem based on projected trends of key ecosystem characteristics after considering the current plan and influence of climate change. Recent trends were used to infer likely future trends. This scope of this assessment, beyond describing the natural range of variation, was specifically changes to forest vegetation condition that have occurred during implementation of the 1997 forest plan.

Comment	Responses
The assessment has pre-decisional and bias statements towards the need to switch to uneven-aged management and against even-aged management. For example: a. Page 5 states, "Even-aged silvicultural systems in ponderosa pine forest result in ecological conditions with lower structural and spatial heterogeneity and reduced resilience to native ecological disturbances such as mountain pine beetle epidemics and wildfire, and consequently, lower ecological integrity." No reference cited. There are many more details to discuss how even aged and uneven aged stands may contribute to ecological integrity, such as stand density, spatial scale, and ability to manage the regeneration that did not get adequate discussion in the assessment. Page 9 states, "Other factors that may affect the shift from endemic to epidemic populations of mountain pine beetle include other stand structure attributes (such as being even-aged and single-storied), climatic conditions and proximity to existing beetle populations (Gibson et al. 2009)." The actual text from Gibson et al. 2009 is as follows (text that was omitted from the assessment is in italics): "Other factors that may affect the shift from endemic to epidemic populations of mountain pine beetle include other stand structure attributes [such as being densely stocked (i.e., for average stand diameter of 10-12 inches, >150 square feet basal area per acre), have an average diameter > 10 inches, and are even-aged and single storied], climatic conditions, and proximity to existing beetle populations."	Thank you for your comment. Additional language was added to describe how a management regime that includes both uneven-aged and even-aged management could potentially best mimic historical stand and landscape structure. Text from Gibson et al. 2009 was edited to match that reference. See also the expanded discussion of uneven-aged management in the revised Timber Assessment, Chapter 5 The Need for Change, Silvicultural Practices.

Comment	Responses
Page 4 states, "Supporting wildlife through habitat is another key ecosystem service of the ponderosa pine forests of the Black Hills. As described in USDA Forest Service (2005), ponderosa pine forests in the Black Hills are highly variable and as such provide for a variety of wildlife species." These statements appear to contradict other statements in this and the timber assessment that the Black Hills National Forest is too uniform due to the even-age management emphasis.	Thank you for your comment. Assessment text was revised.
This assessment should include relevant information regarding silvicultural systems from the Phase II amendment, such as, "Even-aged silviculture is eminently suited to Black Hills ponderosa pine (Boldt et al. 1983). The shelterwood method capitalizes on the species' natural tendency to form even-aged stands..."	Thank you for your comment. Some information from the Phase II Amendment analysis was added to the revised assessment to better explain silvicultural systems.
Page 5 states, "The only other commercial timber species on the forest is white spruce, with very little to no volume of this species currently sold." It would be more appropriate to discuss it as minor contributor to the timber sale program and describe how the Black Hills National Forest has currently initiated a NEPA project to treat a significant amount of white spruce.	Text was edited to state that white spruce is a minor contributor to the timber sale program. However, no mention of the initiated NEPA project was made given it is still under analysis at the time the revised assessment was drafted.
Page 9 makes references to Allen et al. 2020 on numerous occasions. We have been unable to find this publication and would appreciate a copy sent to us.	Publication passed on to requestor.

Comment	Responses
Both Table 2 and Table 5 attempt to show changes in acres of Ponderosa Pine stands but report two different sets of acreages from two different sets of data from two different sets of years of comparison. We recommend the assessment better describe the information sources or these two documents or stick with one source of data for both tables to avoid confusion of the public.	While we agree that in some cases multiple data sources indicating different things can be confusing, it was necessary in some cases. Chapter 1 outlines the key data sources and describes how the FSVEG spatial vegetation layer was used in some situations. Structural stage is not a direct output of FIA but is available in the FSVEG spatial vegetation layer. Presenting multiple sources of data also helps ensure that the assessment is not biased in a particular direction and/or leaving relevant information out.
Page 14 compares FIA data estimates of the acres of Ponderosa Pine x size class to a study from Walters et al. 2013. However, the assessment does not include the figure (figure 3) that is referenced from Walters et al. 2013. We recommend including this figure for comparison.	Analysis about recent trends was updated to use repeated measurements only, as described in Chapter 1 of the assessment. This replaced earlier comparisons made with Walters et al. 2013.
Page 20 describes "Preliminary research results comparing Black Hills Forest structure in 2014 to historical forest structure (M. Battaglia, personal communication)". It is inappropriate to include preliminary, unpublished, non-peer reviewed information that has been relayed through "personal communication" and has not been made available to the public.	The Preamble of the planning rule states a range of information that can be considered to be the best available scientific information (BASI): "In some circumstances, the BASI would be that which is developed using the scientific method, which includes clearly stated questions, well-designed investigations and logically analyzed results, documented clearly, and subjected to peer review. However, in other circumstances the BASI for the matter under consideration may be information from analyses of data obtained from a local area, or studies to address a specific question in one area. In other circumstances, the BASI also could be the result of expert opinion, panel consensus, or observations, as long as the responsible official has a reasonable basis for relying on that scientific information as the best available." [77 FR 21192 (April 9, 2012)]

Comment	Responses
Page 6, in an attempt to describe the effects of timber harvest and fire exclusion, fails to utilize the BASI. We recommend utilizing post MPB epidemic data to describe the current conditions.	It is unclear what exactly the commentor would like changed. FIA data collected from 2017-2019 is used throughout the assessment, along with other data, scientific publications, and information to describe the current conditions. The 2012 Planning Rule and associated handbook direction (FSH 1909.12, Chapter 10, section 11) describes how one of the assessment's purposes is to rapidly identify and evaluate existing, available, and relevant information and makes it clear that if no available information exists, there is no requirement to begin new studies to acquire or develop such information. The 2017-2019 FIA inventory and the November 3, 2021, FSVeg layer utilized in the assessment represented the most current and complete inventories available for the assessment at the time. These inventories are also post-MPB epidemic. Additional inventory efforts, including the acquisition of LiDAR data at the appropriate quality level are expected to inform the forest plan revision process during future phases.
Page 21-Summary of Ecological Integrity, Ponderosa pine: We recommend that the description of what an ecosystem would be like if it had high ecological integrity should describe if the is based on the NRV or an alternative approach as per the FSH 1909.12, Section 12.14 a.	Bullet points in this section indicate the rationale behind the rating for each ecosystem, as supported by earlier sections of the assessment.
Page 21-Summary of Ecological Integrity, Ponderosa pine: e. First bullet point (last sentence on Page 21) may be true over a short-term view but fails to properly compare to the NRV. It will be imperative as we enter plan revision to have a non-biased assessment as to what has happened to forest densities and structure over the past hundred years through lack of management and fire suppression that has led to the recent decline in acres.	While we recognize that historical conditions on the Black Hills contained both nonforested areas and openings, the scale of the issue, if high-severity fire becomes more widespread is not necessarily similar to NRV. This bullet point was clarified.

Comment	Responses
Page 21-Summary of Ecological Integrity, Ponderosa pine f. The fourth bullet point seems to contradict the narrative that the entire assessment is trying to push. Throughout the assessment it is described how the likelihood of high severity fires is increasing due to the loss of heterogeneity along with loss of ecological integrity, however, it is stated in this bullet point that "converted more than 150,000 acres of moderately closed and closed stands to non-stocked areas and open stand conditions."	Thank you for your comment. Timber management and other factors have converted a large number of acres to open stand conditions. However, the even-aged management that is typically practiced leads to a less complex structure and less heterogeneity than what would be present otherwise. Increasing heterogeneity and structure in the now more open forest will require long-term forest management.
Page 21-Summary of Ecological Integrity, Ponderosa pine: g. Last sentence needs to be removed as it is pre-decisional and biased towards uneven aged management.	Thank you for your comment this sentence was deleted in the revised assessment. Plan development will consider the variety of resources, uses, and ecosystem services on the Forest. As stated in the Planning Rule (36 CFR 219.1(c)), "Plans will guide management of National Forest System lands so that they are ecologically sustainable and contribute to social and economic sustainability; consist of ecosystems and watersheds with ecological integrity and diverse plant and animal communities; and have the capacity to provide people and communities with ecosystem services and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future."
Page 22-Need for Change: a. First bullet needs to be removed due to it being pre-decisional and bias towards uneven-aged management.	Additional language was added to the assessment to describe how a management regime that includes both uneven-aged and even-aged management could potentially best mimic historical stand and landscape structure. See also the expanded discussion of uneven-aged management in the revised Timber Assessment, Chapter 5 The Need for Change, Silvicultural Practices.

Comment	Responses
Page 22-Need for Change: b. Second bullet needs to be revised to stating the need to further assess the ability to restore more frequent surface fire across the ponderosa pine ecosystem and how future trends of mechanical treatment may impact it.	Sentence added to reflect this: While it varies across the Forest and situation, in some cases, mechanical timber harvest or hand thinning may make implementing prescribed fire easier and lead to less overstory mortality.
Page 22-Need for Change: c. We recommend the inclusion of the need to review and identify Desired Forest Conditions (DFCs) for the various Management Areas and for the Forest as whole in enough detail that management strategies can be developed to achieve those DFCs.	Thank you for your comment, but we do not see a need to update assessment identifying desired conditions. Desired future conditions will be developed and made available for public comment as part of the plan development stage.
White Spruce-The assessment describes how white spruce has expanded its range and currently occupies 54,282 acres. We recommend the assessment look at where spatially white spruce has been expanding. If it is outside its historical niche of cool moist sites due to fire exclusion, then its future risk needs to be better described given climate change and the stated needs to return surface fires to the landscape.	We feel the assessment, particularly the summary of ecological integrity for white spruce, with its distinction between pure spruce areas and mixed-conifer areas, sufficiently addresses this.
Summary of the Assessment of Ecosystem Integrity of Forested Ecosystems: This section needs to be redone as it again contains pre-decisional, biased, and unsupported statements. For example: Second bullet point states that MPB epidemics will occur multiple times during a forest rotation but does not describe how reduced stocking can help reduce the susceptibility as found by Negron et al. 2017.	This bullet was edited. Discussion regarding how thinning reduced susceptibility to mountain pine beetle was also added to an earlier section.

Comment	Responses
Summary of the Assessment of Ecosystem Integrity of Forested Ecosystems: This section needs to be redone as it again contains pre-decisional, biased, and unsupported statements. For example: Fourth bullet point lumps timber management into the reasoning for the decline of late-successional habitat. A deeper analysis is needed properly assess the risks to these habitats and how timber harvesting can be utilized to increase the resiliency of these habitats.	Thank you for your comment. In this bullet point, in the first sentence, the decline in late-successional habitat is stated to have resulted from mountain pine beetle and fire. Timber harvest is not mentioned. In the second sentence - "Additionally, timber management, mountain pine beetle activity, fire, tornados, or a combination of these have converted more than 150,000 acres of moderately closed and closed stands to non-stocked areas and open stand conditions." - timber harvest is included because it has converted moderately closed and closed stands to open stand conditions because areas that are mature (HSS4) but not late-successional (HSS5) are harvested. See also previous response with specific references to PBR and BHRL projects.
Yet for the Black Hills revision process the US Forest Service has already prepared hundreds of pages of draft Forest Assessments before the agency has even issued a public scoping notice for the Revised Plan. Basically, the agency decided on its own, without any public input, what issues will and will not be addressed in the assessments that will be used as the foundations for the Revised Forest Plan and its programmatic Environmental Impact Statement.	No need to modify assessment or the assessment process. The Planning Rule now requires plan revisions to conduct assessments prior to public scoping normally associated with the NEPA process. The agency provided a Notice of Intent to start the assessment process and provided an opportunity for public review and comment. Assessments will be used to inform the existing condition during the plan development and NEPA phase, but certainly do not represent the last opportunity for the public to engage on all sources of information that can be useful during the revision process.

Comment	Responses
The DFA for Forest Ecological Integrity never mentions the terms "fragmentation" or "interior forest." Because fragmentation and loss of interior forest habitat are highly relevant to ecological integrity, please include a full assessment of forest fragmentation, patch size, and available closed canopy interior forest in the final DFA.	Following handbook direction (FSH 1909.12, Chapter 10, section 12.13), the assessment is focused on what was considered to be key ecosystem characteristics. Handbook direction indicates this should be a manageable set of ecosystem characteristics and at the appropriate scale. The 2012 Planning Rule (36 CFR 219.6) describes how the Responsible Official has the discretion to determine the scope and scale of an assessment. Handbook direction (FSH 1909.12, Chapter 10, section 10.4) states that it is the responsibility of the Responsible Official to supervise the assessment process so that the assessment is an analysis and synthesis of the most important relevant information. The scope of the assessment was limited to major stressors and drivers. No change made to assessment. These attributes may be assessed in conjunction with management scenarios during the development and analysis phases of forest plan revision.
"Have an emphasis on sustaining the existing late successional habitat and take actions to develop late successional habitat over time." I commend the agency for including this statement. Unfortunately, the DFA does not contain any real assessment of old growth / late successional habitat on the Forest.	Assessment has a section devoted the structural stage distribution and late-successional forest. It discusses current plan direction relevant to late-successional forest. Additional information was added regarding average stand size, slopes, spatial distribution, and distance from roads and trails.
It is my understanding that the US Forest Service has designated some of the remaining SS4C stands that are mature and closed-canopy to serve as potential future old growth. The same questions should be answered for these stands.	There is no official inventory that designates potential old growth on the Forest. Potential old growth is identified at the project-level at the prescription development phase. There was discussion in the BHRL ROD stating that HSS4C stands are good candidates for future HSS5 and that there would be some movement of stands into HSS5 from HSS4C as stands develop old growth characteristics. Additional information about the HSS4C stands was added regarding average stand size, slopes, spatial distribution, and distance from roads and trails.

Comment	Responses
The original Forest Plan and the first revised Plan directed the agency to maintain 5% SS5 habitat on the Forest. However, Table 5 on page 17 of this DFA indicates only 0.6% of the forested stands remain in SS5 condition. It also indicates there has been a reduction of over 16,000 acres of SS5 habitat since 1995. What are the reasons for this significant loss of SS5 habitat?	Thank you for your comment. As stated in the assessment, late-successional stands (HSS5) have been heavily impacted by mountain pine beetle mortality and fire.
The following statement on page 22 of the DFA is troubling and needs to be reconsidered: "Focus on a desired forest structure in ponderosa pine that is more uneven-aged and spatially heterogeneous as was found historically." This is contrary to information and photographs in the Henry Graves report which indicate the Black Hills contained large patches of relatively even-aged ponderosa pine in an old growth condition before Anglo settlement began.	Additional information from historical accounts, such as Graves (1899) and Dodge (1876) have been added to the assessment. Assessment has clarified that given the mixed-severity fire regime (including both more frequent, lower-intensity surface fires and less frequent, high-intensity crown fires) that occurred in the Black Hills, a management regime that includes both uneven-aged and even-aged management could potentially best mimic historical stand and landscape structure.

Comment	Responses
Changing Structural Stage Objectives. I am troubled by the following language on ponderosa pine structural stages found on page 22 under the heading "Need for Change": "Revisit the current structural stage classification system, which is most applicable for even-aged, single species stands rather than uneven-aged and mixed-species stands and is rather subjective. Future classification system should be appropriately tied to desired conditions for species habitat requirements. Revisit how structural stages are included in the plan in a way that is flexible and enables adaptive management given changing conditions and new information." It is now well known that the structural stage requirements of the existing RFP are limiting logging because the Black Hills National Forest has largely been depleted of SS5, SS4C and SS4B.	Clarified this bullet point in assessment to indicate the potential need for a more informative structural stage system with additional classes. Any direction related to the structural stages will be considered as part of plan development, analyzed as to its effects on a variety of resources, and will incorporate public comments received. See also the discussion in the revised Timber Assessment, Chapter 5 The Need for Change, Structural Stage.
Relaxing the SS objectives will not ensure forest ecological integrity; it would compromise ecological integrity across the forest. I am urging the agency not to cave in to timber industry pressure. Please leave the structural stage classifications and objectives alone.	Thank you for your comment, but there is no need to change the assessment in this regard. We look forward to engaging the public on objectives and other plan components for plan development during the NEPA process. Although assessments may evaluate current plan components, the plan revision stage will more thoroughly evaluate the effects of different plan components on a variety of resources.
We recommend the assessment identify the NRV through readily available information, such as that found in the previous 2006 Plan amendments and 1997 Plan revision.	The discussion surrounding NRV has been expanded, with more focus on historical accounts (Graves (1899), Dodge (1876)) and other research (Shinneman and Baker 1997, Tatina and Hanberry 2022).

Comment	Responses
The assessment should better describe how the Black Hills National Forest was at the highest standing inventory of ponderosa pine in history around the time of the 1997 Forest Plan Revision and how that Revision reduced the Allowable Sale Quantity and therefore number of acres treated annually.	Thank you for your comment. A sentence was added regarding the past peak in standing inventory. See also discussion regarding standing inventory in the timber assessment. Both the revised Forested Ecosystems Assessment and the Timber Assessment acknowledge the high standing inventory level in 1997 and how different forest conditions are linked to mountain pine beetle susceptibility and wildfire hazard. Future parts of the plan revision process, including plan development and analysis of alternatives, will consider standing inventory levels and disturbance susceptibility in conjunction with a range of multiple use objectives.
We recommend that you update the Natural Range of Variability analysis to include more details about pre-settlement stand conditions, structural stage distribution, age class diversity, etc. While we do not support managing the Forest to replicate those conditions, we believe those details will provide a helpful reference.	Thank you for your comment. The discussion surrounding NRV has been expanded.
We recommend deleting the discussion suggesting that the Black Hills National Forest has already made a decision to implement an uneven-aged management strategy. That is premature and inappropriate.	Assessments are not decision documents. Comments regarding the level of uneven-aged management are intended to highlight key aspects of forest management practices that are priorities for evaluation during the development phase of forest plan revision. Assessment has clarified that given the mixed-severity fire regime (including both more frequent, lower-intensity surface fires and less frequent, high-intensity crown fires) that occurred in the Black Hills, a management regime that includes both uneven-aged and even-aged management could potentially best mimic historical stand and landscape structure. Plan development will consider the variety of resources, uses, and ecosystem services on the Forest. We look forward to engaging the public on plan direction during the NEPA process.

Comment	Responses
We do not agree with managing the Black Hills National Forest such that mountain pine beetle epidemics occur every 20 years for any reason. See our comments on Insects and Disease.	Mountain pine beetles are a natural component of the ecosystem and have an important ecological role. Text regarding this was edited to focus on low severity mountain pine beetle events.
The Assessment uses the 2005-2011 period to the 2017-2019 period for their conclusions about vegetative trends. That approach is completely unsupportable. A much longer view would be much more appropriate. For example, the US Forest Service Pacific Southwest Region uses the period 1500-1850 as the historical reference period for NRV Assessments for Forest Planning. There is a plethora of information available for the pre-settlement and early-settlement period in the Black Hills, and that information would go a long way toward a description of the Black Hills National Forest NRV.	Thank you for your comment. The discussion surrounding NRV has been expanded. Recent trend information was revised. As described in handbook direction (1909.12, Chapter 10, section 12.1), assessing ecological integrity involves both describing the natural range of variation for selected key ecosystem characteristics or a suitable alternative to establish a context for whether ecosystems are functioning properly as well as assessing and documenting the projected status of the ecosystem based on projected trends of key ecosystem characteristics after considering the current plan and influence of climate change. This scope of this assessment of ecological integrity involves both describing the natural range of variation to establish a context for whether ecosystems are functioning properly as well as assessing current conditions and recent trends in each ecosystem, specifically changes to forest vegetation condition that have occurred during implementation of the 1997 forest plan. Recent trends were used to infer likely future trends. Clarification was made regarding this in the assessment.

Comment	Responses
The last paragraph on page 4 states "The extent of ponderosa pine is declining (table 2)." Table 2 is based on the period from 2005-2011 to the period from 2017-2019. The Black Hills National Forest has much earlier forest inventory information and should use that to show a more complete picture of the Black Hills National Forest NRV. Keep in mind the overwhelming success of forest management and the trends in Black Hills National Forest inventory since 1897 as depicted in Table 3-8a in the Phase II Amendment FEIS. Granted, standing inventory is not a complete depiction of the Forest, it is a helpful perspective and should be included and discussed in the assessment, instead of simply basing conclusions on data from the last 20 years, or so.	Table 3-8a in the Phase II Amendment FEIS shows timber inventory and harvest. It does not show acreage of ponderosa pine on the Forest, for comparison with Table 2. This scope of this assessment of ecological integrity involves both describing the natural range of variation to establish a context for whether ecosystems are functioning properly as well as assessing current conditions and recent trends in each ecosystem, specifically changes to forest vegetation condition that have occurred during implementation of the 1997 forest plan. No change made.
The discussion about even-aged vs. uneven-aged management in the 3rd and 4th paragraphs on page 5 is completely inappropriate for this Assessment. There are pros and cons to both even-aged management and uneven-aged management, and those could be the basis for forest management alternatives for the revised forest plan. At written, however, they are simply somebody's personal opinion with no supporting references.	Assessment has clarified that given the mixed-severity fire regime (including both more frequent, lower-intensity surface fires and less frequent, high-intensity crown fires) that occurred in the Black Hills, a management regime that includes both uneven-aged and even-aged management could potentially best mimic historical stand and landscape structure. Plan development will consider the variety of resources, uses, and ecosystem services on the Forest. We look forward to engaging the public on plan direction during the NEPA process.
The graph on page 8 should be updated to the Ball/Allen version.	Unsure what the Ball/Allen version is. Did add cross-reference to Figure 31 in Graham et al. 2016, which is a similar figure (but not exactly the same) as that presented in Graham et al. 2021.

Comment	Responses
The sentence about stand structure attributes in the first paragraph on page 9 should be edited to include the full description from Gibson 2009 as follows (text that was omitted from the Assessment is in italics): "Other factors that may affect the shift from endemic to epidemic populations of mountain pine beetle include other stand structure attributes (such as being densely stocked (i.e., for average stand diameter of 10-12 inches, >150 square feet basal area per acre), have an average diameter > 10 inches, and are even-aged and single storied), climatic conditions and proximity to existing beetle populations."	Thank you for your comment. Text from Gibson et al. 2009 was edited to match that reference.
It is confusing that Table 2 shows most recent acreage of ponderosa pine of 789,803 acres with a decrease of 91,597 acres since 2005-2011, while Table 5 shows most recent acreage of ponderosa pine of 1,028,675 acres, with a decrease of 12,808 acres, since 1995.	While we agree that in some cases multiple data sources indicating different things can be confusing, it was necessary in some cases. Chapter 1 outlines the key data sources and describes how the FSVEG spatial vegetation layer was used in some situations. Structural stage is not a direct output of FIA but is available in the FSVEG spatial vegetation layer. Presenting multiple sources of data also helps ensure that the assessment is not biased in a particular direction and/or leaving relevant information out. While two different sets of data will never be in complete agreement and there are surely classification differences between the two data sets, the FSVEG spatial data in Table 5 does not separate out nonstocked the same way that FIA does (Table 2). Nonstocked areas in FSVEG Spatial are not a separate forest type, but rather get classified as HSS 1. A substantial increase in HSS 1 is seen in Table 5. Additionally, the FIA inventory classifies a higher amount as non-commercial (hardwood) forest relative to FSVEG.

Comment	Responses
It would be helpful if the assessment described in more detail what the Black Hills National Forest ecosystem would be like if it had high ecological integrity using the format at the top of page 16.	The top of page 16 has a table with the current structural stage objectives. Any direction and changes related to the structural stages will be considered as part of plan development, analyzed as to its effects on a variety of resources, and will incorporate public comments received. Your comment will be considered in the next phase of this effort – plan development.
The Black Hills National Forest should be doing a much more detailed investigation of NRV, going back much earlier than 1900, and making that information available. Again, other national forests have done that as part of forest planning. There is nothing in this assessment to support the notion that mountain pine beetle epidemics were historically the norm in the Black Hills; to the contrary, the description of stand conditions in the 5th paragraph on page 20 would lead one to expect that mountain pine beetle epidemics were the exception, and not the norm.	Mountain pine beetles are a natural component of the ecosystem and have an important ecological role, as described in the Insects and Disease - Mountain Pine Beetle section. Additional information was added to the assessment to address this.
The process to determine the degree of Ecological Integrity, i.e., High, Medium, or Low, needs to be transparent. How, for instance, did the Black Hills National Forest determine that Ponderosa Pine ecosystems need to experience frequent low to mixed-severity fires and cyclic mountain pine beetle epidemics in order to be considered high ecological integrity (see p 20, paragraph 7)? Likewise, how did the Black Hills National Forest determine that the current ecological integrity of the Ponderosa Pine ecosystem is low? The FS needs to "show their math."	The description of high ecological integrity is based on the natural range of variation, ecosystem drivers, and key ecosystem characteristics described previously. Fire and insects such as mountain pine beetle are dominant drivers and a natural part of this ecosystem. The reasons for the rating of low are described in the bullet points that come immediately afterward.

Comment	Responses
Considering the desired condition for the Black Hills National Forest described in the second paragraph, the Black Hills National Forest has generally moved closer to that condition in the last 26 years per Table 5. That said, the conditions described in the 3rd paragraph and the 3rd bullet are generally the result that would be expected from forest plan structural stage objectives for MAs 4.1, 5.1, 5.4, 5.43, and 5.6, which comprise 83.5% of the Black Hills National Forest, as discussed starting at the bottom of page 15.	It is unclear what desired condition is being referred to. If it refers to the description of what constitutes high ecological integrity in ponderosa pine, this should not be construed as a desired condition. Desired conditions and other plan components will be developed in the next phase of forest plan revision - plan development.
The first item under Need for Change should be identifying Desired Forest Conditions for the various Management Areas and for the Forest as whole in enough detail that management strategies can be developed to achieve those DFCs. Each of the MAs in the current forest plan have a description of DFC. For instance, the DFC for MA 5.1 includes “a mosaic of tree groups of different ages and heights,” “trees of all ages are present,” “there are some natural openings or meadows of various sizes and shapes”, and “a variety of forest structures is apparent with mature trees dominating the landscape”. If there is a problem with existing forest structure in MA 5.1, was that a result of the DFC, the Goals and Objectives, the Standards and Guidelines, or something else? Only after a new DFC is crafted can work begin on management strategies, measurable Objectives, and Standards and Guidelines, all of which can be developed, analyzed, and compared in various forest plan alternatives.	Thank you for this information. It will be more appropriately considered during the next phase of the forest plan revision process.

Comment	Responses
We generally agree with that the acreage of Spruce could/should be reduced and still be considered to have High Ecological Integrity. We note, in Table 2, that the acreage of Spruce increased from 2005-2011 to 2017-2019. Looking ahead to the Need for Change, we are concerned that the number of SCCs proposed in Spruce habitats, based largely on potential declines of Spruce acreage, will be at odds with reducing Spruce acreage to its historic level.	Thank you for this information. Desired conditions for white spruce will be more appropriately considered during the next phase of the forest plan revision process.