drawback is juxtaposition to private property and Silver City which lies immediately northeast of the area. Cooperating agencies oppose designation of this area as an RNA due to the potential threat of fire and insect problems developing on the Forest and impacting private property.

32. Fanny Boles: 880 acres of Management Area 5.4 (Big game winter range), located in Custer County. Species of interest include mountain mahogany, skunkbrush, and Ponderosa pine. The ponderosa pine and rocky mtn. juniper are scattered throughout, more abundant in the draws. Private property lies within about 0.25 miles from border. Part of a 33,856 acre Lower Beaver grazing allotment which would impact about 2.6 percent of the allotment. Biggest drawback is juxtaposition to private property. Cooperating agencies oppose this designation of this area as an RNA due to the potential threat of fire developing on the Forest and impacting private property.

33. Lemming Draw: 1,466 acres of Management Area 5.1 (Resource production), located in Custer and Pennington Counties, entirely within Jasper fire area. Vegetation type of interest is montane grassland. Private property lies about 0.25 miles from border. The area is part of a 15,296 acre Darrow grazing allotment which would impact about 9.6 percent of the allotment. The biggest drawbacks to this RNA are the juxtaposition to private land and impact on the grazing allotment. Cooperating agencies oppose designation of this area as an RNA due to the potential threat of fire developing on the Forest and impacting private property.

34. North Fork Castle Creek: 715 acres of MA 3.1 (Botanical Area), located in Pennington County. Vegetation types of interests include ponderosa pine and white spruce. Private property lies about 0.5 miles from border. The area is part of the 32,182 acre Reynolds Prairie grazing allotment which would impact about 2.2 percent of the allotment. The area is made up of very steep, rugged terrain that is essentially inoperable for timber harvesting. The grazing permittee has indicated he gets very little use of the area due to the rough terrain and other restrictions; therefore, its designation as an RNA would have little or no impact on him. Cooperating agencies take a neutral position regarding the North Fork Castle Creek candidate RNA.

35. In the event an area is designated as an RNA, the Forest Service should provide affected permittees with benefits of equal or better value than those due to allotment reductions.

Diversity

36. The more diversity contained within an ecosystem, the more stable and healthy the system. This well-recognized axiom of ecology was taken into account by the cooperating agencies, and was the original vision that drove formulation of Alternative 3. A spatially and temporally diverse forest of significant size will provide the most species richness and viability. The current lack of true (structural stage and vegetative) diversity on the BHNF is a concern for species viability and catastrophic insect-caused tree mortality and wildfires. This fact appears to have been lost in taking Alternative 3 from concept to application. Timber harvests and treatment acres in Alternative 3 are unreasonably low. Alternative 3 mirrors Alternative 6 with respect to hardwood and meadow restoration, is similar to

Alternative 6 with respect to treating ARCs and WUIs, but ignores treating much of the forest interior. Timber harvest and other silvicultural practices, when applied aggressively across the landscape, create more diversity and hence species viability.

37. The cooperating agencies had high hopes that Alternative 3 would allow the Forest to achieve diversity across the landscape. However, Alternative 3 does not cut enough trees to create a more open forest condition including more SS1 and SS2. . There are too many acres and too many trees in the 100-120 year age class (page 3-13, 3-14). According to the BHNF RIS database, there are about 407,000 acres of trees with a mean average diameter of 6 to 9 inches and about 127,000 acres with a mean average diameter of trees 10 inches and greater on suitable timber lands. This suggests that many of the overstocked stands on the Forest contain small diameter trees. The cooperating agencies agree with the desirability of having more large trees in the forest by focusing the growth on fewer trees. However, structural stages 3C and 4C stands will not produce larger trees due to the overstocked, high density condition. Also, the presence of MPB in these stands poses a direct threat to stand structure. Alternative 3, as written, is not aggressive enough to achieve diversity.

38. On page 3-17 Alternatives in Brief it is stated that the primary treatments to be used under Alternative 3 are "commercial thinning and small amounts of larger tree harvest removals." If this is allowed to happen, as shown in the outputs associated with Alternative 3, diversity is not created across the Forest. Instead, the same problem of pine encroachment, even aged stands, and homogeneity across the Forest are fostered. To actually create diversity and better ensure species viability, a much more patchy forest needs to be created. The planned treatments under Alternative 3 do not accomplish what the cooperators envisioned when creating this alternative. Instead, it was envisioned that more and larger patch cuts would be done, some stands would be left to age, others would be thinned, and a patchwork of hardwood stands would be encouraged.

39. Section 2-3.3.1, Objective 202c deleted: The USFS is commended for this proposal. Mountain mahogany stands are being reduced in quality and quantity on the forest due to pine encroachment. This habitat type is critical for wintering big game, and working to enhance this habitat type on the landscape is very important.

40. According to the DEIS, white spruce has expanded from 15,000 acres in the late nineteenth century to about 25,000 acres today (p. 3-18). The expansion has been attributed to fire suppression, as spruce is not a fire tolerant species. However, spruce's intermediate shade tolerance gives it a regenerative advantage under an existing canopy of pine or hardwoods. It is arguable that under the frequent fire regime of the late nineteenth century, spruce was held to the coolest wettest sites where fire was an infrequent visitor. With fire suppression, spruce has been able to move out of these naturally protected sites to areas that are drier, and more susceptible to fire.

41 Across the west, there is evidence of similar occurrences where shade tolerant, fire intolerant species have regenerated in the understory of a fire resistant canopy (ponderosa pine – Douglas-fir forests of the Colorado front range and Blue Mountains, OR; Sequoia – white fir forests of Yosemite). The result has been the creation of ladder fuels in the understory

that sets a stage for stand replacing crown fire. The prolonged drought in the west has stressed these shade tolerant species increasing their susceptibility to insect attack. Insect populations have increased, resulting in mortality in the understory and further adding to the fuel buildup in these stands. Forest health treatments focus on removing these shade tolerant species from the forest to return the ecosystem to its natural range of variability, reduce the fuel loading, reduce the severity of fire, and encourage the reintroduction of fire by prescription to control fuel loading.

42. The BHNF wants to maintain the current acreage of spruce by preserving the existing stands in Alternatives 1, 2 and 4. In Alternatives 3 and 6 spruce will be allowed to replace pine to make up for losses due to hardwood restoration efforts (Objective 200-01). The reasons given are primarily viability of brown creeper and American Marten. Hardwood restoration efforts will remove spruce from the cooler, wetter hardwood sites, thus confining its expansion to the drier pine sites.

43 The sustainability of the existing spruce acreage, especially coupled with removal of spruce from hardwood stands, is questionable. Aerial forest health survey results indicate an increasing trend of drought related spruce mortality in number of trees killed and area affected. The 2003 aerial survey indicated 57 acres affected and 193 trees killed, and 2004 survey indicated 396 acres affected and 824 trees killed. The mortality was caused by Ips spp. and spruce susceptibility was attributed to drought conditions (Schaupp, et.al. 2003, Schaupp and Johnson, 2004). This trend suggests that expansion of spruce into drier pine sites may not be sustainable. The presence of spruce ladder fuels in drier pine sites could also contribute to the development of extreme fire behavior in a wildfire situation.

44. The cooperating agencies disagree with the BHNF in their effort to encourage expansion of spruce regeneration into pine stands. Successful spruce regeneration will occur during wet years in stands that are at the limit of sites capable of supporting spruce. During drought, the spruce will be stressed, susceptible to insect attack, and will provide ladder fuels for blow up conditions during wildfire. The connectivity created by these multi-storied stands will create a corridor for wildfire to move into existing spruce stands. Since the Forest now has 10,000 acres more spruce forest than it did in the late 19th century, it is difficult to believe that the viability of brown creeper and American Marten depends on spruce expanding into sites that have not supported it in the past.

45 Alternative 6 is written to suggest pine forests around ARCs and WUIs will be managed as a single structural stage. The cooperating agencies believe pine forests around ARCs and WUIs can be managed for a diversity of structural stages including encouraging regeneration. Stands should be small and lack the within stand vertical diversity that encourages crown fires. However, vertical diversity should be encouraged between stands. The result will be an unevenaged landscape around ARCs and WUIs.

46. The cooperating agencies support the 46,000 acre hardwood restoration (Objective 201) in Alternatives 3 and 6. The Forest should also emphasize restoration of hardwood inclusions that is, restoring small pockets (1-5 acres) of hardwoods within larger pine stands. All

treatments for restoration of hardwoods must be protected from livestock and wild ungulate browsing to be successful.

47. The importance of bur oak to wildlife species is noted. Alternatives 3 and 6 plan to increase bur oak 30% (DEIS, page 3-24). This action is commendable, and we encourage enhancement of **mature, mast-producing** bur oak stands. Recent work by the Wyoming Game & Fish Dept. in the Bearlodge portion of the BHNF suggests that on bur oak available to browsing animals, annual utilization is exceeding 60% (Sandrini, 2003 unpublished data). This portion of the Wyoming BHNF has some of the largest and densest bur oak stands on the Forest.

48. As noted in this section, bur oak leaves and twigs do not have great nutritional value, but it is being consumed by deer in both South Dakota and Wyoming because deer are foraging on limited and available forage, not necessarily selecting the most nutritious forage among a diverse vegetation understory. However, oak mast is a valued forage and used by many wildlife species. The BHNF should address the need for **high quality** wildlife browse and forage in any discussion on species viability.

49. Forest-wide Guideline 2107 limiting pine encroachment into meadows and grasslands is commendable. We recommend it should be raised to a standard to better preserve diversity and reduce the risk of crown fires.

50. In Table 2-3 the annual estimated clear-cut acres in Alternatives 2, 3, and 4 are zero. This does not move the forest towards diversity across the landscape. However, 400 acres are slated annually for clear cutting under Alternative 6. Cooperating agencies support the need for clearcutting patches to achieve diversity, but these patches should be scattered across the Forest. Likewise, only 1,000 acres are designated to be harvest annually for POL under Alternative 3, while 4,000 acres are to receive the same treatment under Alternative 6. Cooperating agencies support the higher harvest of POL in Alternative 6, but again the harvest should be spread across the Forest. The attainment of diversity on the BHNF will require removal of more small trees, and a greater patchwork of structural stages created.

<u>Viability and Structural Stages</u>

51. On Page 3-16, the section titled Effects of Species-viability management on Ponderosa Pine it is stated, "Most emphasis species that occur on the forest are primarily associated with conditions favoring …early-successional … or late-successional stands." It is then stated in the next paragraph, "…ponderosa pine distribution would not change significantly among alternatives (but), there would be some differences," and the reader is referred to Table 2-5. An examination of this table (page 2-39) shows that no alternative drives the forest to substantially more early or late successional stages. Alternative 6 does the best job, but treatments are only focused along the WUI and around ARCs to increase early successional stands. The bottom line is that except for this, the alternatives do not differ significantly. An exception to this statement may be the planned increase in "late successional" stands under Alternatives 3 and 4; but late successional structural stage, 5, is identical amongst alternatives and 4C stands are incorrectly taken to be "late-successional." This again belies a problem with the current structural stage classifications. With no separation of tree

diameter over 9 inches, tree density becomes the measure of late succession. This is not always correct. Late successional stands are made up of old trees; they may be small diameter, dense stands; or they may be large diameter trees clustered with openings - more of a savannah. We suggest looking at the forest on a finer scale to better account for stands that are actually late successional, and not assume dense stands are necessarily late successional.

52. A serious shortcoming of current structural stage descriptions is that they do not quantify or give insight into understory. The understory of ponderosa pine stands often has more to do with the species composition occupying those stands than the pine trees themselves. Discussion of species understory requirements should be enhanced, and better considered in discussions of various alternatives effects.

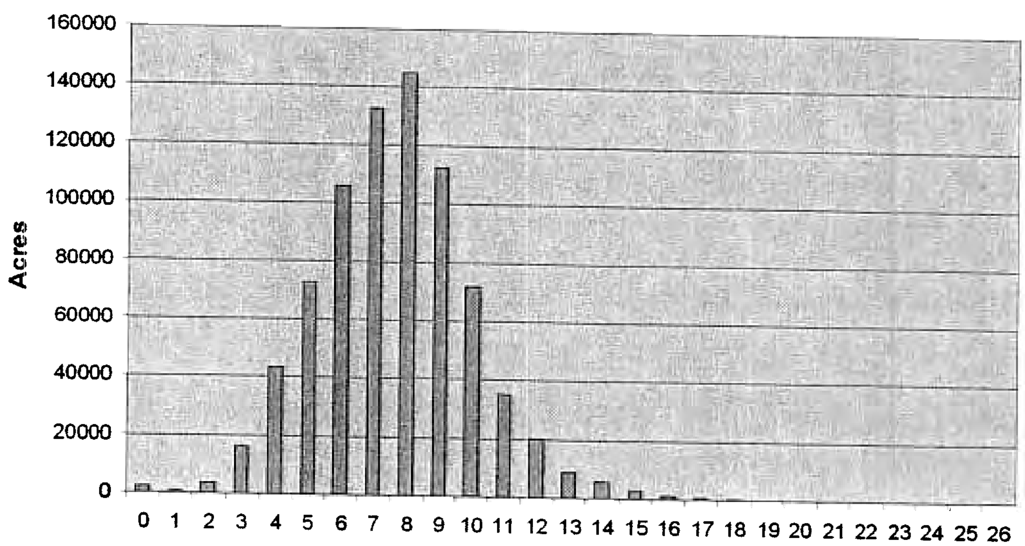
53 Upon reviewing the DEIS brown creeper analysis and ponderosa pine structural stage data, we find it disconcerting to lump all "mature" and "late successional" SS4 pine into a single category of 9" and above dbh. SS4 is a tree size designation based mostly on commercial timber interests and human-created inventory methods, not tree attributes or ecological site conditions that meet biological habitat requirements for certain vertebrates. Dense stands in the 4C classification are being identified as "late successional" when in fact a 4C stand may or may not have trees with a true diameter of over 16" dbh. 4C stands DO NOT necessarily mean contiguous acreages of large (≥16" dbh) pine that could provide aged trees with loose, platy bark for brown creepers. For those stands lacking the large diameter trees, identifying a 4C stand as habitat for late successional or interior forest habitat is incorrectly substituting dense canopy cover for large diameter trees. The current structural stage system is too inclusive and dilutes the real biological concern for those vertebrate species that require large-diameter (≥16"dbh) late successional pine stands. Designation of brown creeper, or any vertebrate species, as the MIS for late successional stands is biologically inaccurate based on current structural stage classifications. We believe that broad classification of tree structures will only continue to pit timber management interests against vertebrate conservation interests when the biological information remains masked by an artificial vegetation classification.

54. Therefore, we believe the current structural stage classification is too coarse of a biological filter and has been incorrectly applied in the DEIS for the brown creeper and other species that require late successional habitats. We recommend a new structural stage to better quantify and spatially identify larger-diameter trees and stands. For example, we suggest another structural stage of ≥16" dbh for large-diameter trees. This is in addition to the current SS5 which is more of a narrative or site characteristic for "old growth".

55. The DEIS did not appear to quantify or give descriptive narratives on the distribution, abundance and occurrence of larger diameter pine on BHNF. What percentage of inventoried stands in both the suitable and unsuitable timber base contained larger diameter pine, regardless of structural stage assignment? We thank the BHNF for kindly providing us the quadratic mean diameter data.

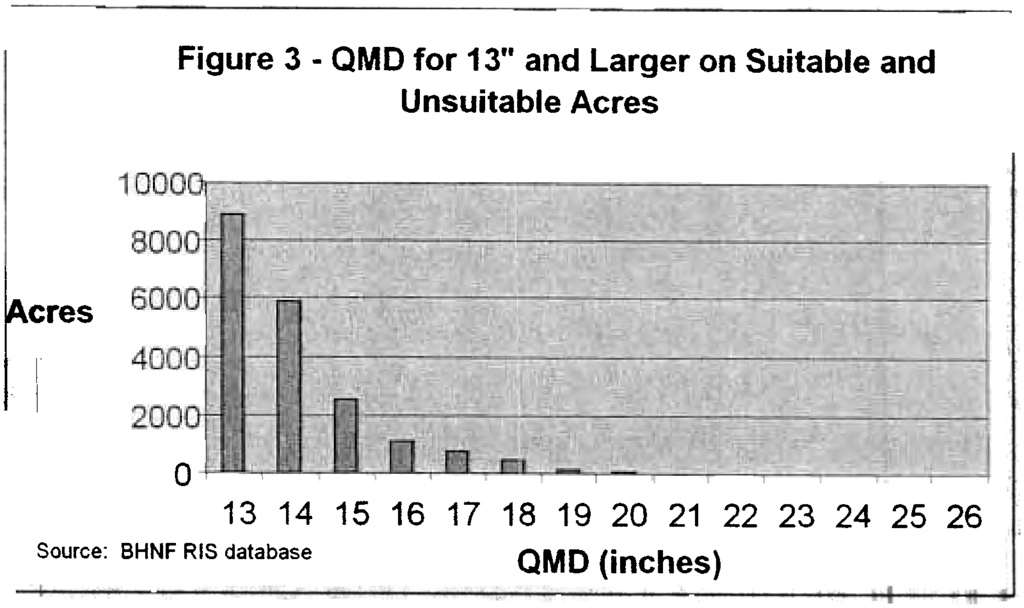
56. Using BHNF data, we created simple bar graphs. No statistical analyses were conducted. First we looked at the distribution of quadratic mean diameters (QMD) for inventoried suitable and unsuitable lands (all tree species) to find out how many acres of various tree sizes occurs on BHNF. Figure 2 demonstrates that the QMD of inventoried stands on suitable and unsuitable timber lands dramatically declines for QMD of 13" and larger (19,898 acres or 2.54% of 782,426 inventoried acres). Broken down by suitable and unsuitable, 2.7% (16,898 of 626,788 acres) and 1.9% (2,999 of 155,638 acres) respectively. Another dramatic decline occurs for QMD of 16" and larger (2,557 acres or 0.33% of inventoried acres).

Figure 2 - QMD for Suitable and Unsuitable Acres



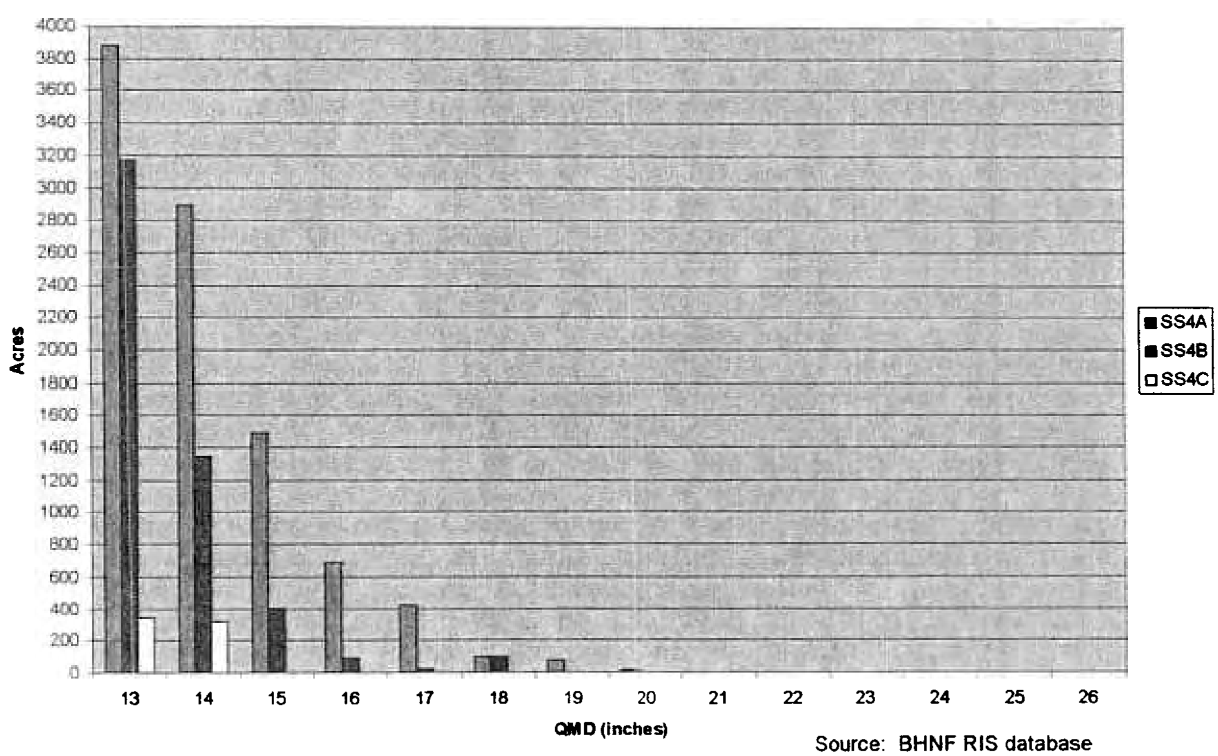
Source: BHNF RIS database

57. The Y-axis in Figure 2 is too large to best decipher smaller acreages so we refer to Figure 3, which represents QMD of 13" and larger. This information was not clearly represented nor analyzed in the Draft EIS.



58. The DEIS did not describe where or how these larger diameter trees occur on the forest such as occasional individual trees scattered among smaller diameter trees in structural stages other than 4 and 5. Or, are there contiguous stands of larger diameter trees which comprise the majority of structural stages 4 and 5? The QMD is an average diameter; therefore, large trees can be hidden by a preponderance of small trees.

Figure 4 - QMD 13" and above across SS4, Suitable and Unsuitable Acres

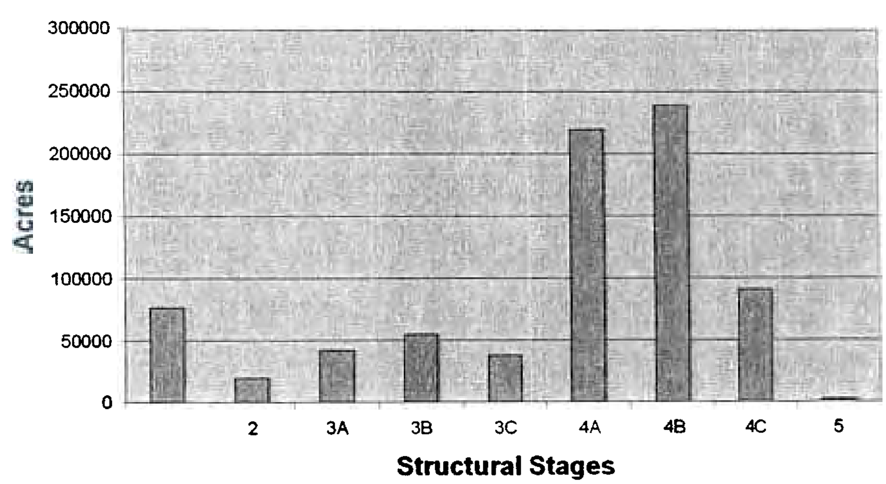


59. We recognize that structural stages are not pure stands of trees with similar diameters and that there is variation within. However, the larger diameter trees which are considered habitat for species such as the brown creeper, tree roosting bats, northern flying squirrel and northern goshawk are not obvious in the greatest abundance in 4C stands (Figure 4). 4C stands may have dense canopy cover of 70 – 100%, but apparently do not have the greatest abundance of larger diameter trees. This information was not found nor analyzed in the Draft EIS.

60. These simple bar graphs give some idea of the abundance of larger diameter trees and in which structural stage they occur. However, it still does not answer in what configuration (scattered individuals, inclusions or contiguous stands) these larger trees occur on the landscape. Therefore, upon reviewing the DEIS, it became difficult to provide the most useful comments to address species viability, R2 sensitive species, species of local concern and MIS for late successional ecosystems when current BHNF structural stage data provides information that is too broad and not applicable to biological systems.

61 BHNF data presented in Figure 5 indicate the following SS4 percentages by acres: SS4A: 30%, SS4B 30% and SS4C 13%. Over 70% of the inventoried forested acres are in SS4. 4C stands are only 13% of inventoried forested lands and further fragmentation of 4C stands with larger diameter trees was not analyzed in the DEIS. For species viability issues, we assert that the DEIS did not demonstrate how allocating 4C or portions of 4C for "late successional species" will meet late successional habitat requirements. In fact, a greater percentage of acreage of larger diameter trees is found in 4A and 4B. While canopy cover is less in 4A and 4B, the DEIS did not demonstrate how substituting dense canopy cover (C classification of 70%+) meets the habitat needs of late successional vertebrates. Structural stage 4C stands could very well be 9-12" black bark, even-aged pine with an occasional larger diameter pine scattered here and there.

Figure 5 - Suitable & Unsuitable Acres by Sructural Stage



Source: BHNF RIS database

Brown Creeper

62. The DEIS has proposed the brown creeper as an MIS for late successional habitats of pine and spruce. As an MIS for this ecological type, the FS presumes that habitat for brown creepers also provides habitat for tree roosting bats, flying squirrels and other species that need physical attributes of loose bark or cavities in large diameter trees (regardless of tree species) and on sufficient acreage and distribution to ensure viability. The figures presented in Table 3-37 were presented with a caution (page 3-180). While this is the best information gathered to date from point count surveys and reduced inventories in 2003, it should be considered baseline information at best until several more years of trend data are gathered. Therefore, comparisons across Alternatives are interesting but to date are speculative because the data does not have a strong indication of relative abundance or population trends, the data does not indicate a species viability threshold nor does it quantify what population level should trigger a concern. Further, the data has such a wide spread in upper and lower limit population estimates (spreads that double the population) that we don't believe that the data can give a threshold or point of concern until many years of trend data have been gathered.

63. Based on the presumption that Brown Creeper has been an historical resident of the Forest, and the fact that it is still present today, we must presume that it has remained viable through out the history of management of the Black Hills. The management history includes a wide variety of landscape and structural stage alterations Forest-wide, including the lumber mining that occurred prior to the Forest becoming a reserve in 1897. Yet, the brown creeper remained viable.

64. Table 3-37 in the DEIS and the narrative demonstrate that the population estimate spreads are not very different across Alternatives. No statistical analyses were presented to indicate which Alternative better supports brown creeper populations. Again, this demonstrates that 3 years of data is interesting and a good start at baseline, but the data does not support how proposed SS4 treatments among Alternatives will or will not alter current known brown creeper population estimates. The USFS does not make any estimates for a viable brown creeper population. Therefore, we cannot support any Alternatives that have proposed to reduce treatments in SS4C.

65. The brown creeper analysis and the recommendations for Alt. 3 and 6 basically suggests that there will be very limited opportunities to manage 4C stands in the next 10 years (10 years marks the end of the life of the 1997 Forest Plan). We have demonstrated that SS4 is too coarse for assessing habitat needs of late successional species. Alternatives in Table 3-36 that allocate a biologically unsupported percentage of SS4C trees at larger diameters for "late successional species" do not account for the fact that by acreage, more larger diameter trees occur in 4A and 4B stands.

66. The literature cited in both the USDA Forest Service 1996 Revised Land and Resource Management Plan EIS and the 2004 Phase II Amendment Draft EIS, suggests that brown creepers are interior forest species, nesting in conifers or hardwoods (dead or live) that provide platy or loose bark. Specific diameter class, age class or physiological characteristics of live conifers capable of providing loose bark are not supported in the

DEIS. Further, literature indicates that brown creepers expend less energy and forage more efficaciously when larger diameter forage trees are within the nest territory. Parental energy expenditure directly effects nest success and fledgling success. The DEIS did not consider minimal acreage requirements or minimal large tree densities for late successional species and MIS.

67. The DEIS, page 3-176 cited DeGraaf et al. 1991 as a literature source in which conifers with a minimum of 10 inches dbh are the lower limit for habitat. What DeGraaf actually states is, *"SPECIAL HABITAT REQUIREMENTS: Dead trees with loose bark, preferably with a minimum dbh of 10 inches."* DeGraff did not state "live trees." The literature we reviewed either suggests or documents that brown creeper nest sites in western states are usually behind loose platy bark or in deeply burrowed bark of conifers or dead trees. Here in the Black Hills, conifers include ponderosa pine and white spruce. We find no resources which document that live 10" black bark ponderosa pine provide platy or loose bark or deeply burrowed bark suitable for creeper nests.

68. Figure 3, page vi of the DEIS indicates virtually no change in SS 4C over the next ten years suggesting there will be no management in this structural stage. Rather than addressing the issue that brown creepers and other interior forest species require unfragmented stands of large diameter (>16" dbh) late successional or old growth forests regardless of how the FS categorizes pine structural stages, the FS has simply resorted to artificially addressing the issue by eliminating treatments of 4C stands. The FS has masked the real issue of nest-size trees for creepers because 4A and 4B stands appear to have larger average diameter trees.

69. The DEIS fails to analyze the consequences of the loss of significant portions of SS 4C and high density SS 5 stands in the reasonably foreseeable future due to bark beetles. The brown creeper has been selected as a management indicator species under all alternatives. It's ironic that the lack of management in 4C and high density 5 stands could have a significant negative impact on the species population.

Bark Beetles

70. A GIS comparison of bark beetle mortality as indicated by digitized Forest Health Monitoring maps and structural stage distribution across the Forest indicates 34% of SS 4C stands are infested with bark beetles. The recent history of mountain pine beetle (MPB) in the Black Hills, as exemplified by Beaver Park, indicates that the current MPB epidemic is capable of decimating high density stands with close to 100% pine mortality (aerial photographs, Pope & Talbot, Inc.). Consequently, based on 4C and 5 structural stage habitat requirements, it is probable that the Forest will be out of compliance with the Forest Plan as soon as this amendment is signed, regardless of which alternative is chosen. Also, any "hands off" approach to 4C stands as suggested by the static acreage in this structural stage over the next 10 years will render the Forest completely ineffective at managing the growing bark beetle infestations, potentially dooming these high density areas to stand replacement disturbance. If this trend continues, the brown creeper may experience an increase in population as they take advantage of higher insect populations and "loose bark" characteristics of trees following MPB caused mortality. However, as 4C and high density