

**MULTIPLE SPECIES INVENTORY AND MONITORING PROTOCOL
DRAFT REVIEW COMMENTS AND RESPONSES
JUNE 2005**

Comments are listed in numerical or alphabetical order by Region, Station, and non-FS reviewer

Region 1 - Malloy

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
1	267 (1)	I notice a trend to replace the term "presence/absence" with "detected/not detected." It's pertinent to these inventory methods, where a claim of absence is not really being made.	PM: Good suggestion - change made.
1		For those (like myself) who are unfamiliar with the FIA program, it would help to explain how the FIA points were randomly located within the hexagons. It would also help to explain briefly the advantages of the hexagonal grid over a rectangular grid.	PM: A hexagonal grid creates equally spaced cells - the geometric center of each cell is equally spaced from the geometric center of adjacent cells. This makes the grid more versatile in terms of subsetting, creating panels, etc. The FIA point locations are a function of past plot locations (Forest Health Monitoring sites, previous FIA points) and simple random selection within grid cells with no preexisting points located within them.
1	301 (1)	Manley and Roth (2004) does not appear in the local Literature Cited section (1.8). This is a good place for me to say that I always prefer to see all of the literature in one big section at the end of the document. It's much more convenient to use that way. If you're being constrained by an editorial convention for these Technical Guides, it might be best to just change the convention for all of them. [Easier said than done, I'm sure.]	PM: We will see what we can do

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
6	3040 (70)	I suggest that you consider toner instead of sooting. I imagine that Zielinski is pretty comfortable with sooting after using it for many years, but for use by perhaps inexperienced field crews, the argument in favor of toner is pretty compelling (J. L. Bellant. 2003. Comparison of 3 tracking mediums for detecting forest carnivores. Wildl. Soc. Bull. 31:744-747.). I have never used sootted plates, but I have used toner, and it seemed to work fine. A consideration is that the mammal crews for these proposed inventories will already be burdened with more equipment than any of the other crews. A bottle of toner is easier to carry than the torch or multiple pre-torched plates.	BZ: Yes, toner can be considered a suitable alternative to soot and the chapter will be modified to make reference to this option, and its possible advantages and disadvantages.
6	3114 (72)	It strikes me as unlikely that the Forests will be able or willing to recruit or assign people with enough experience to justify these grade levels. Our experience on the Lynx Survey was that there was a tendency to delegate the field work to the lowest possible grade level. The attendees at the training sessions were often Forest and District Biologists, but the people who actually conducted the survey work were usually GS-3s, -4s, -5s, and volunteers. The result was that the actual surveyors were often untrained, except through the direction they received from their supervisors, and unable to fill out many of the sections of the field form. The protocol doesn't mention who will conduct the training sessions. Will they be experienced people from research?	PM: A crew of 4 to 6 people must be supervised by someone at a higher grade level. A GS-9 or 11 District or Forest biologist could do it, but it is unlikely that they would have the time to provide sufficient oversight to ensure management quality standards were being met. GS-7 ideally would supervise more than 4 to 6 people, and could effectively supervise up to 10 field crew members. This illustrates the efficiency in multi-Forest scale implementation of this (or most) monitoring effort - smaller supervisor to crew ratios saves money. The problems described for the lynx survey are predictable and probably expected since field personnel were not trained and data collection was not coordinated across the range. Training for MSIM protocols could be garnered from a variety of sources, including research. Assuming Regional-scale implementation, we recommend coordinated training across the region, and involvement of research to the extent possible - at the very least in the development of a training program.
6	3196 (74)	Daveau et al. (1996) does not appear in literature cited (6.3)	Added to literature cited

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
6	3325 (76)	<p>I've heard Kevin McKelvey talking about developing a multiple species inventory method utilizing hair snares, and I now realize that he must have been considering it as a component of this MSIM protocol. I imagine that the analytical costs (\$10-\$20) are prohibitive. But, the snares would certainly be effective at identifying species too large for the track plates (black bears, coyotes, cougars, bobcats, and, perhaps, lynx). If the snares were placed inside the track plate covers, as I believe Zielinski has done, they would provide confirmation for questionable tracks.</p>	<p>BZ: Species ID from snared hair is problematic for a multiple-species inventory because nobody has yet developed the device that can collect hair from all the potential species that visit it. So, not only is it currently very cost prohibitive, relies on a method that requires several steps (including the lab) before identity can be confirmed, but it is inferior to track plates in a multiple-species detection context.</p>

Region 1 – Samson

Chapter ISSUE OR COMMENT

1, 2 1. not confident that the existing approach will work in grasslands, shrublands, or wetlands - should note that it is primarily a forested habitat protocol 2. design does not identify the population, so it is irrelevant to ESA 3. Not clear how presence/absence can be used as a population trend parameter 4. notes that number of points on some forests will be low and suggests that the only solution is to intensify the grid (too expensive) or narrow the scope to species or habitats of interest.

5, 6, 7 Protocols are outdated - The remaining chapters are a useful review of procedures into the 1990s. I would, however, prefer to see a discussion of either alternative (e.g., DNA) or traditional approaches that are not discussed (e.g., paired-sample designs but using FIA dominance types as the framework for the control and treatments). Clearly, DNA can be used to identify historic patterns (e.g., distribution) in populations, distinct population segments, net-effective population size, bottlenecks (as a threat to viability/sustainability), whether connectivity and other environmental factors are important, and so on.

RESPONSE

PM: 1) The survey methods were selected because of their versatility. None of the protocols are habitat specific, and most of them have been employed in a variety of habitat types. Specifically, Sherman trap grids, point counts, visual encounter surveys, trackplate and camera surveys, pitfall traps, bat mist net and acoustic techniques - these are all techniques that are effective in a wide variety of environments. We did not provide an exhaustive list of secondary survey methods, but it is likely that this is where specialty methods tailored to specific habitat types could provide the most beneficial complement to primary protocols. 2) The population of a species can be defined at any scale, so in fact the grid-based approach provides the necessary flexibility to define populations as needed for particular applications or concerns for any species detected. 3) the estimated proportion of sites occupied serves as an index of population change - MacKenzie et al. 2002 and program PRESENCE can incorporate change across multiple years, persistence, probability of detection, and habitat conditions into estimates of change and trend.

PM: Not sure what the reviewer is suggesting in terms of paired sample designs. We suggest that MSIM monitoring points can serve as a representation of conditions across the landscape against which specific treatment sites can be compared. BZ: Species ID from DNA extracted from snared hair is problematic for a multiple-species mammal inventory because nobody has yet developed the device that can collect hair from all the potential species that visit it. So, not only is it currently very cost prohibitive, relies on a method that requires several steps (including the lab) before identity can be confirmed, but it is inferior to track plates, for example, in a multiple-species detection context.

Chapter ISSUE OR COMMENT

Cost 1. costs can not be reliably estimated without a power analysis - thinks this can not be done prior to data collection 2. cost estimates for R1 inventory suggest that MSIM costs would be higher than estimated in protocol for region1

Other 1. noted that other biologists in region did not comment because although they see the need for monitoring, they don't think monitoring will ever be funded 2. AM section irrelevant - should address needs as identified in 1982 or new rule

RESPONSE

PM: Manley et al. (2004) did a power analysis to predict the number and composition of species adequately sampled. Most recently we conducted a power analysis on field test data - we found that Manley et al.'s estimates of number and proportion of species adequately detected were high, but representation was similar to predicted. Cost is not proportional to the number of species adequately detected. Not familiar with the R1 inventory protocols. What drives up the cost is accessibility - the cost estimates are based on a field test where 50 of the area was wilderness, but certainly costs will vary geographically.

PM: New rule integrated more fully into text.

Region 4 – Lampman

Chapter ISSUE OR COMMENT

1, 2 As an alternative [to a grid system], one could consider stratification by vegetation strata and focus only on those where we need monitoring, rather than densifying the grid to pick up sufficient numbers of sample sites, but this could reduce efficiencies of the project. 1) Bailey's ecoregions, TNC ecoregions, Maxwell subregions: None of these will address metapopulations of most species, and they do not overlay well with aquatic ecological units. Monitoring population trend at those scales in those polygons will not be possible. 2) Emphasis on the FIA-grid for sample design: The FIA grid as the basis of design may possibly pick up some of the non-linear aquatic systems, e.g., springs, but most of those are probably considered highly specialized habitat associations, which L302ff identifies as those that are likely to be underrepresented. The larger ones fall into the category of "lakes" or other possible large waterbodies, around which the MSIM design is to be adjusted and for which very little data are collected.

1, 2 Oversight of a program of this magnitude would require additional personal and would probably benefit from centralized effort, e.g., through the FIA group, research, Wildlife Ecology or Fish Ecology Unit, or other national level program. This would increase consistency, allow focused statistical analysis and support, and increase the likelihood that the effort will continue as needed despite shifting priorities or changes in forest personnel. In short, there is no current infrastructure to accomplish the MSIM as described. A centralized program would probably work best, both for oversight and long-term continuity. Hazards of putting the responsibility out to the forests would be that any year's worth of shifting priorities could cause a gap in data collection, which would disrupt the sample strategy or jeopardize the ability to obtain results after making investment into the program. This needs to be addressed. Is this being viewed as a separate off-the-top program? Where are the funds coming from? Who is going to oversee the program in the long-term? Etc.

RESPONSE

PM: 1) Maxwell's hierarchy is the standard for aquatic ecological unit designation, and is used as the basis for the AEUI tech guide. Not sure how you are equating ecoregions and metapopulations, since metapopulation structure is typically expressed at a smaller scale than ecoregions. We did not mention metapopulations in the tech guide, and such a large-scale monitoring program as MSIM is not likely to provide insights into metapopulation structure except where metapopulation structure is expressed at the watershed scale. 2) Not sure what the point is here. Aquatic sites are to be selected in association with each monitoring point, as per chapter 9. The minimum requirement for the selection of aquatic sites per monitoring point is one lentic and one lotic site (closest), so the configuration or size of the aquatic site should not affect its selection for sampling.

PM: The risks to continuity and consistency in absence of national oversight that you mention are true and important. If the agency chose to implement MSIM as a national program, many more of the potential benefits would be realized. None of the tech guides require implementation, nor do they establish national programs. These processes happen outside the process of tech guide development. If MSIM were institutionally linked to the FIA program, it would have an established structure for implementation, oversight, quality control, etc.

Chapter ISSUE OR COMMENT

1, 2

The logistics and infrastructure to obtain data quality is of concern. The approximation for R4 (34 million acres) would be $3.4 * 20 = 68$ observers per method. Multiply that by 5 core primary surveys and you have a need for 340 people. Training could be done en masse, but aspects of it may require at least 4 geographic locations to be able to reach experts and museum materials for the region's 4 major provinces – Great Basin, Colorado Plateau, Middle Rocky Mountains, Northern Rocky Mountains. Where are we going to get the people?

2

The narrative and Table 2.3 do not match and hence do not clarify things. For example, for Forest AB the narrative refers to trackplate and camera and goshawk surveys per Region B, but Region B does not have those surveys listed. Try placing the narrative information into the table format to display better the relationships and a clearer picture of the resulting monitoring program for a forest, which is far greater than the short table indicates. An example follows:

8, 9

1) Even with inclusion of a stream segment or portion of an aquatic system within an MSIM sample hexagon, finding or not finding a species does not say much about species population(s) or community structure in the system. Individuals can be upstream or downstream, moving in or out, and not always visible or identifiable through casual observation. [many more good comments]

RESPONSE

PM: The number of staff required to conduct the MSIM protocols are not strictly additive, rather they can conduct sampling sequentially. For example, the bird breeding season is generally only 6 weeks in duration. For a Forest with 200 FIA points, we estimate that a crew of 6 people could conduct the core methods at all the annual monitoring points on a Forest ($200/2/3 = 33$ points) in a 6 mo field season. A large forest of 3.4 mil acres, would have an annual sample size of about 95 points, so a crew of 18 would be required, not 340.

PM: Fixed

PM: Other than perhaps fish, individuals of most amphibian species reptile will not move more than a few hundred meters within a season, and if the habitat is suitable for a species and the population is not too sparse, it should be present within a 300 m reach. In other words, we tried to pick a reach length such that across the 3 reaches it is likely that they would encompass a variety of habitat conditions on most types/sizes of streams such that species that they were likely to contain some suitable habitat for most aquatic-associated species expected to occur in the sample unit.

Chapter **ISSUE OR COMMENT**

8, 9

The aquatic protocol will not provide sufficient data to conduct population trend. There will possibly be presence data but not absence data (at least not without rigorous study to determine likelihood of observation. Is a “not here today” truly an absence datum? Not all aquatic sites are the same. Not even all lotic sites are the same or all lentic sites are the same, resulting in differences in channels, riparian vegetation, aquatic biota, etc., probably with as much variation as terrestrial vegetation community types, all of which will influence species presence and hence population data.

8, 9

It is difficult to reconcile what is described in the MSIM regarding level of effort with the protocol it cites (Corn and Bury 1990). Corn and Bury 1990, page 7, identifies 3 constraints to survey site selection, none of which appear in the MSIM (avoid forest edge, avoid aquatic habitats, and cover as much of stand as possible). Corn and Bury 1990 says to restrict the survey to a small area (25 m radius circle, which is <.2 ha), 1 hour per small area), very much smaller than the 10 ha PSU. Is the PSU supposed to be subsampled? If so, how stratified? Corn and Bury 1990 recommend a 3-4 person crew, including one data recorder. This distinction is hinted at by the phrase “two observers,” but it is not clear that these observers are not also recording data simultaneously. (Perhaps in this day and age of data loggers, it’s possible to observe and record simultaneously, but this changes the actual amount focused on observation.) [lots more comments on this method - all good suggestions]

RESPONSE

PM: As long as we have repeat visits and a reasonable probability of detecting species if they are present, we can estimate the proportion of sites with presence for each sample period with known precision, and that is all we need to evaluate a change. The confidence and power of these estimates will be affected by the number and proportion sites estimated to have the species. Pilot work has shown that the visual encounter surveys with two visits result in a high probability of detection for most amphibian species (over 80%) - so sample size needs are quite reasonable - 150 to 200 sites - the number of sites on an average national forest as per MSIM.

PM: We increased the effort per unit area and clarified the number of observers.

Chapter ISSUE OR COMMENT

9

It is good that the MSIM is making one of the few attempts at addressing any entire aquatic-associated program instead of a taxa-specific program; however, it is incomplete. Why are the addressed aquatic-associated vertebrate monitoring species in the aquatic vicinity? Food? Thermal? Moisture? Are they interacting with the wholly aquatic organisms? Which ones? Where do they go when they are not in the aquatic vicinity? Unfortunately, it seems that the MSIM is the only location for looking at aquatic or aquatic-associated biota other than fish species, which unfortunately is the only aquatic taxa in the field component of the AEUI. Recommend either establishing a separate tech guide to look at aquatic communities and identifying a way to link aquatic data or greatly expanding the aquatic protocol so that it would address complete aquatic communities.

10, 11

1) Reliance on or emphasis of FIA data for habitat information for aquatic systems has the potential for identifying misleading relationships. Aquatic systems, except possibly springs (but not their outflows), are influenced by conditions in the drainages that contribute to them, which generally is not limited to one slope or one aspect above them. The FIA or other measurements depicted in the protocols do not address how to obtain information indicative of an entire influencing watershed. [many more good habitat comments]

RESPONSE

PM: Chapter 9 is intended to target aquatic and aquatic-associated species, not just those in the vicinity of aquatic habitats - attempted to clarify this in the chapter - we also created a strong link to AEUI

PM: By creating a larger sample unit for aquatic evaluations (HUC or 10km² sample unit) and increasing the number of aquatic sites sampled, this problem should be rectified. Additional comments incorporated into final

**Chapter
Other**

ISSUE OR COMMENT

The MSIM is one of the few (if any) approaches to multi-species, multi-taxa characterizations. This is a major undertaking and should be applauded. Although we have concerns about how the aquatic portions of the monitoring program are described, the hope is that the multi-taxa approach is something that can be made to be feasible and useful. If the agency establishes and endorses the MSIM as its monitoring standard, we recommend soliciting an independent review of MSIM and other large-scale monitoring programs from the statistical advisory group at the Inventory and Monitoring Institute. If MSIM is to be pursued, it makes most sense for it to be a multi-agency effort. An initial step in making this work would be to solicit support from state Fish and Game directors. Terrestrial emphasis: The MSIM has a definite terrestrial emphasis. It will meet only minimal aquatic needs for even the most basic questions identified on L948ff.

RESPONSE

PM: The Statistical Advisory Group at IMI was closely involved with the development of the MSIM protocol. Ideally, the AEUI and MSIM would be linked to provide a more comprehensive monitoring program for populations and habitat. At the present time, MSIM focuses on populations, with a habitat link, whereas AEUI focuses on habitat conditions. MSIM identifies the habitat measures from AEUI that are most directly relevant to non-fish vertebrates. These could be expanded to include a larger host of measurements if/when the protocols are linked. The States are interested in the MSIM protocol and there is a logical fit there - getting a coordinated effort going from the start is difficult, but if it is implemented in various states, coordination will strengthen naturally.

Region 4 – Williams

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
1	268-269 (1)	discuss reference conditions. There is no link between the MSIM protocol and the establishment of reference conditions. Probability sampling is poorly adapted to sample objects of specific interest that are by definition not common on the landscape. This section seems at odds with the assumption on page 1 line 268-269 on probabilistic sampling.	PM: The preponderance of reference conditions on NFS lands depends on the resource you are trying to characterize and how strictly you define reference conditions. In terms of the definition, if strictly defined, there are no reference conditions any where because changes in ozone, climate, and fire regimes have altered every acre. If we relax the definition with the understanding many reference sites are not pristine, then we are likely to find substantial areas on NFS lands that can be used to inform a characterization of reference conditions, such as wilderness areas, RNAs, some experimental forests, etc.
	304 (1-2)	Pages 1 and 2 suggest that the scale is at the National Forest or larger scale of even “ecoregion” scale. The test was 40 points in 100,000 ha area (p.2 line 304). The test is small for a forest and far too small for an ecoregion. Page 30-32 mentions several different ecoregional classifications and dismisses existing Forest Service direction to use Bailey, 1995. The protocol seems to suggest yet another incompatible ecoregion classification but does not come right to the point. There is no clear statement of what the vegetation data is to be used for and how it is to be applied other than to “characterize habitat conditions.” Objectives and intent of the vegetation data are not specified so the inclusion of tedious, costly and inappropriate sampling methods is questionable. This point will be discussed in greater detail. The MSIM protocol is designed to link to both the NFS vegetation classification system (SAF types)...” This is factually inaccurate and if the authors were aware of the FGDC standards they would know that.	PM: The sample size associated with the test is greater than the average number of points that a single National Forest would sample in a given year, assuming they sample 50% of the grid (~75 points) over a 3 year period (~ 25 points per year). The test was intended to evaluate the effectiveness of the protocols and the feasibility of their implementation - these objectives did not require sampling across an entire ecoregion. The ecoregions are discussed simply to suggest that Regions work together to create compatibility in data collection relative to ecological boundaries (ecoregions), in addition to administrative boundaries (Forests and Regions) to enhance the suite of species for which range-wide data is collected consistently. As you point out, Bailey's does not fully reflect zoogeographic patterns which explains the difference between it and the other ecoregional classifications discussed.

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
10, 11		<p>There is no mention of the Existing Vegetation Classification and Mapping Technical Guide out for review since April of 2003 on the same Ecosystem Management website as MSIM. The existing vegetation classification and mapping guide provides much information highly applicable to the MSIM draft. If the MSIM draft protocol followed existing Agency policy, standards and existing direction; then some of the following problems would have been avoided.</p>	<p>We did not see the need to adopt one corporate ecoregional scheme as part of the MSIM protocol because plans will be developed at the Regional level and the monitoring points can be post-stratified by what ever scheme best reflects the processes associated with each species (e.g., terrestrial or aquatic). WWF ecoregional classification is the closest equivalent to Bailey's in terms of providing information about associated resources. The habitat characterization follows FIA protocols, so if the sampling methods are inappropriate, it would suggest a larger problem with FIA. The existing vegetation technical guide was consulted, but it does not offer specific field techniques for sampling vegetation in a consistent manner across NFS lands. FIA protocols were the most logical to adopt, given that MSIM is co-located with FIA.</p>
	Cont.		<p>PM: The challenges you identify are important, but they are not unique to MSIM - as you point out, they are associated with any inventory or monitoring effort that attempts to link habitat and population measurements. MSIM calls for collecting habitat data at the monitoring point and remote sampling locations, so it is not dependent upon data collected at the FIA point itself to characterize habitat conditions associated with plant and animal species status and change. Just as with FIA, plots that occur in very different habitat types (forest vs. meadow vs. shrubland) will not be averaged. The FIA point is located within the MSIM sampling hexagon, so it is not 100 m away, but rather animal sampling is occurring all around the FIA point.</p>

Chapter	LINE (PAGE) comment and answer continued	ISSUE OR COMMENT
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RESPONSE

The links between vegetation data collected at the FIA point and MSIM data are expected to be two fold: 1) the spatial co-location of FIA and MSIM points means that they are likely to experience the same changes over time through natural and anthropogenic disturbances, so FIA-based evaluations of changes in habitat at larger scales (forest, multi-forest, and regional) should be a reasonably good representation of changes in habitat conditions at MSIM monitoring points; and 2) habitat relationships observed in MSIM plant and animal data will enable the development of predictive models for species occurrence (or abundance) - FIA points could then be used, in addition to or perhaps eventually in lieu of collecting habitat data at MSIM points, to characterize habitat conditions and make inferences about species populations. All field methods will have limits in terms of the scale at which they can characterize the environment - larger scales are best characterized using remotely sensed data, and the variety of options for the use of remotely sensed data are vast.

Region 5 – Craig

Chapter	ISSUE OR COMMENT	RESPONSE
1, 2	likes link to FIA and cross-land ownership aspects - confusion about whether FIA provides habitat data or if MSIM collects additional data	PM: FIA data provides primary source of habitat data for sampling that occurs at the same scale as the FIA data - within a 1 ha area around the FIA point. FIA point also serve as a focal point for special data collection and modeling efforts, such as post-fire evaluations, which would provide valuable data on change in habitat conditions for plant and animal species, particularly if the special effort included post-event plant and animal sampling. Habitat data could be restricted to the center point, but in the first sample period, we recommend that habitat data also be collected at MSIM sampling locations that occur outside the 1 ha plot to strengthen habitat modeling capabilities (higher sample size, greater predictive capability)
1, 2	It is unclear as to whether the Regions will be required to implement the MSIM protocol	PM: The national protocols, including MSIM, are developed to create consistency in data collection to facilitate data compilation and summary at a range of spatial and temporal scales. If/when Regions or Forests engage in data collection for a particular purpose (e.g., goshawk surveys, multiple species surveys), they need to follow the national protocol if one exists.
Other	liked the checkpoints discussion	

Region 5 – Robinson

Chapter	ISSUE OR COMMENT	RESPONSE
1, 2	1. The sizeable length of the Technical Guide is probably necessary, given its diverse content. However, the amount of time it would take to read and become familiar with a document containing such detailed and lengthy content may necessitate a short-term training cadre that would be responsible for helping to implement the MSIM protocol throughout the various Regions of the Forest Service. <i>Perhaps the need for training of this kind should be mentioned explicitly as part of the National Responsibilities (lines 585 – 609)?</i>	PM: Good suggestion - text added.

Chapter ISSUE OR COMMENT

3, 4 (1) Admittedly, only a portion of the MSIM data pertains to birds; however, as part of the process of analyzing the data and summarizing the results each year, with in-depth analyses every five years, please give consideration to how this process should be coordinated with Jon Bart's Coordinated Bird Monitoring effort. (2) "ideally each visit is to be conducted by a different observer": my only concern here (and I don't know if it is a truly valid concern) is that by requiring a different observer on each visit, you need a fully-staffed survey team and therefore must find a larger pool of qualified candidates to be on your survey team (otherwise it would be difficult to have enough observers to allow you to rotate them between sites). Because highly skilled observers are hard to find, it seems like this requirement may increase the chances that you may have observers on your survey team who lack the complete set of skills necessary to perform these surveys.

10, 11 1. many of these environmental variables will show "effect", but not "cause". In other words, by measuring these variables, we will see the effect of habitat changes, but not necessarily understand the causes behind said changes. To what extent will the MSIM protocol be able to integrate with the FACTS database or with other databases that record information about the treatments we make across a landscape?

RESPONSE

PM: (1) Coordination with existing efforts is emphasized in terms of data compilation and analysis, however we did not mention the Coordinated Bird Monitoring specifically because this is just one of many current efforts and they will change over time. (2) Implementation of the point count protocol on a National Forest (average of 33 monitoring points surveyed per year, based on the average of 200 FIA points per Forest) will require 2 to 3 observers to complete - coordination among multiple forests would result in larger crews. We are just suggesting that observers be rotated among points.

PM: Ideally, Regions will evaluate habitat and population changes in light of management activities occurring on the ground. The analysis sections of each chapter were generally limited to the specific data gathered by the detection method. However, chapter 1 and 2 discuss the opportunity that these monitoring data provide to retrospectively evaluate the source of change in habitat and populations across points and use the observed relationships to pose hypotheses that can then be used to inform management and focus research to confirm or deny. Certainly, more direction and guidance could be developed in field guides supporting the national technical guide to facilitate their important evaluations.

Chapter **ISSUE OR COMMENT**

Other 1. the statement made at lines 596-597 is key to the successful storage of valuable MSIM data in the NRIS modules. *I therefore believe that a more explicit and detailed level of commitment should be made here to describe the level of support that will be given to the MSIM-NRIS link.* For example, is sufficient funding already in place to provide this support? Do we know who or which teams would be used to staff out this work? Has an Action Plan already been prepared? Certainly, if we go through all the trouble to collect this data, we would want the data to be readily available (in a timely manner) to the employees of the Forest Service via NRIS, our primary corporate database; otherwise, these data will reside in perpetuity in the third party Access and Oracle databases that are described in this guide as the initial data repository for the information collected using the MSIM protocol. [there were many more suggestions made on how to manage data]

RESPONSE

PM: Great suggestions on data management. The national technical guide could not go into great detail on data management, but in implementation, these questions and suggestions are critically important to ensure that data integrity is maintained and that data are readily available at all levels of the organization. It is the commitment of NRIS to support national protocols, so once MSIM begins to be implemented, NRIS will ensure that data management systems are in place to receive the data.

Region 8 – Garcia

Chapter	ISSUE OR COMMENT	RESPONSE
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8, 9	just a cursory look over suggests the Amphibian section of the MSIM document is considerably problematic. Whit Gibbons and I briefly discussed it today and are in complete agreement that some major editing should occur before it goes out.	
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		PM : Whit and colleagues contributed substantial specific comments that were incorporated - most significantly, herptefaunal and bird/mammal searches were separated.
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RMRS – Flather

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
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2		You make it clear that this version of the MSIM protocol is focused on National Forests and Grasslands. I think the document should make this explicit acknowledgement when appropriate. The earlier in the chapters the better. For example, in Chapter 2, page 2, first sentence under “Target Data” section (2.2.1), consider: “The MSIM protocol provides reliable, standardized data on status and change in the distribution and site occupancy for a large number of plant and animal species that occur n National Forests and Grasslands at the Forest, Regional, and national scales.” This brings up an issue that I don’t recall seeing addressed. What happens in those cases where an FIA point does not support timber? In those cases where the land cover is grassland, shrubland, or woodland (e.g., juniper) will the MSIM sample unit be established? You acknowledge the issue on page 5 (1 st paragraph), but you don’t explicitly address what the implications are for MSIM point selection. It should be clear in Chapter 2 whether FIA points that are non-forest (timber?) will be monitored under MSIM.	
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			PM: Good suggestions. And yes, all selected MSIM points will be sampled regardless of the vegetation type in which they occur. Hopefully this was clarified in the text.
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Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
	2	Note that I changed the “proportion of sites occupied” to “site occupancy” in the above suggested wording change (also note that this issue surfaces again on page 25, 1 st paragraph). There is nothing wrong with measuring proportion of sites occupied, but site occupancy seems more general to me. I’ll also admit that my motivation to change this sentence stems from a subtle problem that can arise when estimating proportional occupancy. It all has to do with what gets used as the denominator. If the full set of survey points get used, then there is no ambiguity in the interpretation. However, the literature sometimes estimates the proportion of habitat occupied. That stems from some of the metapopulation analyses that show that suitable habitat can be unoccupied because of metapopulation dynamics. You will therefore see response variables in the literature that look at proportion of suitable habitat occupied.	PM: Great suggestions..
	cont.	Since habitat can be gained or lost over time, the denominator in that response variable can change, which can make interpretations difficult. This is a subtle point, but one that should be kept in the back of your mind. I talk about this issue in the Flather and Bevers (2002) paper (see page 50, 2nd column and discussion of figure 5).	
	2	Is there a reason why we can’t implement this on other public lands? Is this primarily a cost issue? Since FIA already has the necessary agreements in place to inventory on other public lands, it would seem to make sense to piggy-back on that for MSIM.	PM: No reason that MSIM can not be implemented across land ownerships. It is one of the primary features that is attractive about linking to FIA.

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
	2	Page 9, last paragraph. Not sure I am clear on what is being described here. What do you mean that monitoring points are stratified by FIA hexagons? Do you mean that the stratification used by FIA (multiple hexagons assigned to a stratum) will be used for MSIM? When I think of a stratified sample, I envision multiple samples within units that are in some sense homogeneous (e.g., some physiographic stratification). But my understanding is that there is one MSIM sampling unit per FIA hexagon. Is that right? This just needs some clarification.	PM: Attempted to clarify in text. Essentially, the FIA hexagons spatially stratify the location of FIA and MSIM points.
	2	Figure 2.4. I would be consistent in how you present these two classification systems. That is, provide the biome legend for Ricketts et al. and provide Province boundaries in the Bailey map if you provide them in the Ricketts map.	PM: We looked at the classification schemes again, and determined that biomes and divisions were the most compatible scales in these two classifications - could be interpreting it incorrectly, but based on this evaluation we did not change it.
	2	Page 19, last paragraph (under Ancillary Data). I would make it clear that abundance estimates are being derived from occupancy data. For example: "Guidelines for generating and interpreting these additional population and community metrics from presence/absence data need to be developed."	PM: Good suggestion.
	3	In my mind there are mixed signals in Chapter 3 related to species presence/absence vs. individuals monitoring. This needs to be made clearer. Either birds will be monitored as P/A or will be monitored as individuals and distance.	PM: Attempted to clarify.

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
3		You state on page 3, 1 st paragraph that by recording species detections in 3, 2, and 5 min intervals that you would then be able to compare with other monitoring systems. That may not be true. If in fact MSIM is focusing on presence/absence of species at a point (and is not counting individuals) then I don't think MSIM will be comparable to existing inventories. I should not be so definitive with this claim since it is really a question for research to determine. But here is my concern. An inventory that is focused on species P/A at a point will likely detect more species than an inventory that is counting total individuals (and their detection distance). Having to keep track of all the individuals of common species would seem to affect the detection of rarer species. For this reason I would not claim that MSIM would be comparable to existing protocols, unless existing protocols are also focused on P/A monitoring.	PM: You raise an important concern that was addressed in part in earlier revisions by making abundance estimates (i.e., recording all individuals seen and heard and their distance from the observer) a secondary survey method. Most managers and scientists have been confused as to why we would not record all individuals during a point count, and my experience has been that point counters work just as hard at recording all species they detect as recording an accurate accounting of the number of individuals present. However, you raise an important point that could be evaluated fairly simply in field trials. My guess is that differences, if they exist, will be subtle and swamped by differences in observers. Also, if probability of detection is calculated, I think virtually any data sets can be compared.
3		. Page 3, 3 rd paragraph. Consider: "Observers record all bird species (not individuals) detected, as well as"	PM: Done
3		8. Page 5, 5 th paragraph. Why is it important to train observers on distance estimation if they are simply keeping track of species detected?	PM: Moved to secondary survey methods
3		9. Page 7, 3 rd paragraph. Some of these analysis approaches require information on individuals. I would focus on those that only require P/A data.	PM: Attempted to clarify

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
3		<p>Page 8, under abundance estimates. I understand this perception, but again I would be disappointed if bird point counts were done under a protocol to count individuals. Since this is under the “Point Count Augmentation” section, that implies to me that some Regions may elect to count individuals, whereas other may not. If this occurs, then national-level analyses will not be possible (or much more complicated) for the reason I outline in comment #6. If observers need to keep track of individuals and distances, then the benefits of a simple P/A survey (particularly as it relates to monitoring rarer species) may be lost. Recall the analysis I did following the Denver meeting where I took the national list of MIS, Sensitive spp, and potential focal species from Christina and looked at the average number of individuals detected on BBS routes. The modal class was always (I think this is true...) the rarest category (analysis done at the Bailey Province level). I am worried that many of the species that are considered MIS would not be adequately monitored if individuals and distances are recorded.</p>	<p>PM: See above. I hope this concern can be addressed effectively in implementation - implementation will provide data and perhaps fund associated research that can quantify the risks fairly quickly and generate more specific direction.</p>
	cont.	<p>Again this is a research question. However, it would seem to make sense to me to start simple (P/A data) and add complexity (individuals and distance) if research can show that important information on species of concern are being lost. If Regions want abundance information, then I would feel better if a separate crew was trained to survey individuals and distance. But I realize that this is probably cost prohibitive.</p>	
3		<p>8, 4th paragraph. The He and Gaston work focuses on how to estimate abundance from occupancy data. I would <u>not</u> cite this work as justification for monitoring individuals. The point of this literature is to do what you suggested in Chapter 2, page 19 (see comment # 5 above).</p>	

RMRS – Wilson

Chapter ISSUE OR COMMENT

- 1, 2 Will the exact MSIM plot locations be made available, and to whom? Currently FIA does not provide exact coordinates, even to the general NFS employee audience, except as defined by the purposes in an FIA-NFS MOU. The intent is to protect field plot integrity. However, we do provide “fuzzed” coordinates (1/2-mile) for a variety of NFS and public applications. If it is known that the FIA plot is within 100m of a known MSIM plot, this sort of negates the ½-mile fuzz approach...
- 1, 2 Coordination with FIA - This is a critical element that also needs to be addressed in the Forest Responsibility section as well.
- 10, 11 Although the sample layout generally encompasses the FIA plot, I did not see how the relationships, or scale differences, between the small FIA plot and the habitat covered by the MSIM plot was addressed. I can visualize many situations where the MSIM vegetation will not be adequately sampled by the FIA plot; the FIA plot may sample a 2-acre patch of one forest type that is a mere inclusion in the broader type covered by the MSIM plot. In addition, 5-15% of current FIA plots have at least 2 distinct conditions (Forest/nonforest, one type vs. another, etc.) There is just too much local variability in the forest, particularly in the West. The Interior West FIA Program is currently in the process of developing a variety of land classification maps (forest type, stand size, basal area, etc.) using FIA field data, MODIS 250m imagery, and many other ancillary data layers. We are finding that there is a vast amount of “noise” inherent in using four small 1/24-acre subplots to describe even a 250m cell. And the some of the MSIM sampling covers areas larger than that. Rather than linking the MSIM plot to the FIA ground plot (where there is not a 1:1 relationship between FIA habitat data and the MSIM sample data anyway), why not collect some quick general on-the-ground vegetation surrogates to classify the landscape of the MSIM plot (such as forest type,

RESPONSE

PM: The MSIM plot locations are confidential, as are the FIA points. There is an MOU between NFS and FIA regarding the MSIM protocol, including plot locations. FIA is to generate the off-set point locations, and they are to be kept confidential to all but those responsible for data collection including contractors through the same procedures used for FIA plot locations.

PM: Good suggestion - done.

PM: Good suggestions and identification of difficulties faced by existing FIA protocols. The habitat measurement protocols remain consistent with FIA in this first version of the protocol because it allows MSIM to integrate with FIA more readily (not only data, but support mechanisms such as data bases, field data recorders, etc). Further, for the first round of sampling, it is important that detailed, spatially co-located habitat data are collected so that habitat relationships can be established for as many species as possible. Based on the outcome of habitat relationship modeling, habitat protocols may be altered (simplified, reduced, etc) to most efficiently monitor key habitat features.

Chapter ISSUE OR COMMENT

stand size, crown cover, basal area or such) and then link the surrogate to the FIA data set (with some ecosystem- or geographical setting-specific models) to obtain a summary of the detailed forest attribute

RESPONSE

SRS – Hamel

Chapter ISSUE OR COMMENT

1, 2 What a wonderful development, to take advantage of the existence of FIA as the basis for wildlife and other resource monitoring. I cannot praise it enough. As far as I know, National Parks don't have FIA points!! That was among the toughest things to notice about SOFIA when checking for old forests.

1, 2 With all due respect, our managers in the Southeast probably don't have the time to do too much of this at the Forest and District level. This plan is that of a sound activity. The activity is going to be an "unfunded mandate" for the NFS at the District level.

3, 4 Winter birds are very important objects of management in southern forests, and the protocol appears to ignore this possibility. Likewise, management actions on forests like the DeSoto are probably important for migratory birds during transit as well, which kind of resource is not included in the monitoring protocol very well either.

RESPONSE

PM: National Parks do have FIA points - they occur on all land ownerships. Federal lands were not always sampled, but for the past 5 years at least they have been included in sampling scheme.

PM: The development of national protocols is to provide a consistent methodology across NFS lands for data collection. The MSIM protocol is designed to be a low-cost option for monitoring many species of concern and species diversity. The FS has a poor record of meeting its plant and animal monitoring obligations - certainly, the lack of reliable, well-designed, standardized methods is just one limiting factor.

PM: We included a non-breeding season bird sampling as a secondary sampling method.

Chapter **ISSUE OR COMMENT**

10, 11 Why [collect habitat data]? If the animal data are to be associated with the FIA point, why not use the FIA vegetation data in the protocol as well??? other approaches are not even cited, like Wunderle, 1994, GTR SO-98, Huff et al. 2000, GTR PNW-501, Hamel et al. 1996, GTR SO-120. It demonstrates the western emphasis of the entire document

Other My general comment is that this is a sound and well thought out document, with slightly too little attention paid to documenting the vegetation measurement sections. I applaud the authors. It is also likely going to become a beautiful shell of something for which the funds to execute it at the NFS district level are insufficient.

RESPONSE

PM: Habitat data are collected in the first round of sampling to ensure that habitat characteristics were described at the same time and spatial location as the animal data to enable the development of habitat relationship models, which in turn are used to as the basis for making inferences about the status and change in habitat conditions for individual species and species groups. FIA data, as well as any additional habitat data that are collected in association with the monitoring point (field or remote), may be used as a source of data for monitoring change in key habitat features. FIA protocols served as the basis for the habitat conditions section. Regions may choose to add or amend beyond the FIA protocols as needed to meet their needs, as long as they are applied consistently throughout the Region.

SRS – Herbert

Chapter ISSUE OR COMMENT

Other the most common thread among the "general comments" was that we don't see how this monitoring program can be implemented in such a way as to provide useful data; such a monitoring program will require vast amounts of money and well-trained, long-term field crews that we currently don't have (at least not to the extent needed to do this job). Some mentioned concern that if this task is undertaken, what else WON'T get done? And will we have a false sense of security that are we are meeting our monitoring responsibilities, when in fact the number of visits, season of visit, computer software to collate/analyze the data, and infrastructure (vehicles, housing field crews, traps, radios for safety) may well be inadequate to detect changes in population trends. Some reviewers felt these funds would be better spent on monitoring populations of "species of concern" on the national forests.

RESPONSE

PM: The pilot work suggests that this type of approach is the least expensive per unit area to obtain reliable population change data on species of concern and biological diversity. Although this approach is not free, we have yet to see an alternative proposed that can be consistently implemented across multiple taxonomic groups and all national forests. The impetus for MSIM was because there are too many species of concern to address them individually. We also need an approach that does not duplicate the generation of environmental data at sample sites unique to each species of concern. The cross-taxonomic aspects of the MSIM protocol have the added benefit of providing rich contextual data for interpreting the potential causal factors for observed changes in populations of individual species of interest, and allows the NFS to address questions about the status and change of biological diversity, as per the Montreal Process Criteria and Indicators.

The pilot work and basic simulations have shown that the number of visits specified in the MSIM primary protocols are adequate to accomplish the minimum monitoring objectives. Sample size adequacy will vary among species, but is expected to be sufficient for at least 50% of all species at the ecoregional scale. It has not been our experience in implementing MSIM or in research directed at a diversity of taxonomic groups that long-term employees are required to collect the data in a quality manner. Certainly, implementing a structured monitoring program where one did not exist previously will require reordering priorities. It is widely thought that much of the monitoring currently being conducted is not designed in a manner that will provide useful data - a redirection of effort is expected in such cases. the basic parameters of the MSIM protocol can be expanded as needed to meet Regional objectives, but if we do nothing, we make no progress.

SRS – Kelly

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
1, 2	(14)	MSIM is linked or integrated with the FIA grid. This can raise concerns from the FIA program, primarily related to the integrity of the FIA sample. These concerns have been discussed with people developing MSIM at a FIA Management Team meeting a year or so ago. These concerns have been largely addressed through mechanisms that are already in place. It would probably be best if these concerns and ways to address them were incorporated into the document (I did not find them, if they were already there). While the issue on NFS lands relates to sample integrity, on p. 14 it's mentioned that there is an opportunity for extension to non-NFS lands. Privacy could very well be a concern for this extension, and it's not clear how these concerns would be addressed.	PM: Good suggestion - emphasized in text.

SRS – Loeb

Chapter ISSUE OR COMMENT

1, 2 1. You state that species with limited ranges, highly specialized habitat associations, or low detectability will be under represented at scales approximating 100,000 ha. Unfortunately, a number of the national forests in the Southeast are < 100,000 ha (e.g., Francis Marion, Bienville, Oconee, Croatan, Uwharrie) and many are in the 100,000-200,000 ha range. Although you state that it is possible to establish additional points, this will increase the cost of implementation as well as additional statistical consideration. Since it is likely that funds, if available, will be distributed based on acreage, the need for smaller forests to densify the grid will result in disproportionate costs for these smaller forests.

1, 2 The only way that I can envision this plan actually being implemented is for top managers to require that all NFs put this plan into operation by a given date. Is the WO willing to require implementation? Without establishing implementation of this protocol as a top priority, the many other demands and responsibilities of national forest biologists will likely take precedence. the funds must be made available and set aside for implementation of the MSIM protocol--and the MSIM protocol only. I suspect that each forest will have to hire several crews or contract the work out. To have good continuity from year to year, hiring or contracting should be done as earlier in the fiscal year as possible. Further, it is likely that each region will have to have one person devoted to administering this monitoring plan. I am sure that the developers of this plan have thought of all these things – it is just not clear whether they have been dealt with.

RESPONSE

PM: Unfortunately, small Forests have a challenge monitoring their populations regardless of the monitoring approach. Similarly, species with limited ranges, specialized habitat associations, or low detectability are also challenging no matter how large the Forest. This has probably already been done, but a strategic evaluation of how to most efficiently monitor all vertebrates of the southern forests would be informative. A key question would be a frequency distribution of the area on NFS lands within the geographic ranges of all species - this combined with suitable habitat and estimate of probability of detection can be used to estimate sample size requirements and the resulting sample point densities required to monitor change in each species. This would seem to be basic information needed to evaluate the potential success of any monitoring program, including MSIM. As for the allocation of funds, I think the needs of the Regions would be considered in allocations, not just acres. Region 10 also has unique challenges that would need to be considered in funding allocations.

PM: Good observations, and they are emphasized in the protocol.

Chapter	ISSUE OR COMMENT
5, 6, 7	<p>1. I strongly suggest that pitfall trapping be included in the core methods. For example, a 5-year monitoring project in 35 sites (5 reps of 7 habitat types) was recently completed at the Savannah River Site, South Carolina by Amanda Peck and Craig Allen. They had >100,000 Sherman trap nights and >11,000 pitfall trap nights. Approximately 90% of their shrew captures were in pitfall traps. Further, only one of the three species of shrews was captured in Shermans. Two other species, the harvest mouse and pine vole, were also only captured in pitfalls. I would also argue that for southeastern mammals, Mosby wooden box traps are far more effective than Tomahawks for capturing the sciurids (gray squirrel and fox squirrel) as well as the rabbits. We commonly catch these species in our box traps but Peck and Allen never caught any in their Tomahawks. I also strongly suggest placing some Sherman traps in trees. Flying squirrels are highly trappable if Sherman traps placed at 1.5 m; thus, it is not necessary to place them at every station. But, flying squirrels have very low detectability when only ground traps are used. Further, tree traps will increase the detectability of golden mice and some <i>Peromyscus</i> spp. where two species co-occur and there is spatial partitioning. 3. Other adjustments to be made for trapping in the south include timing and baits. Reproduction in a number of rodents occurs in late winter or early spring. Thus, these periods are the most productive in terms of trappability. The use of peanut butter baits in ground traps in areas where there are fire ants is deadly. Sunflower seed or oat baits are the best. Peanut butter in tree traps is okay. [there is more on these same topics]</p>
Other	<p>I think that the overall concept and approach of the MSIM is excellent and I would love to see this program implemented because of the wealth of data that would be obtained. Further, if this program is actually implemented, I would like very much to part of it.</p>

RESPONSE

m3: Secondary Methods covers the additional use of pitfall traps and their effectiveness at detecting shrews. We felt we should not include pitfall traps as a primary method because of the mortality rates, particularly for shrews. They are certainly an effective method for sampling, and for reptiles they are likely to be the most effective and are typically non-lethal. As a monitoring tool, we felt they carried too much mortality risk to be primary. We did recommend the placement of traps in trees under Secondary Methods. We did not recommend wooden box traps because we thought they would be prohibitively cumbersome and heavy to transport to such remote locations relative to metal collapsible traps.

SRS – Rudolph

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
1, 2		<p>I have serious concerns about the use of FIA points as the sampling scheme. In forests with limited roads, access will be difficult. I think of reaching a point across several km of dense chaparral on steep slopes without roads or trails. Just getting there, much less transporting a box of traps is daunting. What does this buy us, compared to selected points in the relevant habitat types that are relatively easily accessible? I suspect the answer is a false sense of sampling rigor.</p>	<p>PM: The same reason that FIA is based on a random or systematic sampling frame is also the rationale for wildlife populations and habitats - 1) it does not require preconceived notions of what strata are important and where they are located, and 2) it does not carry any other biases that might be associated with subjective selections, such as those with ready access. These safeguards are important for multiple reasons - first, habitat is defined differently for every species, so we would have to stratify by very broad features (vegetation series, ecoregions, life zones) and map them impeccably, and second, habitat at a point can change states, even if it is defined as broadly as a life zone, which is highly problematic when calculating change. Sites that are readily accessed are not likely to be representative of the overall landscape precisely because they are accessible.</p>
	cont.		<p>So, it is critical that sample points represent the array of conditions across the landscape, and for monitoring, we need them to either represent these conditions in proportion to their occurrence (which random or systematic should accomplish) or we need to be able to weight the sample so that we can make inferences about conditions across the landscape (weighting be dependent upon our ability to accurately and consistently quantify strata in the landscape).</p>

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
1, 2		The protocols suggested, even limited to the “primary methods” for each taxonomic group are far beyond the capability of the USFS. Permanent staff with the required expertise are not available, consequently this work will most likely need to be done by a shifting cadre of seasonal hires. Consistent funding will be a critical issue. I have not seen examples to date that convince me that this is likely to occur without substantial reorganization. I base this conclusion, in part, on the following observations [basically that funding for quality monitoring will not materialize]	PM: Certainly, it is not reasonable to expect the existing workforce to conduct monitoring if: 1) it is not currently being conducted, 2) there is no new money, and 3) priorities are not shifted. Many obstacles need to be cleared to successfully implement plant and animal monitoring on NFS lands, one of which is the availability of reliable, repeatable, standardized methods. The MSIM protocol is intended to address that obstacle. Regardless of funding, it is likely that seasonal employees will conduct the majority of field work. We changed the sampling design to be more robust to shifting sample sizes as a function of funding.
8, 9	3911-3912	The following comments on Chapter 8 highlight some of my specific questions and concerns with this chapter. I have similar concerns with other chapters, but do not have time to address them in detail. 1. I was confused. Are the Visual Encounter Surveys restricted to amphibians and reptiles? The text seems to include other taxa. 2. Is the goal of the surveys to maximize the number of species detected, or to maximize the number of vertebrate detections? Very different search strategies would be involved depending on the answer to this question. 3. Substantial modification of procedures will be required in different geographical areas. Many amphibians are surface active only during winter or early spring in some areas, numerous amphibians and reptiles are nocturnal, 1000 – 1800 hours is not the active time of many amphibians and reptiles. Specific direction is not given as to how to resolve these and other similar issues. On lines 3911-3912 it was not clear if 2 or 6 surveys were to be conducted per year.	PM: Most of these concerns were addressed by changes in the text. Bird and mammal detections were relegated to a summer VES survey. The goal of the surveys is to maximize the number of species detected. We attempted to clarify what aspects of the protocol were flexible so that regions could design the methods to be most effective in their areas. The ARVES protocol targets spring and fall sampling, and the times of day are now flexible. Regional plans must be developed and the basis for the specifics of the ARVES method documented in it. We changed the protocol to be two visits per season, for a total 4 visits per year.

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
8, 9	3916-3918	4. The sentence on lines 3916-3918 is unusual. It seems to suggest that only a portion of the 10 ha plot will be covered in a given survey. If so should the plot be reduced so that it can be adequately covered on each survey? 5. A total of 4 person hrs at a site will fail to detect 60-90% of the species present on West Gulf Coastal Plain sites, and probably similarly high percentages in many other regions. Snakes, salamanders, and hylid frogs will be particularly poorly sampled. The same few common and easily detectable species will tend to be recorded. Those species of current conservation concern will, by and large, be absent from essentially all surveys. I do not see how these data will help identify species of conservation concern.	PM: We doubled the survey time per visit so that it can be adequately covered, and we specified transects along which observers will walk to better standardize data collection among visits and years. It recommended that a secondary protocol be coupled with the ARVES protocol, in addition to the AQVES, but the addition will depend on which species are missed with each of these two methods. This should improve the detection of a greater proportion of species of concern and all species.
10, 11		I also briefly looked at Chapter 10: Plant Species Composition Monitoring. It will be extremely difficult to maintain crews with the required botanical skills to identify all plants. In particular, the number of individuals (several hundred?) with the ability to identify grasses, sedges, and rushes (many only in vegetative condition) will simply not be available. This will be especially difficult to accomplish in some western forests that include very different habitats, i.e. the Los Padres in CA that includes coastal, chaparral, coniferous and desert habitats.	PM: The plant species identification requirements in chapter 10 are the same as those for phase 3 FIA, and those data are currently collected at a subset of FIA points. The same set of experts could be tapped to conduct data collection and/or identify difficult to identify plants. It is likely that innovative solutions will arise in the implementation - particularly promising is partnerships with the States and Universities in terms of taxonomic expertise. It is also likely that, as with any study, there will be a number of unknowns, but the data that are generated on the species that are identified will be magnitudes greater than what we currently have in hand.

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
Other		<p>A general comment concerns the best use of limited resources. On the West Gulf Coastal Plain, and I assume elsewhere, the critical issue is not identifying the species of concern. It is providing effective management for the species already identified. I am concerned that this protocol will exhaust the resources that would be better spent improving, or even initiating management for the numerous species already known to be at risk. Management of many species and habitats is currently inadequate placing them at risk, and the resources do not seem to be available to rectify this situation. This protocol is unlikely to improve the situation.</p>	<p>PM: If no additional money is allocated to monitoring, then neither investment is an option. The funding for monitoring and management are separate in NFS. The cost of this monitoring effort is not so high that it would impact funding for management, however it is likely to affect monitoring activities.</p>

SRS – Thill

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
1, 2		<p>While there are some excellent experimental design reasons (more or less random location, good coverage of each forest, etc.) for using existing FIA plots (plus additional plots as needed for specific taxa), the distribution of these points will make this approach very costly. For example, each person involved will likely require GPS equipment (or very good maps, w/ frequently maintained paths) to locate all these points. While we were able to complete 25-28 breeding bird point-count surveys in one morning (sunrise to 1030) in our Arkansas EM surveys, I suspect it will difficult to complete more than 3-4 breeding bird point-count surveys in a morning (due to all the driving and walking required) using FIA plots. Also, In the South, most of our TES species tend to be concentrated in unique habitats (such as hillside bogs or frequently burned, mature longleaf pine forests) and specific successional stages (e.g., prairie warbles in young pine plantations).</p>	<p>PM: It is true that plots will take some time to access, but there is no way around it if we want points to represent the landscape - they need to be located throughout the landscape, regardless of convenience. The time required to access points is why point counts are 10 min (as opposed to a shorter duration), and why it is recommended to sample 7 stations as opposed to 4 per visit. The stations are 200 m apart in an array around the point. TES species are not the primary target of the MSIM protocol, but rather a breadth of species, including species of concern. Additional efforts directed at TES species will be required to fill-out monitoring objectives where MSIM falls short relative to species or sample sizes for monitoring TES species.</p>
	cont.	<p>Using FIA plots to monitor trends in these species would be a waste of precious resources - concentrating our efforts where the probability of locating these species of conservation concern is the best use of biologists' time and \$\$.</p>	

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
1	298 (1)	<p>Before this approach is adopted nationally, it needs to be rigorously tested under a range of ecological conditions. Manley et al. (2004) suggests (pg. 1, line 298) that this approach might be suitable for the Sierra Nevada ecoregion, but their approach (based entirely on computer simulation) indicated that 67%, of rare species, 76% of endemics, and 53% of the species of concern, respectively, were not adequately detected. These are the very species that are currently of most concern to NFS! One must question the appropriateness of a very expensive monitoring system that can't adequately detect > two-thirds of the rare and endemic species and more than half the species of conservation concern. Furthermore, NFS line officer should be provided cost estimates to go along with these test results.</p>	<p>PM: Pilot implementation of the MSIM protocol in a range of ecological conditions would be an ideal next step. In terms of the predictions of Manley et al. (2004), it is just as important to look at what can be accomplished - population status and change data for 38 rare species, 15 endemics, and 18 species of concern - this outstrips current accomplishments by far in the Sierra Nevada. Evaluations of how best to engineer the MSIM protocol for each region would provide a similar backdrop of information with which to decide how best to meeting monitoring information needs.</p>
1	(3-4)	<p>If habitat data were being collected at the FIA plots each year and the FIA crews could be trained to collect all the data needed for all the wildlife (and other) multiple use surveys, this would be a major advantage to using FIA plots. However, even with full funding, it's my understanding that FIA plots will only be re-surveyed every 5 years. For many species, this would not be often enough relative to the ancillary benefits outlined on pages 3-4. Furthermore, wildlife biologists would generally need habitat data collected during the growing season. FIA surveys during the non-growing season may or may not be suitable depending on species of concern. Later on you indicate that the wildlife plots will not be superimposed over the FIA plots. Thus, much of the data that the FIA crews collect will be of limited value for our purposes.</p>	<p>PM: FIA data on a 5 year periodicity is likely to be sufficient to meet habitat monitoring needs. FIA crews can be contracted to collect additional data at sites - the cost of contracting with FIA would need to be compared with the cost of additional field crew members on MSIM crews to collect the data. For the first sample period for MSIM we recommend that habitat data also be collected (center and remote sampling locations) so that habitat relationship models can be built. In subsequent sample periods, it is likely that data only need to be collected at the center point and this may be accomplished by FIA crews. The ability of data collected by FIA to meet plant monitoring needs would definitely be affected by the time of year data are collected, but it is not likely to impact habitat data for most wildlife species. It would be ideal for MSIM sites to have habitat measurements taken in the summer so that herbaceous plants are well represented in the sample. FIA plots are located in the hexagon of the MSIM sampling, so they are co-located in that manner.</p>

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
1	793-794 (13)	I'd suggest that these protocols be thoroughly tested and tweaked in several different ecoregions across the U.S. before being fully implemented. Then the draft technical guide can become the final technical guide. Let's not be changing the guide and its protocols annually for the first 3-5 years! That's a recipe for failure.	PM: It is unlikely that every Region will implement the MSIM protocol in the first 5 years, but you are right, careful attention needs to be paid to the pace and oversight of implementation and associated learning. We attempted to emphasize this in the protocol.
1	(14, 17)	There has apparently been a field trial of this approach (Manley and Roth 2004), but this citation was not listed in the literature citations (pg. 14). Did this test validate the suitability of this approach given the re-sampling frequency suggested in Table 2.1 (pg. 17)? If not, these test results may not be applicable.	PM: The reference was added to the literature cited, and it was a field test of the protocol at the Forest scale that were used to evaluate performance at Forest and ecoregional scales. In the revision of the protocol, we changed the sampling design to emphasize change (vs. trend) and thus the results of Manley et al. (2004) and evaluations of the field test are more directly applicable to the expected outcomes of the MSIM protocol. We changed them to make the design more robust to fluctuating funding and sample sizes, and to emphasize near-term information gains.
2	1157 (23)	Since moving 100 m from the FIA plot could put the MSIM plot in a different habitat type, I again fail to see why these protocols call for using the FIA points. Why not use a stratified sampling approach where the plots are just far enough off 2-wheel drive accessible roads so that the impacts of roads (noise, mortality, etc.) aren't impacting the results. I'm not sure what this distance might be, but Craig Rudolph's snake data suggest that this distance may be 400-500 m or more. This would greatly increase the number of sampling points that could be inventoried per unit time and negate the need for 4-wheel drive vehicles, etc.	PM: MSIM sampling encompasses a minimum of a 10 ha area, and the FIA point will always occur in the 10 ha sample area. [the remainder is a repeat of response to same question by Rudolf of SRS] The same reason that FIA is based on a random or systematic sampling frame is also the rationale for wildlife populations and habitats - 1) it does not require preconceived notions of what strata are important and where they are located, and 2) it does not carry any other biases that might be associated with subjective selections, such as those with ready access. These safeguards are important for multiple reasons - first, habitat is defined differently for every species, so we would have to stratify by very broad features (vegetation series, ecoregions, life zones) and map them impeccably, and second, habitat at a point can change states, even if it is defined as broadly as a life zone, which is highly problematic when calculating change. Sites that are readily accessed are not likely to be representative of the overall landscape precisely because they are accessible.

Chapter	LINE (PAGE) cont.	ISSUE OR COMMENT	RESPONSE
3, 4	1941	<p>(1) Indicates that only one FIA plot will likely be surveyed per morning. That's makes these data very expensive. Given the narrow temporal window (4-5 weeks here) suitable for bird surveys (for example), this would necessitate more than one biologist/district to complete just the bird surveys within this window. (2) In the southeastern U.S. each breeding bird surveyor would likely also need a 4-wheel drive vehicle (not currently available on most R8 districts and/or ATVs) to get within a reasonable walking distance of many of these points. (3) Climatic conditions in the South (long growing season, abundant rainfall, etc.) typically make it necessary to re-brush paths to permanent sampling plots every couple of years if the route to points goes through early succession habitat. So, plot maintenance will be a major undertaking requiring additional personnel and funding—at least is the Southeastern U.S. I don't recall seeing any discussion on plot maintenance--nor plot monmumentation for that matter.</p>	<p>So, it is critical that sample points represent the array of conditions across the landscape, and for monitoring, we need them to either represent these conditions in proportion to their occurrence (which random or systematic should accomplish) or we need to be able to weight the sample so that we can make inferences about conditions across the landscape (weighting be dependent upon our ability to accurately and consistently quantify strata in the landscape).</p> <p>PM: (1) Completing a survey at 4 point count stations requires 1 hr 20 min - travel time between points needs to be < 1 hr to survey two points in one morning. In heavily roaded areas, two points will be possible. Given the large number of observers and observer variability associated with large-scale monitoring, we did not want to shorten the count period - the only option for shortening survey time. As mentioned in the survey protocol, it is unadvisable for single observers to be assigned to a geographic area - observers should be rotated among areas. It is also unlikely that district biologists will have time to conduct the monitoring themselves. At the scale of a typical district (250,000 ac) a minimum of 8 monitoring points will need to be surveyed each year of the sample period. This equates to a half-time job for one person for 6 weeks to conduct point count surveys. Some of the other primary survey methods, if implemented, overlap the point count sampling period (amphibian and reptile visual encounter surveys, nocturnal broadcast surveys). Seasonal employees are probably the best option for collecting monitoring data. (2) If 4-wheel drives are required and not available in the fleet, they can be rented - we did not address this in the text. (3) Plots are only expected to be visited once every 4 to 7 years - it is not advisable to keep routes to plots open - it is better that they are not readily identifiable and that the environment remains unaltered to the extent possible.</p>

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
3, 4	1977-1980	I'd suggest you specify appropriate dates by latitude to standardize sampling dates w/in each zone. If you leave this to the discretion of busy district biologists, they may be forced by other commitments to begin too early or cease too late.	PM: This is a good idea - we suggested that each Region do this, since we did not have the time and information to do this justice in the protocol.
3, 4	2034-2035	My experience suggests that it's unlikely you'll find hundreds of bird experts that also can conduct your other surveys. I'm assuming NFS would staff these positions with summer students. What will these folks do after they've completed their bird surveys if they can't survey other taxonomic groups?	PM: It is also our experience that these positions will be staffed with students or recent graduates. The timing works fairly well to start small mammal trapping after point counts are completed, and it is reasonable to train most biologists to handle and identify small mammals within a few weeks. If they are not interested in other sampling taxa, then they work a short season.
3, 4	2051-2052	In the South we typically have roughly a 5- to 6-week window within which to complete breeding bird surveys—not 3 months.	PM: Our mistake - a typo in the text - it is 6 weeks just about everywhere.
3, 4	2065	We've utilized college student to conduct many of our surveys. Due to class schedules, they typically can't begin until about the middle of May. Our survey window is typically from mid-May to mid June. Consequently, R8 won't have 2-3 weeks to train summer bird survey personnel.	PM: Two weeks is sufficient to train individuals that already have birding experience. If most field personnel are truly not available until the breeding season begins, then more individuals will need to be hired for a shorter period of time - not ideal, but workable. Bottom line is that if you want to sample breeding birds, they need to be surveyed in the breeding season.
5, 6, 7		[numerous helpful suggestions on improving small mammal trapping protocol]	M3: Suggestions were incorporated into the small mammal chapter.

Non-FS: IAFWA – Baughman

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
5		Sherman traps - More flexibility in baiting strategies should be considered. Perhaps a suite of baits could be recommended.	PM: Good suggestion - we made the bait more generic.
6	(68)	Skunk-based lures are not an especially good generic distance attractant for meso-predators in summer. Other generic lures may have more usefulness (e.g., Carmine's Canine Call, Fatty Acid Scent). The utility of various lures, and the quantities needed for effectiveness vary with season, humidity, and geographic location. Ten day survey periods, especially for camera traps are too short. Many predators will exhibit neophobia towards these devices (or other capture systems). One method of improving capture success might be to place devices a few weeks before the survey is conducted. These are important details that will influence how successfully animals are detected. There is good evidence that coyotes and possibly other medium sized predators are camera shy, depending on social status, and whether the camera is placed inside or outside of territories.	BZ: Good point regarding lures. Document will be altered to provide more flexibility in use of lures that local conventional wisdom suggests are best, or a combination of lures if the efficacy of any one is unknown. Survey duration is a compromise to accommodate the combination of a number of protocols and the already high cost of this protocol per monitoring point. Certainly a mesopredator-only protocol would (and does) call for longer survey durations (16 days). We listed extended survey periods as a fruitful augmentation in the secondary survey methods section, as well as the potential of establishing the devices for some period prior to them being activated (both of which add cost and effectiveness).
6		Generally, much larger quantities of lure are needed east of the Mississippi and lure needs to be applied more frequently. It might be useful to consult with local experts to insure that the best possible formulation is being employed.	M3: In southern Cascades and northern Sierra used 2-3 Tablespoons to last duration; mixture is messy to work with so applying once is desirable. We mention that application procedures may vary geographically and to consult local experts.
6		Also, it is not stated how often capture systems will be baited nor how often they will be visited.	M3: Line 3042: trackplate bait will be replaced every visit. Line 3079: camera bait will be replaced when absent or deemed necessary. Line 3017: stations visited every other day during 10 day survey period.

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
7		<p>Bats - The authors suggest that rotating observers among sites would decrease the probability of placing a mist net in an unsuccessful location. Wouldn't prior knowledge have the opposite effect? Survey crews will search for bats under bridges and in other locations close to roads. As previously mentioned in reference to Chapter 3, many or most PSUs are distant from roads. Will bat surveys use a different subset of PSUs than other surveys? More broadly, will different PSUs be exploited for each survey? This possibility (not implied in other chapters) raises important concerns about using data for evaluation of species compositions.</p>	<p>M3: During the pilot and implementation phases of the bat survey protocol (2001-2002) and the subsequent two years of similar bat surveys, we found both possible scenarios to be true. While it is true that a very productive net during survey 1 was, when placed in the same location for survey 2, again productive, the converse was also true. Other researchers have also reported that just changing the angle of a net in a pond resulted in greater captures. Therefore, we feel that different individuals' assessment of the best net placement may in the end be less biased and more advantageous. Temporal variation in bats is well known; if surveys occur in an area with multiple high quality bat foraging and drinking sites, the chances of the bats being at the same site as the observer on any given night lessen. The result is that a previously unsuccessful net or site then becomes successful. The bottom line: it is difficult to know whether the variation of captures between nets and between surveys is due to net placement or that the local bats are dining elsewhere for the night.</p>
	cont.		<p>We changed the site selection criteria so that it is now the closest suitable sample site to the monitoring point, and the bat sample sites will also be used to sample aquatic vertebrates. These adjustments should improve the spatial coincidence of survey data for different taxonomic groups.</p>

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
	8	The authors indicate that visual encounter surveys are the method of choice for reptiles, and imply that this method will be the method of choice for surveys of other species. This does not appear to be true, and again suggests a broad need for greater integration among chapters. One possibility that might improve the clarity of the document is the inclusion of a series of summary tables that list primary and secondary methods, survey frequencies, personnel, etc., possibly along the lines of Table 2.3. The authors attempt to relate their use of visual encounter surveys to the use of this method in other surveys. This attempt is commendable and suggests a strategy that could be implemented in other chapters (under this heading and other headings) to increase integration and improve utility.	PM: Good suggestion - made a table to that effect.
	10	Only Chapter 10 specifically mentions recording invasive species. It might be worthwhile to consider the collection of invasive species information (as well as information of possible relevance to wildlife disease monitoring) in each of the protocols.	PM: Good suggestion.
General		The draft plan recognizes that substantial training is a prerequisite for the effective implementation of each sampling protocol. State wildlife personnel are expert in the collection of data for many of the species discussed in the plan and are familiar with many of the habitats. One way to reduce sampling costs might be to work closely with state agency personnel (and experts in other agencies and non-governmental organizations).	PM: That would be ideal, certainly.

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
Other		<p>While each of the monitoring schemes (chapters) is internally complete, there is a need for more organizational integration among monitoring schemes. Greater integration would increase the power of the document, and possibly remedy difficulties that may arise during sampling. For example, although authors take care to minimize the environmental impacts of survey methods, the overall number of investigators visiting each PSU to conduct surveys is large (30-45 people/one sampling cycle in each 300 ha PSU). There may be instances when the same crew can collect data for multiple inventories and thus decrease visitation impacts. There is also the possibility that without more coordination, the activities of different sampling crews will conflict with one another.</p>	<p>PM: Coordination among sampling efforts is important. We attempted to provide more guidance on how to coordinate among methods. Sampling is spread over a lengthy time period, so only a few protocols overlap in time.</p>

Non-FS: IAFWA – Conant

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
1, 2	(3)	<p>With a portion of the monitoring protocols optional, it will be difficult to conduct large-scale or national analyses on specific species or habitat types. The data will likely only allow meaningful analyses to be conducted at the Forest or Regional level. In addition, with possible national and regional variations, it is unclear if the benefit of "...enhances the feasibility of range-wide monitoring of hundreds of species and their habitat" (page 3, first bullet, second sentence) will be achievable. This question of regional variation needs to be addressed before the question "throughout their range" (Section 2.2.1) can be achieved. This paragraph includes the example for the Sierra Nevada ecoregion and states "it is expected that if all MSIM primary protocols were conducted at each FIA grid point." It is unclear if this statement is referring to only the FIA grid points that are on NFS land or all grid points. This should be clarified.</p>	<p>PM: The majority of species are detected by the core primary protocols, and if every Region implemented MSIM, the result would be nation-wide data on the status, distribution, and ultimately change in populations of an estimated 40% of all vertebrates on NFS lands. Variations in the methods are directed at optional or additional elements only, such that the fundamental elements of the method can be extracted from the data set to obtain a consistent data sets across Regions. For example, point counts specify 4 stations and 3 visits - Regions may choose to count additional stations or conduct additional visits, but the data set can be subset to obtain the 4 stations and 3 visits. As for National coverage, Region's are not obligated to implement MSIM, so implementation could range from none to all Regions. In addition, the protocol could be implemented fruitfully on all land ownerships, but is directed at NFS lands and all references to sampling design, including what proportion of FIA points will be sampled, pertain to recommendations for NFS lands. We attempted to clarify in text.</p>

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
1, 2		<p>If implementing MSIM by the Forest Service is going to be limited to NFS lands, then the guide should discuss partnering opportunities with other research entities (Federal, State, and non-governmental) to help fill in the gaps on collecting data from private and other public land. It might be beneficial to discuss the draft guide with the National Association of State Foresters and the International Association of Fish and Wildlife Agencies, and to possibly develop a strategy with them to address the state and private forest land components. The State Foresters will be very interested to understand if MSIM will reduce or delay the collection and analysis of the standard FIA data. It might also be a good idea to make sure that MSIM is consistent with the Memorandum of Understanding between the Forest Service and NASF regarding FIA.</p>	<p>PM: Good suggestions. An MOU for implementation of the MSIM protocol has been created and it is consistent with the NASF MOU.</p>
Other		<p>introduces the term “management indicatory species (MIS)” but does not include a definition or a reference explaining that term.</p>	<p>PM: The emphasis was shifted to target species of interest to be more generic and extend the shelf life of the protocol.</p>

Non-FS: VA DFG - Cooper

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
3	1941	Pg 43, Ln 1941 mentions that typically only a single sampling station can be completed in one morning. In more remote and high elevational habitats that is an accurate statement. However, an observer should, in most instances, be able to complete 2 stations per morning, particularly if roads and trails are used strategically and sampling is cluster by habitat strata.	PM: Sampling points are randomly located every 6000 ac (highest density), so they will not be clustered or stratified by habitat type. So, sometimes points that are close together will also be near roads, in which case two points will be possible. The count period per morning is about 4 hrs, and it takes approx. 1 hr 20 min to complete four count stations - two monitoring points require about 3 hours to complete, so travel time between monitoring points needs to be < 1 hour to survey two monitoring points in one morning. We mention this, and suggest that the additional time per morning can be allocated to counting additional count stations per point or two points (when possible).
3	2236	re: to visual encounter surveys for diurnal breeding raptors. This method is ok but does not give any good estimates of breeding species abundance and in many cases species occurrence. The best method for most diurnal breeding species of raptors is to use conspecific call-back survey methods (similar to what is described in the nocturnal avian method in chapter 4). There is a great body of literature on this method.	PM: We mention call-back methods in secondary survey methods, but do not provide a lot of detail because call-back methods can only survey a few species at a time, which is beyond the scope of the multiple species protocol.

Non-FS: VA DFG Graham

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
1	774 (12)	"concerve" replaced with "conserve"	M3: Done
2		<p>The objective of inventorying and monitoring species of concern is not well-served by the FIA Grid System. The FIA plots provide an excellent opportunity to identify patters and trends that are statistically valid, but they are not meant for finding and monitoring rare species or communities. To find and monitor rare species/communities, a targeted approach is needed. For example, one of the most important communities on USFS land in Virginia are the high-elevation spruce-fir forests. Because these are relatively rare, they probably won't turn up on more than 1 FIA plot. However, there are probably hundreds of FIA plots in more common community types, such as chestnut oak, that are of limited biodiversity value. Species of interest don't appear to include state endangered or threatened species. If surveys included state-listed species, it would make these data much more valuable to state wildlife agency partners.</p> <p>cont. In fact, no where in this document are state wildlife agencies mentioned as partners in this effort. In Virginia, VDGIF manages much more terrestrial wildlife data than the Heritage program and would be an ideal partner (as would Heritage) for faunal surveys and data collection standard-setting.</p>	<p>PM: Species of interest are variously defined by Regions and Forests, but they typically include state listed species. Methods do not target specific species, but based on pilot work conducted in the west, species of interest are just as readily detected as species without special designations - in other words, species of interest are not necessarily rare or difficult to detect. It is the obligation of the NFS to know the status and change of natural resources on its lands, regardless of their biological diversity. However, certainly rare communities and species are of interest and for those that are inadequately sampled by MSIM and are a high priority, it is recommended that MSIM plots be augmented by additional sample points to increase the sample size for these elements.</p> <p>The minimum sampling intensity specifies 50% of the grid - this is intended to provide Forests and Regions with low density grid on which to build additional sampling to meet local needs, such as additional sampling in rare types. States certainly are strong partners - we added states as partners in the document - our oversight.</p>

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
7	3508- 3509 (81)	Suggests that each site be surveyed on 2 separate occasions. John Hayes of Oregon wrote a paper in which he looked at temporal variation using bat detectors and found that over streams in Oregon, you should sample a min of 6 nights. Perhaps the different forests should conduct similar temporal studies to determine how many times a site should be visited	<p>M3: We conducted a pilot study in 2001 to determine how many surveys it would take to describe the bat community associated with a monitoring point. Based on Hayes 1997 (the paper you mention) we expected to be surveying sites 6 times at most, as our objectives (maximizing number of species detected at a monitoring point) were different from his (describing temporal variation in bat activity over streams). We found that even after 6 surveys to only 1 of 3 sites associated with a monitoring point we were still adding a new species, although after 3 surveys the accumulation of species dropped dramatically. We refined our method in 2002 to 3 sites per monitoring point surveyed twice (for a total of 6 surveys/monitoring point), then randomly selected several sites to be surveyed 4 times for the purpose of improving our probability of detection estimates. What we found after analyzing these two years of data (besides being very expensive!) was that the most efficient combination was 3 sites, 2 surveys each; that second survey increased species detections by 9%.</p>
	Cont.		<p>We then calculated the probability of detection, and with two visits, it exceeded 80% for the 9 species we detected. Thus, we settled on two visits per site and if resources allowed to visit more sites to provide the greatest resolution in the distribution and change in occupancy of bat species at the Forest and ecoregional scales.</p>

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
7	3528-3529 (81)	Most bat researchers will not net when temperatures reach the low 50's F. This will probably not be an issue in most areas, but if you are netting at a higher elevation, or early in the season, it could be. We recommend setting a minimum temperature.	M3: In addition to the 2001-2002 studies above, we have conducted surveys in the Pacific Northwest for the past two years. We feel we have been to some of the coolest places during the summer months (Sierra Nevada mountains, Oregon coast) and have found no correlation between number of species captured and minimum survey temperatures. In 2002, when surveys were focused in the Sierra's, 64% of total captures occurred between the temperatures of 46-55 F. In fact some of the coldest nights yielded the most species per survey, although individual numbers were low (typical at higher elevations)
7	3531 (81)	We recommend that you add the following to this section: number and size of nets used (helps to quantify effort); opening time and closing time for nets (ditto); mass (helps with identification, esp. after the fact)	M3: We agree with your suggestion of noting net size and number, as well as net open and close times (although survey duration is set at 3.5 hours). These items are included on our mist net survey data form, and we will be posting example data forms at the MSIM website. With regards to mass: although this is a standard morphological measurement we find it is unnecessary for these types of surveys (monitoring). Further, bats can consume a significant proportion of their body weight in insects per night, resulting in vastly different weights for the same bat between dusk/emergence and several hours later. In northern California there are no bats that require weight for determining a species identification. We have added to the protocol the necessity of consulting a local bat biologist for a key to identifying bats to determine if weight is needed. Although minimal, not weighing individuals can save time and money.

Chapter	LINE (PAGE)	ISSUE OR COMMENT	RESPONSE
10, 11		<p>We recommend that the MSIM use a standard vegetation classification system. This is absolutely critical to effect monitoring efforts. The document here mentions using either NVCS or SAF types. These are vastly different systems with different purposes. MSIM needs a standard system with standard categories and guidelines for identifying categories. This is another area of potential coordination with state partners, such as the state wildlife agency, the Dept. of Forestry, and the Heritage Program. In Virginia, the VDGIF will be pursuing development of a standard habitat classification for fish and wildlife resource management. We urge caution in stating that GIS data will be available for the entire continental U.S. This document specifically mentions vegetation and precipitation data. These data sets may not be of consistent quality and availability for all parts of the U.S.</p>	<p>PM: We identified one classification system that could be used throughout the country and for which cross-walks are commonly created. However, other or multiple schemes could be used. Most Forests and Regions use local classification schemes that have high resolution in terms of the description and ecological interpretation of ecotypes. In the course of implementation, other options for national classification schemes can be evaluated and a different choice adopted if deemed superior.</p>
General		<p>We recommend that the document mention how natural resource partners, particularly at the state level, could be involved in or coordinated with regarding the inventory and monitoring efforts. We recommend that the document mention of the Comprehensive Wildlife Conservation Strategies (CWCS), mandated by State Wildlife Grant funding, that all state wildlife agencies must complete by October 2005. The purpose of these strategies is to identify species of greatest conservation need, their habitats, threats to these species and habitats, and strategies for their conservation. The MSIM could be a valuable tool for states to use to monitor trends and threats. Feel free to contact me for more information about the CWCS in Virginia as an example. We recommend that invasive species monitoring be mentioned in the document. Invasive species are a major concern and there are few coordinated efforts to monitor them.</p>	<p>PM: The Forest Service is very interested in working with the states and collaborating in meeting state's Comprehensive Wildlife Conservation Strategies, and it is likely that implementation of MSIM could contribute significantly to meeting state information needs in some states. Working closely with the states in implementing MSIM is clearly a priority for the USFS. Invasive species were not mentioned specifically. Certainly the plant monitoring protocols would detect invasive plants in areas they have established populations, and MSIM could serve as a foundation on which additional plant detection and monitoring is conducted that is focused specifically on invasive plants. However, MSIM plant monitoring alone is not likely to be an effective early warning monitoring system. For example, it should be augmented with survey efforts along corridors identified at the local level as the most probable routes along which species of concern are likely to move.</p>