



Evaluation Report

Feral Swine/Pseudorabies Working Group

April 27-29, 2009

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Executive Summary

Brief Synopsis of Event

This report is an evaluation of a NIMBioS Working Group entitled “Feral Swine/Pseudorabies in Great Smoky Mountains National Park,” which held its first meeting at NIMBioS April 27-29, 2009. NIMBioS Working Groups are chosen to focus on major scientific questions at the interface between biology and mathematics. NIMBioS is particularly interested in questions that integrate diverse fields, require synthesis at multiple scales, and/or make use of or require development of new mathematical/computational approaches. NIMBioS Working Groups are relatively small (10-15 participants), focus on a well-defined topic, and have well-defined goals and metrics of success. Working Groups will typically meet 2-3 times over a two-year period, with each meeting lasting 3-5 days; however, the number of participants, number of meetings, and duration of each meeting is flexible, depending on the needs and goals of the group.

The Feral Swine/Pseudorabies (FSP) group comprised 15 participants, including co-organizers Graham Hickling (NIMBioS), Suzanne Lenhart (NIMBioS), and Les Real (Emory University). Participants came from a variety of institutions, including the United States Department of Agriculture (USDA), Oak Ridge National Laboratory (ORNL), Great Smoky Mountains National Park (GSMNP), and several universities (See Appendix A).

The Working Group’s aim is to develop a modeling approach that could incorporate what is known about feral pig movement, interaction and pseudorabies virus (PRV) transmission with *what if* scenarios relating to available management options (culling, fencing, vaccination of adjacent livestock) that GSMNP managers could consider. Further, the modeling approaches adopted will aim to provide a sufficiently general framework to be a useful starting-point for similar problems in other parks and wildlife areas in later years. The intention is that the Working Group’s outputs be transferable to the greatest extent possible to other wildlife-livestock interface disease problems.

Evaluation Design

An electronic survey aligned to the following evaluation questions was designed by NIMBioS’ Evaluation Coordinator with input from the NIMBioS Director and Deputy Director:

1. Were participants satisfied with the Working Group overall?
2. Did the meeting meet participant expectations?
3. Do participants feel the Working Group made adequate progress toward its stated goals?
4. Do participants feel they gained knowledge about the main issues related to the research problem?
5. Do participants feel they gained a better understanding of the research across disciplines related to the Working Group’s research problem?

6. What impact do participants feel the Working Group will have on their future research?
7. Were participants satisfied with the accommodations offered by NIMBioS?
8. What changes in accommodations, group format, and/or content would participants like to see at future meetings?

The final instrument was hosted online via the University of Tennessee's secure online survey host mrlInterview. Links to the survey were sent to 12 Working Group participants (NIMBioS employees Suzanne Lenhart, Graham Hickling, and Agricola Odoi were not expected to participate in the evaluation) on April 29, 2009. Reminder emails were sent to non-responding participants on May 4 and May 8, 2009. By May 15, 2009, nine participants had given their feedback, for a response rate of 75%.

Highlights of Results

- Overall satisfaction with the Working Group was high among survey respondents, the majority of whom (89%) indicated they either agreed or strongly agreed that the Working Group was very productive and met their expectations.
- Almost all respondents (89%) thought the presentations were useful and that the presenters were very knowledgeable about their presentation topics (100%).
- Eight of nine respondents either agreed or strongly agreed that they would recommend participating in NIMBioS Working Groups to their colleagues.
- Overall, respondents reported being very satisfied with the travel, housing, and other amenities provided by NIMBioS.
- While the majority of respondents agreed that they had a better understanding of the main issues related to FSP, some participants indicated they either did not gain understanding, or felt “neutral” about the amount of understanding they gained on the topics.
- Several respondents said the multidisciplinary composition of the Working Group was its most useful aspect.
- All respondents agreed that the format of the Working Group was very effective for achieving its goals, and that the Working Group made adequate progress for the first meeting toward one of its goals: finding a common language across disciplines for FSP research.
- Seventy-eight percent of respondents felt the Working Group made adequate progress toward its goal of formulating an approach to control of pseudorabies in feral swine.
- One-hundred percent of respondents said they left this meeting with a good idea of what their contribution will be at the next meeting
- Several respondents said they planned to take the knowledge they gained during the Working Group and apply it to their own research.
- Four respondents reported they had developed solid plans for collaborative research with other Working Group participants, while others indicated they saw potential for collaboration in the future.

Conclusions and Recommendations

Overall, the Working Group was successful in making progress toward its goals. Working Group respondents were satisfied with the meeting, indicating that it was a productive experience that met their expectations. Respondents were also satisfied with the travel, housing, and other amenities offered by NIMBioS.

Respondents gained varying degrees of understanding about the issues surrounding the research problem of the Working Group. While the majority of respondents agreed that they had a better understanding of the main issues related to FSP, some indicated they either did not gain understanding, or felt “neutral” or about the amount of understanding they gained on certain topics.

The majority of respondents felt that adequate progress was made toward the goal of finding a common language across disciplines in FSP research, but that it would take several more meetings before the goals could be fully realized. Seventy-eight percent felt the Working Group made adequate progress toward its goal of formulating an approach to control of pseudorabies in feral swine, while 100% said they left this meeting with a good idea of what their contribution will be at the next meeting:

Several respondents indicated they planned to take the knowledge they gained during the Working Group and apply it to their own research. Four respondents reported they had developed solid plans for collaborative research with other Working Group participants, while others indicated they saw potential for collaboration in the future.

While most respondents could not think of ways to improve future meetings, several suggestions were offered, including inviting various other participants, incorporating a hike in the Smokies into the Working Group agenda, and getting out of the NIMBioS facility during the day for a group meal on campus.

Based on analysis of participant response data, the recommendations are as follows:

- The Working Group had a good multidisciplinary composition, but consider the request to invite someone from the TN or NC state government to discuss his or her concerns about FSP at the next meeting.
- Given that 22% of respondents indicated they did not learn enough about opportunities to generalize the outputs of this Working Group to disease problems in other wildlife/agriculture areas, consider emphasizing these ideas at the next meeting.
- While the suggestion to include a mandatory hike in the agenda is not feasible considering the potential variation in abilities of respondents, consider the feasibility of offering an optional organized hike for those interested.
- Consider the possibility of scheduling a group breakfast or lunch outside of the NIMBioS facility.

Feral Swine/Pseudorabies Working Group Evaluation Report

Background

Introduction

A Working Group entitled “Feral Swine/Pseudorabies in Great Smoky Mountains National Park,” met at NIMBioS April 27-29, 2009. The Feral Swine/Pseudorabies (FSP) group comprised 15 participants, including co-organizers Graham Hickling (NIMBioS), Suzanne Lenhart (NIMBioS), and Les Real (Emory University) (See Appendix A for a full listing of participants).

NIMBioS Working Groups are chosen to focus on major scientific questions at the interface between biology and mathematics. NIMBioS is particularly interested in questions that integrate diverse fields, require synthesis at multiple scales, and/or make use of or require development of new mathematical/computational approaches. NIMBioS Working Groups are relatively small (10-15 participants), focus on a well-defined topic, and have well-defined goals and metrics of success. Working Groups will typically meet 2-3 times over a two-year period, with each meeting lasting 3-5 days; however, the number of participants, number of meetings, and duration of each meeting is flexible, depending on the needs and goals of the group.

The FSP Working Group’s aim is to develop a modeling approach that could incorporate what is known about feral pig movement, interaction and pseudorabies virus (PRV) transmission with *what if* scenarios relating to available management options (culling, fencing, vaccination of adjacent livestock) that GSMNP managers could consider. Further, the modeling approaches adopted will aim to provide a sufficiently general framework to be a useful starting-point for similar problems in other parks and wildlife areas in later years. The intention is that the Working Group’s outputs be transferable to the greatest extent possible to other wildlife-livestock interface disease problems.

Working Group Background

A theme of particular interest to NIMBioS’ sponsoring agencies is the enhancement of capacity to analyze and manage outbreaks of disease among wild animals and domestic herds. To address this theme, the FSP Working Group will be working on the problem of managing pseudorabies virus (PRV) and other disease agents among feral swine within Great Smoky Mountains National Park (GSMNP).

Feral swine have been managed in GSMNP for many years in response to the habitat damage they cause – they are now a focus of increased attention since the detection in 2005 of individuals infected with PRV. Pseudorabies has almost certainly arrived in the Park as a consequence of hunters’ illegal releases of swine from quarantined states into either the Park or into the immediately adjacent National Forest land.

PRV is of great concern in North Carolina due to the large economic impact that would arise if swine exports from the state were quarantined as a consequence of spillover from feral swine from GSMNP. This situation provides a useful focus for our Working Group to address general issues of wildlife

population management tied to spatial disease spread, and determining the optimal balance of effort between surveillance and control activities.

The Working Group's aim is to develop a modeling approach that can incorporate what is known about feral pig movement, interaction and PRV transmission with *what if* scenarios relating to available management options (culling, fencing, vaccination of adjacent livestock) that park managers could consider. Further, the modeling approaches adopted will aim to provide a sufficiently general framework to be a useful starting-point for similar problems in other parks and wildlife areas in later years. The intention is that the Working Group's outputs be to the greatest extent possible transferable to other wildlife-livestock interface disease problems.

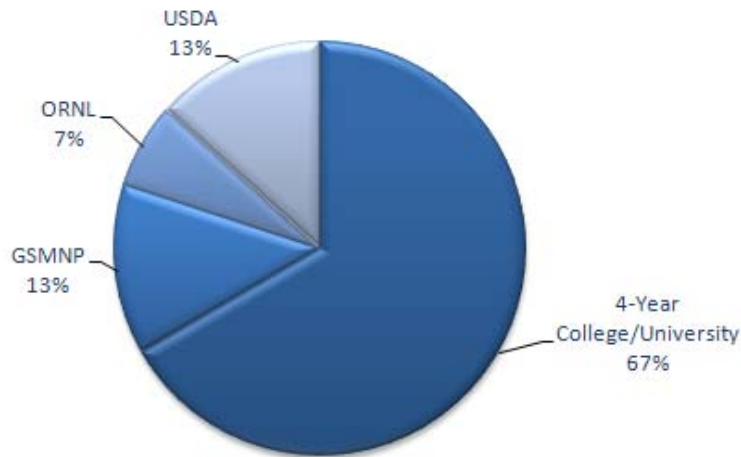
The extensive outreach opportunities to the general public provided by the National Park Service interpreters provide an opportunity to broaden public appreciation of the utility of these kinds of quantitative approaches in addressing issues of national concern related to natural system management. This Working Group also provides opportunities to strengthen connections with NIMBioS' formal partners, particularly Oak Ridge National Laboratory (ORNL), and GSMNP.

Participant Demographics

An electronic survey, which included optional demographic questions, was sent to 12 participants (NIMBioS employees Graham Hickling, Suzanne Lenhart, and Agricola Odoi were not expected to participate in the evaluation) to gather information about their perception of the Working Group. Of the eight males and one female responding to these questions, six self-identified as white, and one as black. Two respondents did not indicate a racial background. None of the respondents indicated being of Hispanic/Latino ethnicity.

Participants came from a variety of institutions, including the United States Department of Agriculture (USDA), ORNL, GSMNP, and several universities (Figure 1—note this figure includes all 15 Working Group participants, not just the 9 survey respondents). Participants were involved in several areas of research, including wildlife biology, immunology and epidemiology, and mathematical modeling (See Appendix C for a detailed listing).

Figure 1. Institutions of Working Group participants (n =15)



Evaluation Design

Evaluation Questions

The evaluation of the Working Group was both formative and summative in nature, in that the data collected from participants was intended to both gain feedback from participants about the quality of the current Working Group and also to inform future meetings. The evaluation framework was guided by Kirkpatrick's Four Levels of Evaluation model for training and learning programs (Kirkpatrick, 1994¹). The evaluation questions were developed according to level one of the model, participants' reactions, in order to gather information about how participants felt about the content and format of the Working Group, as well as the accommodations provided by NIMBioS. Several questions constituted the foundation for the evaluation:

1. Were participants satisfied with the Working Group overall?
2. Did the meeting meet participant expectations?
3. Do participants feel the Working Group made adequate progress toward its stated goals?
4. Do participants feel they gained knowledge about the main issues related to the research problem?
5. Do participants feel they gained a better understanding of the research across disciplines related to the Working Group's research problem?
6. What impact do participants feel the Working Group will have on their future research?
7. Were participants satisfied with the accommodations offered by NIMBioS?
8. What changes in accommodations, group format, and/or content would participants like to see at future meetings?

¹ From Kirkpatrick, D.L. (1994). *Evaluating Training Programs: The Four Levels*. San Francisco, CA: Berrett-Koehler.

Evaluation Procedures

NIMBioS' Evaluation Coordinator designed an electronic survey aligned to the evaluation questions with input from the NIMBioS Director and Deputy Director and the organizers of the Working Group. The final instrument was hosted online via UT's secure online survey host mrInterview. Links to the survey were sent to 12 Working Group participants (NIMBioS employees Suzanne Lenhart, Graham Hickling, and Agricola Odoi were not expected to participate in the evaluation) on April 29, 2009. Reminder emails were sent to non-responding participants on May 4 and May 8, 2009. By May 15, 2009, nine participants had given their feedback, for a response rate of 75%.

Data Analysis

Data from the electronic survey included both forced-response and supply-item questions. All data were downloaded from the online survey host into the statistical software package SPSS for analysis. Quantitative data were analyzed using SPSS, while qualitative data were analyzed in SPSS Text Analysis for Surveys. Qualitative responses were categorized by question and analyzed for trends.

Findings

Participant Satisfaction

Overall Satisfaction

Overall satisfaction with the Working Group was high among respondents, the majority of whom (89%) indicated they either agreed or strongly agreed that the Working Group was very productive and met their expectations. Some general participant comments:

"It was very worthwhile; I look forward to the continued work and final products."

"I think the institute is on the right track and will be a first class place for research..."

Almost all respondents thought the presentations were useful as well (89%) and that the presenters were very knowledgeable about their presentation topics (100%). Additionally, all but one of the respondents indicated they either agreed or strongly agreed that they would recommend participating in NIMBioS Working Groups to their colleagues (Table 1).

Table 1. *Participant satisfaction with various aspects of the Working Group, by level of agreement*

	<i>n</i>	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I feel the Working Group was very productive.	9	33%*	56%	11%	0%	0%
The Working Group met my expectations.	9	44%	44%	11%	0%	0%
The presenters were very knowledgeable about their topics.	9	44%	56%	0%	0%	0%
The presentations were useful.	9	44%	44%	11%	0%	0%
The group discussions were useful.	9	56%	33%	11%	0%	0%
I would recommend participating in NIMBioS Working Groups to my colleagues.	9	56%	33%	11%	0%	0%

* Note: Percentages in tables may not add to 100% due to rounding

Satisfaction with Accommodations

Overall, respondents reported being satisfied with the travel, housing, and facilities provided by NIMBioS during the Working Group. One participant’s comments about the overall accommodations:

“I was very impressed with the accommodations at NIMBioS - very progressive.”

NIMBioS arranged housing and travel for four respondents, three of whom said they were very satisfied with their accommodations, while one indicated feeling “neutral.” The majority of participants also reported being satisfied with the comfort and resources of the NIMBioS facility, as well as the quality of meals provided (Table 3).

Table 3. *Participant levels of satisfaction with Working Group accommodations*

Please indicate your level of satisfaction with the Working Group accommodations:	<i>n</i>	Very satisfied	Satisfied	Neutral	Dissatisfied	Strongly dissatisfied
Comfort of the facility in which the Working Group took place	8	63%	25%	13%	0%	0%
Resources of the facility in which the Working Group took place	8	75%	13%	13%	0%	0%
Quality of meals	8	63%	13%	25%	0%	0%
Quality of drinks and snacks provided	8	63%	13%	25%	0%	0%

Working Group Format and Content

Participant Learning

Respondents were asked several questions to gauge their level of learning about the main issues related to the research problem, including the problems associated with feral swine and pseudorabies, as well as alternative mathematical/modeling approaches that could provide insight into this problem.

Respondents reported varying levels of learning. While the majority of respondents agreed that they had a better understanding of the main issues related to FSP, some respondents said they either did not gain understanding, or felt “neutral” or about the amount of understanding they gained on the topics (Table 3).

Table 3. *Participant self-reports of learning about issues related to the Working Group’s research problem*

As a result of participating in this Working Group, I have a better understanding of:	<i>n</i>	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
our problem with feral swine and pseudorabies virus.	9	33%	44%	22%	0%	0%
alternative mathematical/modeling approaches that could provide insight into this problem.	9	11%	78%	11%	0%	0%
opportunities to generalize the outputs of this Working Group to disease problems in other wildlife/agriculture areas.	9	44%	33%	11%	11%	0%

Progress Toward Goals

All respondents agreed that the format of the Working Group was very effective for achieving its goals, although one offered a suggestion for change:

“If it could be arranged that the main topics and subgroups were set earlier (the first day?) so that we’d have more time to work through some details before the end.”

Additionally, all respondents agreed that the Working Group made adequate progress toward its goal of finding a common language across disciplines for research on FSP; however, some respondents felt it would take several more meetings to fully accomplish this goal. Some participant comments:

“...there is still a lot to be done in terms of the modeling, the discussions described the problem adequately for us to make decisions on the techniques.”

“...there is still some gap between the data people and the math/modelers.”

Seventy-eight percent of respondents felt the Working Group made adequate progress toward its goal of formulating an approach to control of pseudorabies in feral swine, while 100% of respondents said they left this meeting with a good idea of what their contribution will be at the next meeting:

“We are at the beginning stages of just figuring out how to model the basic elements of feral swine and their diseases, but we are on track to creating a framework to test and evaluate methods of control.”

“Still very early days. We did make good progress. Whether or not we actually fulfill our goals will depend on subsequent meetings.”

Impact on Future Research Plans

Several respondents said the multidisciplinary composition of the Working Group was its most useful aspect, as they were able to learn from those in fields other than their own:

“The composition of the Working Group was perfect Mathematicians + Veterinary Epidemiologists + Ecologists. I learned a lot from experts from other disciplines.”

“The background/education provided on the different modeling approach alternatives [was useful].”

“bringing together a range of people with different perspectives and knowledge [was useful].”

Several respondents said they felt that the exchange of ideas that took place during the Working Group would (or potentially would) initiate and/or influence their future research. Some participant comments:

“...Because animal diseases are being transferred to humans, future research should include the impact humans have on animal diseases and vice versa.)”

“... The questions and concerns of practitioners always give insight into new areas of investigation. For example, it was raised that some of the problems were due to human behavior in some areas, so how can that be part of the model and part of the control? Also, the government people needed the results to not just be numbers but interpreted as impact on their mission; so how can we put a value on some of the elements of the model?”

“...Our discussions brought to light some areas where research is needed to provide information to help model as well as possible - I could do field research to get at these inputs/variables”

In addition to new ideas for research, four respondents said that they developed unanticipated plans for collaborative research with other Working Group participants, while one said the potential for collaboration was present:

“...I'm pleased that I will have the opportunity to work in a small group with people outside mathematics on something that may have direct impact on questions of disease spread between

feral and domestic hogs, and may also, provide a framework for studying the spread of different diseases among different species.”

“...I got some of the participants interested in working in African parks where similar problems are experienced.”

Suggestions for Future Working Group Meetings

Respondents were asked several questions soliciting suggestions for future Working Group meetings. While most respondents said they could not think of anything to change, some did offer ideas. One theme that emerged from analysis of participant comments was the inclusion of more people in the group:

“The numbers were a little down. I think if more of those invited attend next time the meeting will be even more productive.”

“For this particular group, it would have been helpful to have someone from the TN or NC state government to discuss their concerns about the issue.”

“A few more biologist in the group.”

Another participant suggested including a hike in the Smokies as a part of the Working Group schedule:

“I think it would be useful to explicitly include a hike in the Smokies as a core part of the working group. Establishing informal contacts between participants is a key part of a working group. One of the core elements to the success of NCEAS is that people really enjoy coming to Santa Barbara. Knoxville unfortunately does not really have the same intrinsic attraction within the city limits, so I think it needs to take advantage of what it does have, which is proximity to the Smokies.”

Other suggestions from respondents included scheduling a group meal outside of the NIMBioS facility for a change of scenery, and clarifying the role of the GSMNP in the Working Group:

“The experience was good. However, it was a little unclear regarding how the issue of pseudorabies in wild hog in Great Smoky Mountains National Park was determined. It was my understanding that NIMBIOS wanted to use pseudorabies in wild hogs in the Park as a local example of an issue the group could address. However, during the workshop, some conversations made it appear as if the Park was asking the group for help on how to address the issue of pseudorabies in wild hogs. Because of this confusion, I was not as well prepared for some of the questions.”

Conclusions and Recommendations

Overall, the Working Group was successful in making progress toward its goals. Working Group respondents were satisfied with the meeting, indicating that it was a productive experience that met their expectations. Respondents were also satisfied with the travel, housing, and other amenities offered by NIMBioS.

Respondents gained varying degrees of understanding about the issues surrounding the research problem of the Working Group. While the majority of respondents agreed that they had a better understanding of the main issues related to FSP, some indicated they either did not gain understanding, or felt “neutral” or about the amount of understanding they gained on certain topics.

The majority of respondents felt that adequate progress was made toward the goal of finding a common language across disciplines in FSP research, but that it would take several more meetings before the goals could be fully realized. Seventy-eight percent felt the Working Group made adequate progress toward its goal of formulating an approach to control of pseudorabies in feral swine, while 100% said they left this meeting with a good idea of what their contribution will be at the next meeting:

Several respondents indicated they planned to take the knowledge they gained during the Working Group and apply it to their own research. Four respondents reported they had developed solid plans for collaborative research with other Working Group participants, while others indicated they saw potential for collaboration in the future.

While most respondents could not think of ways to improve future meetings, several suggestions were offered, including inviting various other respondents into, incorporating a hike in the Smokies into the Working Group agenda, and getting out of the NIMBioS facility during the day for a group meal on campus.

Based on analysis of participant response data, the recommendations are as follows:

- The Working Group had a good multidisciplinary composition, but consider the request to invite someone from the TN or NC state government to discuss his or her concerns about FSP at the next meeting.
- Given that 22% of respondents indicated they did not learn enough about opportunities to generalize the outputs of this Working Group to disease problems in other wildlife/agriculture areas, consider emphasizing these ideas at the next meeting.
- While the suggestion to include a mandatory hike in the agenda is not feasible considering the potential variation in abilities of respondents, consider the feasibility of offering an optional organized hike for those interested.
- Consider the possibility of scheduling a group breakfast or lunch outside of the NIMBioS facility.

Appendix A

List of Participants

Participants

Last name	First name	Institution
Collins	Charles	University of Tennessee
Corn	Joseph	University of Georgia
DeLozier	Kim	Great Smoky Mountains National Park
Haydorn	Daniel	University of Glasgow
*Hickling	Graham	NIMBioS
Kasari	Ellen	USDA, APHIS, Veterinary Services
*Lenhart	Suzanne	NIMBioS
Lungu	Edward	Ohio State University
McCallum	Hamish	University of Tasmania
McMillan	April	Oak Ridge National Laboratory
Odoi	Agricola	University of Tennessee
*Real	Les	Emory University
Salinas	Rene	Appalachian State University
Stiver	Bill	Great Smoky Mountains National Park
VerCauteren	Kurt	USDA, APHIS, Wildlife Services

* Organizer of Working Group

Appendix B

Feral Swine/Pseudorabies Working Group Survey

Feral Swine/Pseudorabies Working Group Survey

Thank you for taking a moment to complete this survey. Your responses will be used to improve the Working Groups hosted by the National Institute for Mathematical and Biological Synthesis. Information supplied on the survey will be confidential, and results will be reported only in the aggregate.

NIMBioS will send two reminder emails to Working Group participants who have not responded to this survey. If you would like to be excluded from these reminder emails, please enter your name below. Your survey results will still remain confidential and your name will not be associated with any of your responses in reporting of survey results.

Name:

Please check the appropriate box to indicate your level of agreement with the following statements about this Working Group: (Very satisfied, Satisfied, Neutral, Dissatisfied, Very dissatisfied)

I feel the Working Group was very productive.

The Working Group met my expectations.

The presenters were very knowledgeable about their topics.

The presentations were useful.

The group discussions were useful

I would recommend participating in NIMBioS Working Groups to my colleagues.

Please check the appropriate box to indicate your level of agreement with the following statements.

As a result of participating in this Working Group, I have a better understanding of:

(Strongly agree, Agree, Neutral, Disagree, Strongly disagree)

our problem with feral swine and pseudorabies virus.

alternative mathematical/modeling approaches that could provide insight into this problem.

opportunities to generalize the outputs of this Working Group to disease problems in other

wildlife/agriculture areas.

Do you feel the Working Group made adequate progress toward finding a common language across disciplines in feral swine/pseudorabies research?

Yes

No

Comments:

Do you feel the Working Group made adequate progress toward formulating an approach to control of pseudorabies in feral swine?

Yes

No

Comments:

Do you feel the expectations for the next Working Group are clear (in the sense that you are leaving this meeting with a good idea of what your contribution will be at the next meeting)?

Yes

No

Comments:

Do you feel that the exchange of ideas that took place during the Working Group will initiate or influence your future research? Please explain:

Did you develop unanticipated plans for collaborative research with other Working Group participants? Please explain:

What do you feel was the most useful aspect of the Working Group?

What would you have changed about the Working Group?

How do you feel about the format of the Working Group?

This was a very effective format for achieving our goals

This was not a very effective format for achieving our goals ->

The Working Group format would have been more effective if:

Is your work currently supported by an NSF grant?

Yes

No

Name of NSF grant:

Institution at which NSF grant is held:

Was your housing during the Working Group arranged by NIMBioS?

Yes ->

No

Overall, how satisfied were you with your housing arrangements?

Very satisfied

Satisfied

Neutral

Dissatisfied

Very dissatisfied

Comments about housing arrangements:

What could NIMBioS have done to make your stay in Knoxville more enjoyable (e.g. better information about nearby attractions, public transportation, etc.)?

Was your transportation to Knoxville arranged by NIMBioS?

Yes ->

No

Overall, how satisfied were you with your travel arrangements?

Very satisfied

Satisfied

Neutral

Dissatisfied

Very dissatisfied

Comments about travel arrangements:

Please indicate your level of satisfaction with the Working Group accommodations:

(Very satisfied, Satisfied, Neutral, Dissatisfied, Very dissatisfied)

Comfort of the facility in which the Working Group took place

Resources of the facility in which the Working Group took place

Quality of meals

Quality of drinks and snacks provided

Please indicate any changes NIMBioS can make to improve the resources and/or accommodations available to Working Group participants:

Additional comments about Working Group accommodations:

Please provide any additional comments about your overall experience with the Working Group:

Demographics

Your participation in answering the following questions is completely voluntary and will be used for aggregated reporting only. Answer only those questions with which you feel comfortable.

I am a(n):

Graduate student

Postdoctoral researcher

University faculty—teaching/research

University faculty—teaching only

University faculty—research only

University staff

Government

Business/industry employee

Non-profit organization employee

Other:

If you are affiliated with a college/university, please describe your institution: (check all that apply)

2-year institution

4-year institution

Minority serving institution

Women's only institution

Not applicable

Please give a 2-5 word description of your main area of business/education/research (e.g. mathematical immunology, high school science teacher, etc.)

Gender:

Male

Female

Are you Hispanic or Latino?

Yes

No

What is your racial background? (check all that apply)

American Indian or Alaska Native

Native Hawaiian or other Pacific Islander

Asian

Black or African American

White

Appendix C

Open-ended Survey Responses

Open-ended responses, by question and response category

Do you feel the Working Group made adequate progress toward its goal of finding a common language across disciplines for feral swine/pseudorabies research? Comments: (n=3)

Not yet, but getting there (2)

Although there is still some gap between the data people and the math/modelers.

Although there is still a lot to be done in terms of the modeling, the discussions described the problem adequately for us to make decisions on the techniques.

Miscellaneous (1)

I have yet to get a briefing on the second day so will withhold judgment

Do you feel the Working Group made adequate progress toward formulating an approach to control of pseudorabies in feral swine?(n=4)

Miscellaneous (4)

We are at the beginning stages of just figuring out how to model the basic elements of feral swine and their diseases, but we are on track to creating a framework to test and evaluate methods of control.

Still very early days. We did make good progress. Whether or not we actually fulfill our goals will depend on subsequent meetings

For the smoky mountain problem, once the park boundaries are drawn the problem will be manageable but translating the solutions here to other areas will not be straight forward

Adequate progress, yes. Ideas that will truly lead to control.....we've got some work to do.

Do you feel the expectations for the next Working Group are clear (in the sense that you are leaving this meeting with a good idea of what your contribution will be at the next meeting)? (n=1)

I will have more to contribute next time. The smoky mountain park has many similarities with Kruger National Park in South Africa which has boundaries in three different countries. Habitat management is not uniform and poaching in one country affects animal populations in other areas.

Do you feel that the exchange of ideas that took place during the Working Group will initiate or influence your future research? Please explain: (n=7)

Yes (4)

Yes. Because animal diseases are being transferred to humans, future research should include the impact humans have on animal diseases and vice versa.

Yes. The questions and concerns of practitioners always give insight into new areas of investigation. For example, it was raised that some of the problems were due to human behavior in some areas, so how can that be part of the model and part of the control? Also, the government people needed the results to not just be numbers but interpreted as impact on their mission; so how can we put a value on some of the elements of the model?

Yes, especially population modeling.

I think it will. In particular, I am hoping it will lead to developing and learning new approaches for the modeling of spatial spread.

Possibly (2)

Potentially. Our discussions brought to light some areas where research is needed to provide information to help model as well as possible - I could do field research to get at these inputs/variables.

Possibly - Especially with hog population modeling. Determining changes in density will help relate the effectiveness of hog control in the Smokies.

No(1)

no

Did you develop unanticipated plans for collaborative research with other Working Group participants? Please explain: (n=6)

Yes (4)

Yes. I got some of the participants interested in working in African parks where similar problems are experienced.

I'm currently working with the hog population modeling group. We are in the early stages of discussion.

I guess so, because I had not anticipated what might come out of the Working Group at all

I didn't know what to expect, so I can't say what developed was unanticipated. However, I'm pleased that I will have the opportunity to work in a small group with people outside mathematics on something that may have direct impact on questions of disease spread between feral and domestic hogs, and may also, provide a framework for studying the spread of different diseases among different species.

Not yet, but planning on future collaborations (1)

No. But there is potential.

Miscellaneous (1)

maybe

What do you feel was the most useful aspect of the Working Group? (n=6)

Multidisciplinary composition of the group (4)

The composition of the working group was perfect Mathematicians + Veterinary Epidemiologists + Ecologists. I learned a lot from experts from other disciplines.

The background/education provided on the different modeling approach alternatives.

Multidisciplinary composition of the working group members

bringing together a range of people with different perspectives and knowledge

Miscellaneous (2)

I think the result (population model) of the working group will be a tangible product that will prove to be extremely useful for the future in determining the effectiveness of the Smokies hog control program.

As with most meetings, the sharing of information was useful, but the conversations, both structured and unstructured about the impact of that information, was the most useful.

What would you have changed about the working group? (n=6)

Inclusion of more people (3)

the numbers were a little down. I think if more of those invited attend next time the meeting will be even more productive

For this particular group, it would have been helpful to have someone from the TN or NC state government to discuss their concerns about the issue., In general, more time would always be good. If it could be arranged that the main topics and subgroups were set earlier (the first day?) so that we'd have more time to work through some details before the end.

A few more biologist in the group.

Nothing (3)

Nothing

I'll have to think on that one.

I would leave it as it is.

Name of NSF grant: (n=0)

Institution at which NSF grant is held: (n=0)

Comments about housing arrangements: (n=2)

Miscellaneous (2)

Perfect

Excellent location, nice hotel, worked very well

What could NIMBioS have done to make your stay in Knoxville more enjoyable (e.g. better information about nearby attractions, public transportation, etc.)? (n=3)

Nothing--everything was great (2)

Nothing - was very nice.

I was very happy with the arrangements.

Miscellaneous (1)

I think it would be useful to explicitly include a hike in the Smokies as a core part of the working group. Establishing informal contacts between participants is a key part of a working group. One of the core elements to the success of NCEAS is that people really enjoy coming to Santa Barbara. Knoxville unfortunately does not really have the same intrinsic attraction within the city limits, so I think it needs to take advantage of what it does have, which is proximity to the Smokies.

Comments about travel arrangements: (n=2)

Miscellaneous (2)

Well arranged

It was a little clumsy because my employer (USDA) is getting harder and harder to deal with as related to travel..

Please indicate any changes NIMBioS can make to improve the resources and/or accommodations available to Working Group participants: (n=5)

Miscellaneous (5)

None

I'm local, so I have no comment.

I was very impressed with the accommodations at NIMBioS - very progressive.

I think the institute is on the right track and will be a first class place for research once the computers are installed.

I listed satisfaction with meals etc as "neutral". There was nothing wrong with the pack food provided, but I think in the future that it would be good to get participants out of the building for lunch and possibly breakfast. A change of scene and fresh air are important.

Additional comments about Working Group accommodations: (n=0)

Please provide any additional comments about your overall experience with the Working Group: (n=3)

Miscellaneous (3)

The experience was good. However, it was a little unclear regarding how the issue of pseudorabies in wild hog in Great Smoky Mountains National Park was determined. It was my understanding that NIMBIOS wanted to use pseudorabies in wild hogs in the Park as a local example of an issue the group could address. However, during the workshop, some conversations made it appear as if the Park was asking the group for help on how to address the issue of pseudorabies in wild hogs. Because of this confusion, I was not as well prepared for some of the questions.

It was very worthwhile; I look forward to the continued work and final products.

It was a very friendly but very serious group. There were very frank discussions scientifically, technically etc.

Please give a 2-5 word description of your main area of business/education/research (e.g. mathematical immunology, high school science teacher, etc.) (n=7)

Wildlife biology (2)

Wildlife Biologist

Ecology of Wildlife Disease

Mathematical research (2)

Mathematical researcher in immunology and epidemiology

mathematical modeling and computational science

Government (3)

I am in the Computational Sciences and Engineering Division at Oak Ridge National Lab.

Government/National Park Service - Biologist

federal govmt wildlife-livestock interface researcher