

Wild Sheep Society of BC – A Gap Analysis of British Columbia’s Sheep Separation Program



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EXECUTIVE SUMMARY

The British Columbia Sheep Separation Program (BCSSP; hereafter referred to as the Program) is an important program for British Columbia's wild sheep that focusses on promoting healthy wild sheep populations throughout the province by preventing their contact with domestic sheep and goats. Managing for healthy wild sheep requires maintaining spatial separation between wild and domestic sheep and goats if disease-related die-offs are to be prevented. The results of this gap analysis suggest that to be effective, the Program should continue to have a coordinator and be inclusive of First Nations, livestock producers, local governments and all relevant government agencies. Secure sources of funding will allow the Program to provide long term security to projects and positions, including the program coordinator. The coordinator must be a good facilitator and able to accommodate a diverse and passionate stakeholder committee. Projects should be documented and catalogued in a secure and maintained digital database where the public and stakeholders can review and track the Program's progress. The Program should use outreach programs that are provincial in scope and incorporate a multitude of means including social media to inform and educate. There are other risks to wild sheep that may influence the Program's success, because so many factors can influence the health of wild sheep populations, but no other risk has the ability to decimate sheep populations as quickly as the pneumonia related die-offs that result from contact with domestic sheep and goats. Dedicated efforts through a separation program will help keep domestic sheep and goats away from wild sheep and, in the least, lessen the chance of these epizootics.

Recommended actions for the Program:

- Maintain the Program and continue providing a project coordinator to drive the program and keep the stakeholder committee informed and involved. Define deliverables for the coordinator.
- Seek secure, long-term capital resources for the Program and coordinator.
- Gather all available information collected and developed by the Program and add it to the existing provincial wildlife databases (SPI or Ecocat). Ensure that the Program is aware of these data and how to access them.
- Make public education of disease risks between domestic sheep and goats and wild sheep a priority, especially in areas of high risk.
- Complete the wild sheep registry including the mapping of habitat suitability, population distributions and risk of disease transmission; linking spatial information to potential cumulative effects analysis in a GIS-based environment.
- Incorporate social media into outreach programs and extend the message across the province. Increase public awareness of the disease risks associated with contact between domestic sheep and goats and wild sheep.
- Achieve government support and understanding between all relevant ministries (i.e. Ministry of Forest Lands and Natural Resource Operations, Ministry of Agriculture).
- Seek a constructive working relationship with domestic sheep farmers and large-scale producers.
- Involve First Nations and seek support via resolutions and position statements.
- Continue mitigative efforts wherever wild-domestic sheep contact issues arise until longer term legislative actions can be put in place.

- Pursue complete exclusion of domestic sheep in thorn sheep habitat in northern BC. Build off the model developed in the Skeena Region, using both the LRMP and regional districts to keep domestic sheep and goats out of wild sheep habitat.
- Continue applying political pressure to create policy, and ultimately enforceable legislation that prevents contact between domestic sheep and goats and wild sheep in BC.

TABLE OF CONTENTS

Acknowledgements..... 2
Executive Summary 3
1.0 Introduction..... 6
2.0 Methods..... 7
2.1 Stakeholder Identification and Survey 7
3.0 RESULTS and Discussion..... 8
3.1 SWOT Analysis (Strengths Weaknesses/Limitations, Opportunities, Threats) of the British Columbia Sheep Separation Program: 15
4.0 Recommendations 16
Literature Cited 17
APPENDIX A: Stakeholder Respondents 19
APPENDIX B: Interview Questionnaire and Response Summary..... 21

1.0 INTRODUCTION

The Wild Sheep Society of British Columbia (WSSBC) is a volunteer run society that works with government and private (e.g. outfitters, ranchers) and public stakeholders (e.g. landowners on whose property wild sheep reside) in the interest of wild sheep in BC. The society provides funding and volunteer labor for research and management actions in the interest of wild sheep in the province.

The goals of the WSSBC are:

To promote the cause of wild sheep conservation and preservation through:

- Protection and enhancement of habitat for wild sheep and associated wildlife,
- To unite sportsmen with one purpose, the safeguarding of these natural resources for future generations,
- To support the rights of its members in their endeavors to preserve our environment, and
- To maintain and promote the right to hunt in a safe and ethical manner and to foster good will, sportsmanship and fair chase in light of all rules and regulations.

In 1999 the BC Wild Sheep Working Group was founded with various stakeholders including the WSSBC, in lieu of an all-age pneumonia-related die-off experienced by bighorn sheep (*Ovis canadensis*) in the South Okanagan (Harper et al. 2002). The WSSBC has subsequently provided financial assistance to the British Columbia Sheep Separation Program (i.e. the Program). The Program was built on a model for bighorn sheep in the Kootenay and Okanagan regions (Regions 4 and 8, respectively) and expanded to Regions 3 and 5 in the southern portions of the province, which also have bighorn sheep coming into close proximity or contact with domestic sheep. The ultimate goal of the Program is to reduce the risk of disease transmission by minimizing or preventing association between wild and domestic sheep or goats in the province, on both private and Crown lands. The current Program model uses a seven-staged approach consisting of:

- 1) Developing and maintaining an effective stakeholder committee,
- 2) Field work on bighorns involving:
 - i. age/sex classification counts,
 - ii. bighorn habitat evaluation and habitat enhancement by habitat manipulations – i.e. prescribed burning, weed control and native plant establishment,
 - iii. habitat assessment and classification to risk category,
- 3) Identification and mapping of domestic livestock producers in risk areas,
- 4) Contacting individual landowners, presentations to public meetings and other extension activities – educating about disease transmission risk,
- 5) Developing and delivering site-specific mitigation option lists for domestic livestock producers – i.e. land stewardship, land acquisition and livestock health management,
- 6) Presentations and input to local government regarding risks and suggestions for bylaws on re-zoning of lands,
- 7) Assisting in drafting First Nation resolutions to reduce risk by the prohibition of domestic sheep and goat farming where there is a risk of contact with wild sheep.

Most recently the Skeena Region (Region 6), in northwestern BC, has taken a proactive approach in the separation of domestic and wild sheep (Bill Jex, pers. comm. 2012). They have done this by engaging all First Nations, and Regional Districts (Kitimat Stikine, Stikine, Bulkley - Nechako) and applying Land and Resource Management Plans (LRMP; Atlin – Taku and Cassiar Iskut – Stikine) to establish legislation and bylaws that prevent domestic sheep and goats from entering those areas containing thinhorn sheep (i.e. *Ovis dalli*). The goal is to expand this legislative approach across all thinhorn range in northern BC.

Until this time there has been no assessment of the Program's model or the role of its project coordinator. As such the goal of this study is to review the Program, its committee (i.e. Wild Sheep Working Group) and its coordinator's position, including an assessment of the approach, funding, delivery and outreach. The recommendations of this study reflect a synthesis of the various stakeholder responses, external references and my personal assessment and opinion.

2.0 METHODS

The Program model, committee and its coordinator position were assessed using a survey of stakeholders directly or indirectly affiliated with the program and a review of approaches in Texas and Nevada where separation between domestic and wild sheep and goats remains a current issue.

2.1 Stakeholder Identification and Survey

The contact list of the relevant stakeholders was established from individuals involved with wild and domestic sheep management in BC (Appendix A) and/or individuals that have contributed in advisory roles to the Program.

The specific data on the funding, delivery and outreach of the Program model was gathered from a survey of the stakeholders conducted using an online survey program (Appendix B); and follow-up phone conversations. The survey consisted of 4 parts (Appendix B) with responses from the being entered into a 2 × 2 SWOT (Strengths, Weaknesses/Limitations, Opportunities and Threats) matrix to analyze the internal strengths and weaknesses as well as external opportunities and threats to achieving the separation objective.

The first section of the survey consisted of a set of questions gauging respondent involvement and awareness of the program. The second survey section evaluated the model (i.e. seven-staged approach) for achieving the Program goal of reducing the risk of disease transmission by minimizing or preventing association between wild and domestic sheep or goats in the province, on both private and Crown lands (Wild Sheep Working Group 2010) (Appendix B). The seven-staged approach was not necessarily the model followed during the inception of the Program and regional variance existed with its delivery, especially in regards to the field work conducted. All of the funding proposals, however, submitted to the Habitat Conservation Trust Fund since 2005 explicitly cite this model.

The committee and coordinator's position were also judged against this seven-staged model as part of the analysis in the third section of the survey; "Committee and Coordinator

Effectiveness” (Appendix B). The questions evaluating the working group committee were developed using the five operational principles of stakeholder engagement for a functioning stakeholder committee from the Stakeholder Engagement Practitioner Handbook published by the Australian Government (2008). Question 17 was based on this publication and was specific to how the working group committee functioned internally as a group.

A gap analysis is conducted in order to assess whether a program is meeting primary goals and objectives and if necessary, to suggest strategies that would re-align the program in the future. The last section of the survey; “Future Direction”; was developed to find approaches for directing the program moving forward (Appendix B).

Collectively the four web-based survey sections, literature and external references provide the majority of the information in the results and discussion, including the SWOT analysis. The recommendations were developed by matching and conversion of the four SWOT measures. Opportunities available to the program were matched with strengths and through conversion of weaknesses or threats into strengths. Peer-reviewed literature was used to reinforce recommendations and support discussions.

Additional questions posed to initiate discussion with third party references from Texas and Nevada included:

- How do you keep domestic sheep from coming into contact with wild sheep?
- Do you have a separation program?
- What are the components of your separation program that work well?
- What parts of your separation program haven't worked or should be avoided?
- Is there legislation governing the separation of domestic and wild sheep? If yes, who administers and enforces the laws?

3.0 RESULTS AND DISCUSSION

The risk of disease transmission from domestic sheep or goats to wild sheep is widely recognized as a limiting factor to wild sheep populations (for a comprehensive review see Wild Sheep Working Group 2012). Until the risk of disease transmission from domestic sheep or goats to wild sheep is acknowledged by all provincial ministries and those involved in wildlife and agricultural management, the risk of all-age, pneumonia related die-offs in wild sheep populations will remain a real possibility in BC. Solutions will be difficult, if not impossible to achieve if the ignorance or lack of knowledge around disease transmission is not overcome. As such, the Program is a fundamentally good program with a sound approach that lacks in support, documentation and outreach. Nearly all survey participants felt that separation was important to maintaining healthy sheep populations and the approaches in the seven-staged model are well supported both from internal stakeholders and from external sources with similar separation issues. An overwhelming majority of survey respondents believe a project coordinator is essential to drive the program forward and to keep the various stakeholders informed and on task. The survey responses are summarized in Appendix B including all comments provided by respondents. Although the analysis is lacking quantifiable statistics and is biased towards individuals with a responsibility or vested interest to keeping wild sheep healthy, the responses

from stakeholders provide valuable information that can be used to help the Program moving forward and all recipients of this analysis are encouraged to review the responses for themselves (Appendix B). Survey responses are summarized into Strengths, Weaknesses, Opportunities and Threats (SWOT analysis; section 3.1) immediately following this section.

Participation to the survey was excellent with >87% (28/32) of the requested respondents completing the survey in full. One additional participant partially completed the survey. Responses to the online survey are summarized in Appendix B, including all unedited comments.

The largest group of stakeholders invited to participate in the survey were government staff and participation was innately biased toward this group (Question 1). Government staff comprised 52% of the respondents in the online survey, largely because seven of the nine regions in BC contain wild sheep and by default regional biologists are included in the Wild Sheep Working Group due to their role in wild sheep management. The next largest group of stakeholders were advisers (31%) to the Program (Question 1). As a whole, the majority of all respondents were involved with the Program for greater than one year (> 86%; Question 2). Almost half of the respondents are or have been involved in domestic or wild sheep management in BC, especially from the southern regions of the province where most of the program's work has focused (Question 3 and 4).

Disease was cited as the number one risk to wild sheep populations by 15 of the 29 respondents, followed by habitat loss, predation and competition, respectively (Question 5). If stressors such as poor habitat or predation are also affecting a sheep population, the resiliency of the herd to withstand a disease related die-off will only be reduced. An overwhelming majority of respondents (90%) felt that the separation of domestic and wild sheep should be a priority for wild sheep management (Question 6). This helps justify the need for a separation program especially if British Columbian's consider wild sheep as an economically, socially or intrinsically valuable resource.

The seven-staged model used by the Program was well supported by the stakeholders surveyed. Respondents generally felt that the model was important to achieve the goal of reducing the risk of disease transmission by minimizing or preventing association between wild and domestic sheep or goats in the province, on both private and Crown lands (Question 7). This was especially true for education and communication of disease risks to the public as not one respondent felt that it was not at least somewhat important and 23 of the 28 people surveyed felt that it was extremely important (Question 7). The type of field work coordinated by the Program has been as diverse as the number of stakeholders on the committee. Although the specified list outlines projects that have all been assisted by the Program, only fencing and herd risk assessments were generally recognized by most stakeholders (Question 8). There were several notable comments that recognized important projects involving the Program including the BC Regional Assembly of First Nations Resolutions in the Okanagan Valley on "Domestic Sheep and Goats in Wild Sheep and Mountain Goat Habitats", producer buyouts and livestock conversions from sheep to cattle and risk assessment tools. These comments are addressed in other stages of the model but ultimately have and should be used to support the separation goal (Question 11).

Both digital and hardcopy maps have been created to track domestic sheep farms and wild sheep herds in high risk areas but many individuals involved with the Program are unaware of their location (Question 9). Linking all spatial information used by the Program in a Geographic Information System (GIS)-based environment would allow for the development of spatial tools that could aid in herd-risk assessments and cumulative effects modeling. GIS-based maps can also be easily reproduced or modified and improve the sharing of spatial information. This is also the case with other information produced or collected by the Program as no central repository has been dedicated for this purpose (Question 13). There is a substantive lack of publicly available information on any projects administered by the Program and not one piece of the program's information is tagged with the Program name in any government database. As a central repository, both the government Species Inventory database (SPI), and the Ecological Report Catalogue (Ecocat) provide a good, government maintained location for stakeholders and public to access, at no cost to the Program. This consistency in data storage and retrieval becomes increasingly important as the Program evolves and the persons involved change. Materials can be locked if their contents are sensitive or contain confidential information.

Outreach programs for informing public and stakeholder groups have used a multitude of traditional media types (newspapers, radio, meetings, etc) but no forms of social media (Question 10). There are advantages and disadvantages of traditional media like television, billboards, radio and newspaper relative to social media such as Facebook, Twitter and Wikipedia but no other marketing tool right now can engage as broad an audience and as cheaply as social media (Kaplan and Haenlein 2010). Social media is applicable to any size of organization regardless of their political or social affiliations and the potential gains may help create enough societal awareness to bring separation into the political arena where legislative decisions can be made. This is not to say that traditional media forms shouldn't be used, as they provide a lot of measurable value, especially to the older age groups in society. Social media, rather, should be incorporated into existing media already used by the Program (Kaplan and Haenlein 2010). Intensive educational outreach programs that inform both public and livestock producers is the only way Texas (Clay Brewer, pers. comm. 2012) and Nevada (Mike Cox, pers. comm. 2012) are able to keep domestic sheep and goats from coming into contact with wild sheep. There are no separation programs within these states and only a trusting working relationship with producers and public vigilance keep domestic sheep and goats from coming into contact with wild sheep. This has not been a fail-safe approach but currently provides the only available method to keep domestics away from wild sheep. Bighorn sheep in Texas were completely extirpated in the 1960's and now after reintroduction the state is able to offer huntable populations (Anderson 2008) using only a dedicated and diligent outreach program (Clay Brewer, pers. comm. 2012).

First Nations in the Okanagan were the first landholders to set explicit resolutions supporting the exclusion of domestic sheep and goats from all areas within and surrounding current, known, traditional or potential future wild sheep and goat habitats. This support for separation is a major asset and tool that should not be neglected if the separation goal is to be achieved. The Cassiar Iskut – Stikine LRMP had First Nations involvement and support in prohibiting the grazing of domestic sheep and goats on Crown land. It was rated as the lowest serviced approach by both the BC Wild Sheep Working Group (Question 18) and the Project Coordinator (Question 20) even though the majority of survey respondents felt First Nations were one of the most

underrepresented stakeholders (Question 19). The First Nations must be kept part of the program and informed if the program is to be successful.

The other notably absent or underrepresented stakeholder on the committee were the producers and the Ministry of Agriculture. Although the sample size was small (5 producer respondents), responses from producers indicate a sense of threat and disbelief that disease from contact between wild and domestic sheep is a major problem. This may be a lack of understanding and/or a perceived loss in livelihood/lifestyle. Regardless, the lack of participation by sheep farmers and their governing body, the Ministry of Agriculture, does not imply an all-encompassing working group and both should be involved.

The ratings for the working group were slightly above moderate with collaboration being the highest ranked operational principle (Question 17). Inclusiveness was the lowest ranked operational principle indicating stakeholders believed in the separation goal and that people who were kept up-to-date worked well together but some stakeholders were possibly ostracized or felt excluded. In a successful process, each stakeholder generates and then prioritizes ideas that are then shared with the larger group (Australian Government 2008). Sharing gives all involved a sense of participation and consideration. For participation to be successful, it is essential to maintain stakeholder involvement over time which can be achieved by employing a coordinator, as the Program has done, to carry on the work throughout the length of the program. Ongoing attention to the program from a project coordinator insures that two-way communication is maintained. An effective way to maintain stakeholder involvement is through regular progress reports, which, because they contain stakeholder input and opinions, acknowledges that they were heard. The time, energy and opinions of stakeholders are further validated if these reports are made widely available to the public through newspapers, radio, or the internet (Australian Government 2008). Of the approaches used to achieve the separation goal, identification and mapping of livestock producers was the best serviced by the working group. This was followed by maintaining an effective stakeholder committee (Question 18). These were also the same two approaches the project coordinator(s) serviced best. Unfortunately they were only moderately well serviced (Question 20). There was a strong correlation between the project coordinator and the working group ratings for the seven-stage model and fundraising through the Habitat Conservation Trust Fund was largely the only source of monies raised by the project coordinator (Question 21). Only a few unplanned tasks outside of the model approaches were completed by the project coordinator, these include fundraising and project coordination. The most cited ways to improve the position were to provide secure funding with clear expectations and deliverables (Question 21 and Question 22).

Effective project coordinators need to get stakeholders together for input at different stages of the project, and to recognize and reward achievement of milestones. Ongoing communication keeps interest in the program alive and encourages participants to continue their efforts. In addition, it is also important to create a calendar for a project which serves to clarify when milestones are achieved, and when a project has been completed. Documentation of the projects allows for the tracking of a program's progress, and provides measurable data and information that can be drawn upon if stakeholders change. It can also allow fundraisers and stakeholders with material documentation that their time and monies were put to use. Regardless of the efficacy of previous project coordinators, the role was unanimously considered important to keep domestic sheep and

goats separate from wild sheep. Government biologists were recognized as having too little time and too many responsibilities for servicing the requirements of an effective separation program. The position may, however, be held or funded by government if resources were allocated for such. A secure funding source will make the acquisition of a desirable project coordinator easier and allow for longer term projects to be conducted or monitored.

The future of a successful Program in BC will ultimately be judged on the health of the provinces wild sheep populations. Due to the size of BC and the geographic extent of the areas occupied by wild sheep, the program inherently covers a broad geographic range. Most respondents felt that the separation program should target all regions of BC containing wild sheep (Question 24), which should be the case for any ecological or mitigative actions taken as part of the program. These regions include the Thompson, Okanagan, Kootenay, Cariboo, Skeena, Peace and small portions of the Omineca. I strongly recommend that any outreach program, however, should be provincial in scale to inform as many people, vested or not, of the risks associated to wild sheep. This would extend the outreach program to areas outside of wild sheep range, including the two largest domestic sheep producing regions and most populace parts of the province; Fraser Valley and Vancouver and Gulf Islands (Ministry of Agriculture 2012a). A province wide outreach program raises societal awareness and improves vigilance in areas where contact issues may arise.

The higher the conservation value of a wild sheep population (e.g., federally or provincially listed, herds in areas with no history of domestic livestock presence), the more aggressive and comprehensive wild sheep and domestic sheep or goat separation management strategies should be (Wild Sheep Working Group 2012). In northern BC, as with other jurisdictions (i.e. Alaska, Yukon, and the Northwest Territories) containing “thin horns” (*Ovis dalli*), domestic sheep or goat grazing has not been widespread. Although there is no history of catastrophic all-age pneumonia related die-offs and disease has not been identified as a factor limiting thinhorn populations (Nichols and Bunnell 1999), Dall's sheep (*O. d. dalli*) under experimental conditions are as susceptible to pneumonia causing bacteria as bighorn sheep (Foreyt et al. 1996). Their susceptibility to disease (Black et al. 1988), philopatric nature, and lack of tendency to readily disperse or expand ranges (Worley et al. 2004) provides a convincing case to keep thinhorn sheep from coming into contact with domestic sheep and goats.

Registries, the most selected choice among respondents for keeping track of domestic sheep, may provide a good means for large sheep producers (Question 25), but compliance among small farms that do not produce on a large scale may limit the effectiveness of developing the policy even if registration became mandatory. Compulsory registration would also be irrelevant from a separation perspective in areas outside of wild sheep ranges. The tracking of domestic and wild sheep is a difficult and onerous task that ultimately draws information from many sources. Domestic sheep locations have come from local sheep shearers, brand inspectors, British Columbia Sheep Federation Members (2012), British Columbia Purebred Sheep Breeders' Association (2012), British Columbia 4-H, aerial and ground surveillance by government staff, concerned sportsmen, resource industry workers, Wild Sheep Society of British Columbia members and others. Again there is increasing value in building a strong stakeholder committee; with representation from the sheep industry, Ministry of Agriculture (Ministry of Agriculture 2012b) and First Nations; and a well-publicized outreach program that raises societal awareness

of the disease issues. Particular sensitivity to the rights of farmers and property owners will be crucial to developing a trusting, constructive environment in the Program.

All of the options (i.e. collaring, conferences/meetings, surveillance and registries) provide valuable spatial information on the whereabouts of wild sheep (Question 26). Aerial and ground surveillance of wild sheep through regular population and composition inventories may be the most efficient of options. Well planned and documented surveys provide a rigorous and repeatable way of keeping track of wild sheep. These surveys also provide additional recruitment and composition information that can help gauge the health of a population. As with domestic sheep, the approaches for keeping track of wild sheep will be varied. A recent push to catalogue the distribution of wild sheep through a registry has been underway (Diana Demarchi, pers. comm. 2012). If the wild sheep registry is able to accommodate movement corridors and all habitats that a population requires to remain viable, then zoning and appropriate legislation can be accommodated for a population. Whether this is through the province, regional districts, municipalities and/or LRMP's will require considerable thought. This will need to include areas where wild sheep have been extirpated and areas where wild sheep have been relocated into non-traditional areas. A restrictive legislative zoning restriction can ultimately restrict both domestic and wild sheep as dispersing or wandering wild sheep that leave predefined population boundaries may be subject to removal or relocation and domestic farmers within defined wild sheep habitat would have to demonstrate enough diligence that the risk of contact is negligible. No new habitats could be effectively colonized by wild sheep under such a scenario, especially if domestic sheep producers were already established in these areas. This may constrain populations and reduce a population's ability to adapt to changing environments. The legislative approach to separation is not without consequences, but may still be the most effective long-term solution to keeping domestic sheep and goats from coming into contact with wild sheep, especially if laws can be effectively enforced and it can accommodate change. The majority of stakeholders agree that some form of regulatory legislation along with education is the most effective way to keeping domestic sheep and goats separate from wild sheep (Question 27 and 28). Considerable thought must be given to the judicial approach if it is to be effectively administered and enforced.

Several stakeholders cite buffer zones to extend spatial barriers or fencing when required. Both provide effective means of separation but require intensive human or financial resources to develop and maintain and may best be used within a judicial framework. An overwhelming majority of respondents feel that the Program will play a valuable role in the management of healthy wild sheep populations even if only from an education and awareness standpoint; the program keeps the separation issue active (Question 29).

Keeping wild sheep from coming into contact with domestic sheep and goats is going to require a focused, collaborative effort, requiring unified backing from government ministries, and involvement from domestic sheep farmers, First Nations and local municipalities. The Program must acknowledge the rights of sheep farmers and build a respectful, trusting relationship with all stakeholders. This means that all suitable wild sheep habitat will need to be mapped and an action plan that considers dispersing sheep outside of these ranges must be developed and governing authorities must be aware of the procedures for dealing with wild sheep in contact situations with domestics. In the interim a focused outreach program should be developed that

incorporates social media. With enough societal awareness, the program will enter the political arena and enforceable, judicial measures can be developed to keep wild sheep from coming into contact with domestic sheep.

3.1 SWOT Analysis (Strengths Weaknesses/Limitations, Opportunities, Threats) of the British Columbia Sheep Separation Program:

	Helpful	Harmful
Internal Origin	<p>Strengths:</p> <ul style="list-style-type: none"> • strong consensus that the separation of domestic and wild sheep should be a priority for wild sheep management • all of the seven-stages used in the current model are considered important for achieving separation; especially education and communication of disease risks • almost all stakeholders value the role of a project coordinator 	<p>Weaknesses:</p> <ul style="list-style-type: none"> • limited number of First Nation and sheep producers as members in the Working Group • little public awareness • lack of political involvement from all concerned government ministries • no consistent funding source • poor documentation • no central database • no use of social media
External Origin	<p>Opportunities:</p> <ul style="list-style-type: none"> • support from First Nations and First Nations resolutions • Northern LRMP's and regional districts in the Okanagan and Skeena region that are working toward restricting domestic sheep farming within and adjacent to wild sheep range • backing from British Columbia Wildlife Federation and Guide Outfitter Association 	<p>Threats:</p> <ul style="list-style-type: none"> • lack of producer support • no comprehensive provincial legislation or enforceable bylaws

4.0 RECOMMENDATIONS

- Maintain the British Columbia Sheep Separation Program and continue providing a project coordinator to drive the program and keep the stakeholder committee informed and involved. Define deliverables for the coordinator.
- Seek secure, long-term capital resources for the Program and coordinator.
- Gather all available information collected and developed by the Program and add it to the existing provincial wildlife databases (SPI or Ecocat). Ensure the Program is aware of these data and how to access them.
- Make public education of disease risks between domestic sheep and goats and wild sheep a priority, especially in areas of high risk.
- Complete the wild sheep registry including the mapping of habitat suitability, population distributions and risk of disease transmission; linking spatial information to potential cumulative effects analysis in a GIS-based environment.
- Incorporate social media into outreach programs and extend the message across the province. Make people universally aware of the disease risks associated with contact between domestic sheep and goats and wild sheep.
- Pursue universal government support among all relevant ministries (i.e. Ministry of Forest Lands and Natural Resource Operations, Ministry of Agriculture).
- Seek a constructive working relationship with domestic sheep farmers and large-scale livestock producers.
- Involve First Nations and seek support via resolution and position statements.
- Continue mitigative efforts wherever wild-domestic sheep contact issues arise until longer term legislative actions can be put in place.
- Pursue complete exclusion of domestic sheep in thorn sheep habitat in northern BC. Build off the model developed in the Skeena by engaging First Nations, regional districts and incorporating policy into the Land and Resource Management Plans to keep domestic sheep and goats out of thorn habitat.
- Continue applying political pressure to create policy, and ultimately enforceable legislation that prevents contact between domestic sheep and goats and wild sheep and mountain goats in BC.

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APPENDIX A: Stakeholder Respondents

Stakeholder Group	Name	Association	Email	Phone
First Nations	Barry Bennett	Tk'emlups Indian Band Natural Resource Officer	bbennett@kib.ca	250-314-1563
Government	Aaron Reid	Ministry of Forest Lands and Natural Resource Operations/Region 8 Biologist	Aaron.Reid@gov.bc.ca	250-354-6288
	Bert Van Dalfsen	Ministry of Agriculture/Sustainable Agriculture Management	Bert.vanDalfsen@gov.bc.ca	604-556-3109
	Bill Jex	Ministry of Forest Lands and Natural Resource Operations/Region 6 Biologist	Bill.Jex@gov.bc.ca	250-847-7804
	Brian Harris	Ministry of Forest Lands and Natural Resource Operations/Region 8 Biologist	Brian.S.Harris@gov.bc.ca	250-490-8254
	Chris Procter	Ministry of Forest Lands and Natural Resource Operations/Region 3 Biologist	Chris.Procter@gov.bc.ca	250-371-6250
	Conrad Thiessen	Ministry of Forest Lands and Natural Resource Operations/Region 7B Biologist	Conrad.Thiessen@gov.bc.ca	250-787-3287
	Doug Heard	Ministry of Forest Lands and Natural Resource Operations/Region 7A Biologist	Doug.Heard@gov.bc.ca	250-614-9903
	Doug Jury	Ministry of Forest Lands and Natural Resource Operations/Retired Region 3 Biologist	Dougjury@shaw.ca	250-573-5570
	Gerry Kuzyk	Ministry of Forest Lands and Natural Resource Operations/Ungulate Specialist	Gerald.Kuzyk@gov.bc.ca	250-387-5842
	Helen Schwantje	Ministry of Forest Lands and Natural Resource Operations/Wildlife Veterinarian	Helen.Schwantje@gov.bc.ca	250-361-7619
	Irene Teske	Ministry of Forest Lands and Natural Resource Operations/Region 4 Biologist	Irene.Teske@gov.bc.ca	250-489-8551

	Pat Dielman	Ministry of Forest Lands and Natural Resource Operations/Region 5 Biologist	Pat.Dielman@gov.bc.ca	250-398-4561
	Steve Gordon	Ministry of Forest Lands and Natural Resource Operations/Strategic Resource Manager	Steve.Gordon@gov.bc.ca	250-751-7126
Non-Government	Chris Barker	Wild Sheep Society of BC/President	chrisbarker@shaw.ca	250-883-3112
	Clay Brewer	WAFWA/WSWG chair	clay.brewer@tpwd.state.tx.us	325-463-5001
	Daryl Stepaniuk	Former BC Wild/Domestic Sheep Separation Program coordinator	Daryl.Stepaniuk@gov.bc.ca	250-371-6327
	Dave Zehnder	Former BC Wild/Domestic Sheep Separation Program coordinator	dzehnder@telus.net	250-342-0325
	David Lewis	Contract Biologist for the Columbia Basin Fish and Wildlife Program	rdavidlewis@hotmail.com	250-347-6542
	Jesse Zeman	BCWF director/Co-chair of the wildlife allocations committee	jessezeman@shaw.ca	250-878-3799
	Jim Glaicar	Wild Sheep Society of BC/Vice-President	Jim.Glaicar@gov.bc.ca	250-961-1247
	Kevin Hurley	WSF Conservation Director/BC WSWG	khurley@wildsheepfoundation.org	307-527-6261
	Larry Ingham	Columbia Basin Fish and Wildlife Program Biologist	larry.ingham@bchydro.bc.ca	
	Scott Ellis	GOABC General Manager	ellis@goabc.org	604-541-6332
	Ian Adams	Senior Wildlife Biologist for Vast Resource Solutions	Ian.Adams@vastresource.com	250-426-5300
	Peter Stockdale	Past Sheep Biologist	pstockd@junction.net	250-838-6605
	Neil Thagard	FNAWS/Wild Sheep Federation	nthagard@trcp.org	208-861-8634
Producers	Barbara Johnstone-Grimmer	BC Sheep Federation/President	firhill@gulfislands.com	250-629-3819
	Bev Greenwell	BC Sheep Federation/Past-President	happyhollow@nethop.net	250-295-6419

APPENDIX B: Interview Questionnaire and Response Summary

Email:

The Wild Sheep Society of British Columbia (BC) is seeking your valuable input on the BC Sheep Separation Program (BCSSP). Coordinated by the BC Wild Sheep Working Group, the Program is administered by a collection of provincial wildlife staff and stakeholders associated with the management of domestic or wild sheep in the province. It was established to understand problems surrounding contact between wild and domestic sheep and to discover and implement solutions for dealing with contact issues.

You have been selected to participate in this survey because of your involvement with the BCSSP or the management of domestic/wild sheep. Filling out this survey will provide guidance to the program and is important for its future success. You are encouraged to complete the survey in its entirety, at your earliest convenience. All responses are anonymous.

The survey is comprised of 4 parts and has a total of 30 questions. It should take 10-20 minutes to complete and can be found at this link:

<https://www.surveymonkey.com/s.aspx>

This link is uniquely tied to this survey and your email address. Please do not forward this message. If you know of another stakeholder that should be included in this survey and has yet to receive one, please contact me and I will include them ad hoc.

Contact Andrew Walker if you have any questions, comments or concerns.

Andrew Walker, MSc., RPBio
604-485-4198
abdwalker@gmail.com

Thanks for your participation!

If you do not want to participate or receive future emails about this survey, you can opt-out via this link: <https://www.surveymonkey.com/optout.aspx>

Part 1: Stakeholder Involvement and Awareness

Rationale for Part 1: The goal of the survey is to determine the effectiveness of the BCSSP model, committee and to determine the value of a project coordinator. Individual stakeholder contribution to the BCSSP is varied and knowing the stakeholder's background will provide perspective on their involvement, awareness and evaluation of the program.

***1. What role did or do you play as a stakeholder of the BCSSP (choose as many as apply)?**

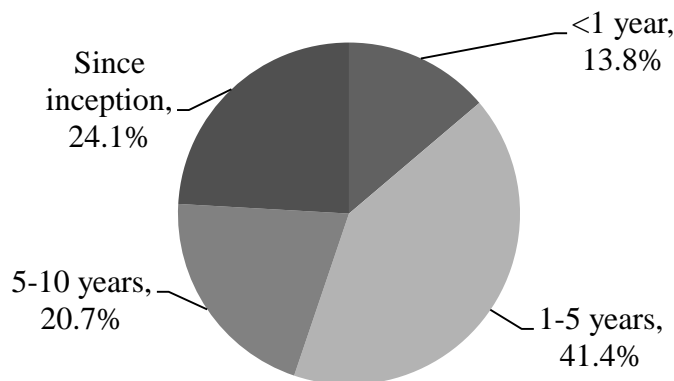
Answer Options	Response Percent	Response Count
Adviser	31.0%	9
Contractor	13.8%	4
Financial contributor	10.3%	3
British Columbia government staff	51.7%	15
Land owner	10.3%	3
Producer	17.2%	5
Project coordinator	17.2%	5
Volunteer	10.3%	3
Other (please specify)	13.8%	4
Total¹		29

¹The total reflects the number of respondents that answered the question and not the sum of the response count as multiple answers could be selected for this question.

All responses are unedited.

- Vet Pathologist and Recovery Program
- BC Sheep Federation
- Government Conservation Organization
- Member of the Rocky Mtn Trench Bighorn and Elk Valley Bighorn Committee

***2. How long were or have you been affiliated with the BCSSP?**



***3. Which region(s) of BC containing wild sheep does your past or current profession cover (choose as many as apply)?**

Answer Options	Response Percent	Response Count
Region 3 (Thompson-Nicola)	20.7%	6
Region 4 (Kootenay)	24.1%	7
Region 5 (Chilcotin)	6.9%	2
Region 6 (Skeena)	6.9%	2
Region 7A (Omineca)	6.9%	2
Region 7B (Peace)	6.9%	2
Region 8 (Okanagan)	20.7%	6
All of the Above	44.8%	13
Other (please specify)		0
Total¹		29

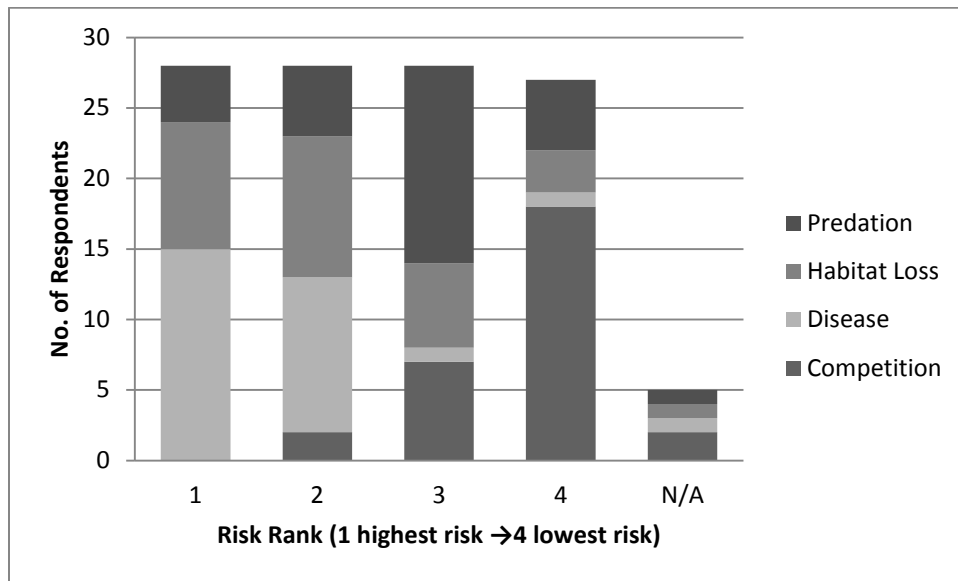
¹The total reflects the number of respondents that answered the question and not the sum of the response count as multiple answers could be selected for this question.

***4. As you know, the BCSSP does work throughout BC and we are interested in finding out how familiar you are with this work. From the following list, please choose which region(s) you are aware of, in which the BCSSP has been involved (choose as many as apply).**

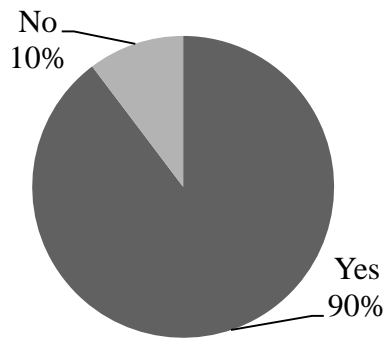
Answer Options	Response Percent	Response Count
Region 3 (Thompson-Nicola)	58.6%	17
Region 4 (Kootenay)	48.3%	14
Region 5 (Chilcotin)	48.3%	14
Region 6 (Skeena)	10.3%	3
Region 7A (Omineca)	3.4%	1
Region 7B (Peace)	3.4%	1
Region 8 (Okanagan)	62.1%	18
All of the Above	27.6%	8
Total¹		29

¹The total reflects the number of respondents that answered the question and not the sum of the response count as multiple answers could be selected for this question.

***5. From the list below, please rank, from greatest to least, which threat you think poses the biggest risk to wild sheep populations in BC (i.e. bighorn and thinhorn). Note: The survey program shuffles rows as ranks are applied.**



6. Do you believe the separation of domestic and wild sheep should be a priority for the management of wild sheep in BC?



Additional comments to the question (all responses are unedited):

- Separation must be defined - in my opinion it does not mean the implementation of Best Management Practices (BMP's) such as adding guard dogs or additional herders. Separation means that the risk of contact must be completely removed from wild sheep habitat. In other words, the vector must not be present.
- Yes but requires complex and careful management based on ecological and historical principles

- A qualified no. Wild sheep management should include keeping the wild sheep wild, and part of that is working towards a physical separation of wild and domestic sheep. It is also important to provide and maintain habitat and minimize "management".
- Research is sound, wildsheep + domestic sheep=dead wild sheep
- It is LIKED to be believed that domestic sheep are a problem, however it is also KNOWN amongst sheep producers that Bighorn come into contact with no problem occurring, ie Kamloops area.crosses are seen quite regularly??? Habitat loss and changed movement/feeding/watering corridors due to deer fencing , highways and urban development are probably a stronger limiting factor. Then comes over population in areas where enhancement is taking place and the sheep have to move into areas not normally theirs. habitat loss or interference ie increased number of deer fences for vineyards/orchards etc makes it more difficult for big horn to get water/winter feed/shelter etc.
- Due to catastrophic die off of wild sheep after contact. Politically sensitive but the value of wild sheep far exceeds that of the domestic sheep industry.
- Don't know what all the options are. A key issue is covering the cost of the separation program especially if it is fencing.
- Legislation and bylaws are the most cost effective way until that happens mitigation will have to be done on a farm by farm basis
- It should be a priority, but realistically it is not possible, due to physical, financial, and political issues.
- More so in some areas than others.
- I believe that it is critical to the long-term viability and existence of thinhorns.
- Many herds may not be viable if effective separation not achieved
- Past exposures have been disasterous and we still have areas of great concern for potential contact in the future

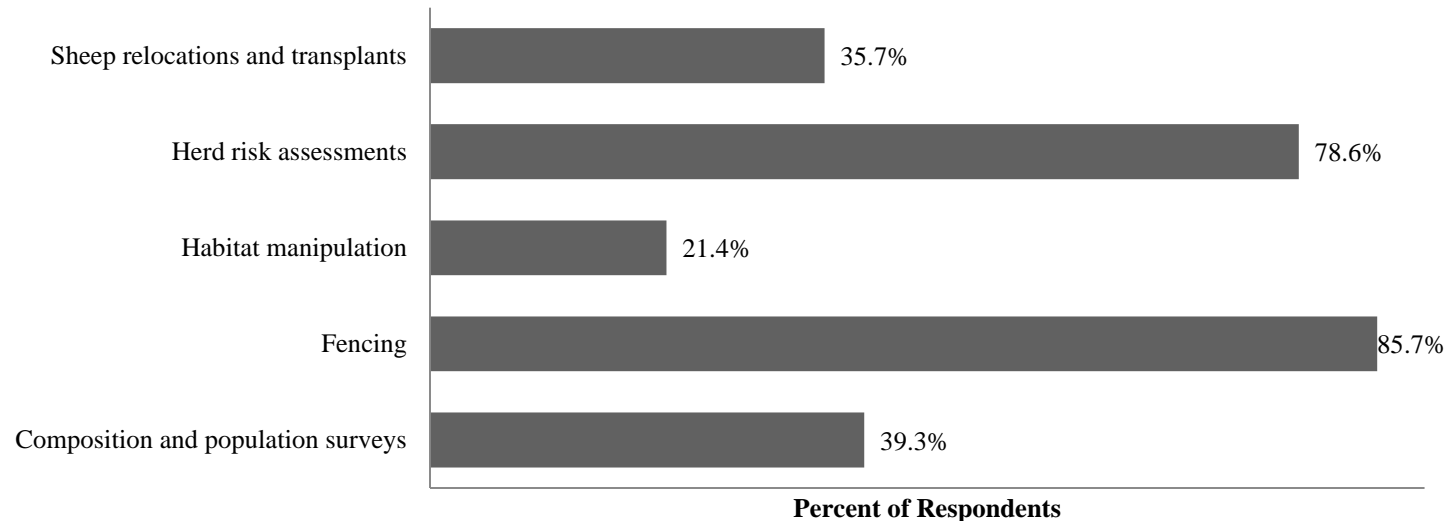
Part 2: Model Effectiveness

Rationale for Part 2: Since 2005, the BCSSP has used a 7 step approach to achieve its goal of "reducing the risk of disease transmission by minimizing or preventing association between wild and domestic sheep or goats in the province, on both private and Crown lands". The following section is intended to evaluate the approaches used to achieve this goal.

***7. How important do you believe each of the following approaches is to achieving the BCSSP goal?**

Answer Options	Not important at all	Somewhat unimportant	Neutral	Somewhat important	Extremely important	Rating Average	Response Count
1) Developing and maintaining an effective stakeholder committee,	0	0	2	7	19	4.61	28
2) Field work involving composition surveys, habitat enhancement and risk assessments,	1	1	2	14	10	4.11	28
3) Identification and mapping of domestic livestock producers in risk areas,	0	2	1	4	21	4.57	28
4) Education and communication of disease risks to public,	0	0	0	5	23	4.82	28
5) Developing and delivering of mitigation option lists for domestic livestock producers,	1	0	0	10	17	4.50	28
6) Presentations to local government regarding disease risks,	1	0	2	7	18	4.46	28
7) Assisting First Nations in drafting resolutions to reduce disease risk between wild domestic sheep and goats on traditional land.	1	0	7	9	11	4.04	28

8. In your experience, what type of field work has been initiated and administered by the BCSSP (choose as many as apply)?



Additional comments to this question (all responses are unedited):

- The most important is BCResolutions from individual Bands (ONA), FNLC (UBCIC, FNS, BCAFN)..... lets not forget that major contribution and tool.
- The program has assisted in relocations and transplants but not initiated them
- none in this area
- guardian dogs; buyouts (purchasing domestic flocks with agreements for landowner to not re-establish a domestic flock)
- Profit a pendre to convert a domestic producer to hay also education
- Some inventory and transplants in Region 3 were funded by the WSSOBC but, not to my knowledge, from the BCSSP budget.
- In Region 4 we have conducted inventories, transplants and habitat work but more for improving the overall health of sheep populations not in response to a disease outbreak. We haven't had a disease outbreak since 1980's.
- Risk assessment tool not complete but was somewhat functional and near complete from what I can recall - we used it to rationalize a project in the past
- Education and communications with various user groups

9. From the list below, please choose what type of maps you are familiar with that have been produced for tracking domestic sheep farms and herds in high risk areas (choose as many as apply)?

Answer Options	Response Percent	Response Count
Hand drawn	32.1%	9
Paper maps with locations	57.1%	16
GIS based digital maps	60.7%	17
Other (please specify)		7
Total¹		28
Skipped question		1

¹The total reflects the number of respondents that answered the question and not the sum of the response count as multiple answers could be selected for this question.

Additional comments to this question (all responses are unedited):

- I have not seen any of the maps and do not know how to access them.
- System forced a response- however, I am not familiar with what has been done.
- Could not check 'other'. I don't know what has been done. We do not have maps. We have GPS locations of domestic sheep producers but have not mapped them. Also the producers have not been visited since 2009 so list needs to be updated.
- None seen so not familiar
- Don't recall seeing any maps produced from this program in recent years. Only 1 map that I am aware of was from an earlier version of this program, completed by some BCCF students and was very limited in its geographic scope.
- Brian Harris and Bill Jex have had maps made for bighorns and thimhorn ranges and conflict zones.

10. What media have you used, or are you aware of being used, to educate or inform people about BCSSP (choose as many as apply)?

Answer Options	Response Percent	Response Count
Brochures/Posters	64.3%	18
Email	60.7%	17
Mail	10.7%	3
Meetings (i.e. face-to-face, conference call)	78.6%	22
Newspaper	25.0%	7
Phone	35.7%	10
Public Meetings	32.1%	9
Radio	17.9%	5
Social Media (e.g. Facebook, Twitter, etc.)	0.0%	0
TV	14.3%	4
Websites	35.7%	10

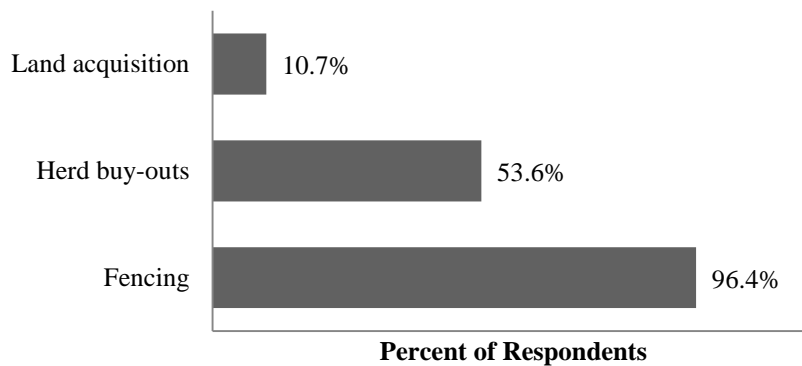
All of the above	0.0%	0
Other (please specify)		4
Total¹		28
Skipped question		1

¹The total reflects the number of respondents that answered the question and not the sum of the response count as multiple answers could be selected for this question.

Additional comments to this question (all responses are unedited):

- Meetings with specific interest groups- Domestic Sheep Producers(BC Sheep Federation), First Nations, Rocky Mountain Trench Bighorn Sheep Working Group, Wild Sheep Society
- System forced a response- however, I am not familiar with what has been done.
- producers newsletters
- Conferences and AGMs

11. To the best of your knowledge, what mitigation options have been developed and delivered to domestic producers (choose as many as apply)?



Additional comments to this question (all responses are unedited):

- Buy-outs are a good option on private lands, or livestock conversions (i.e. cattle, horses, etc)
- Conservation Covenants - lets deal with the ALR lands now through the ALC....
- The program has assisted in emergency response to reports of direct contact of dom. and wild sheep
- 1 fencing, 1 buy out. Do we want Agriculture in this province or not? We have land set aside as an Agriculture land reserve, is it all of a sudden, privately paid for green space and game preserve for guide outfitters, hunters and tourists? The enhancement programs also burden farmers with paying for their winter feed when they arrive in OUR hayfields all winter. And we all pay when ICBC forks over \$ for vehicles hitting them on highway.
- none in this area
- guardian dogs
- Herd conversions and education we will be trying electric fencing in Chasm
- None of these options were carried out in Region 3. Possibly some or all in the Okanagan.

- In Region 4.
- Education and information

12. To the best of your knowledge, which First Nations have passed bylaws regarding the separation of domestic and wild sheep?

All responses are unedited.

- not sure of any.
- PIB, LSIB, USIB, OIB, WFN, ONA, FNS, UBCIC, BCAFN
- Jonathin Kruger of the Penticton Indian Band was working with Darrell Stepanuik. The program has also worked with the Kamloops Indian Band. Bill Jex has been working with First Nations in the North. Efforts have also been made to engage the Ktunxa in the East Kootenay.
- I do not know.
- Unaware
- none ?
- Penticton Indian Band - others are supportive of bylaws
- none in this area
- All in BC
- None that I know of KIB may have looked at it as well as pentiction
- none that I'm aware of
- do not know
- Indian Bands of the South Okanagan and Similkameen, ONA, Union of BC Indian Chiefs, First Nation summit
- ?
- None in Region 4
- Not aware but likely Penticton
- Penticton Indian Band, possibly ONA
- Kamloops Band (?) in cooperation with Jeff Morgan. The Cassiar Iskut-Stikine had First Nations involved as stakeholders in its establishment that saw the prohibition of grazing domestic shee and goats on crown lands within that LRMP area.
- Unaware of any

13. The BCSSP has initiated several projects including property fencing and public education. From your involvement with the program, where do you believe most of the information collected or stored for these projects reside(s) (choose as many as apply)?

Answer Options		Response Percent	Response Count
Individual field notes or filing cabinets	Individual field notes or filing cabinets	71.4%	20
Individual computers	Individual computers	60.7%	17

Existing government database	Existing government database (i.e. Provincial Wildlife Inventory Database)	32.1%	9
Non-government website/server	Non-government website/server (e.g. WSSBC, BCWF, GOABC, etc.)	28.6%	8
All of the above	All of the above	17.9%	5
Other (please specify)	Other (please specify)	6	6
Total¹			28
Skipped question			1

¹The total reflects the number of respondents that answered the question and not the sum of the response count as multiple answers could be selected for this question.

Additional comments to this question (all responses are unedited):

- ?
- unknown?
- System forced a response- however, I am not familiar with what has been done.
- The coordinator Dave Zender
- I'm guessing on this one.
- Old coordinator of the program probably has some of this info

***14. Listed below are a few approaches that have been used to achieve the BCSSP goal. Please rate each of the approaches below based on how effective you think they have been in achieving the BCSSP goal of "reducing the risk of disease transmission by minimizing or preventing association between wild and domestic sheep or goats in the province, on both private and Crown lands".**

Answer Options	Not at all	Slightly	Moderately	Significantly	Completely	N/A	Rating Average	Response Count
1) Developing and maintaining an effective stakeholder committee,	1	5	8	12	1	0	3.26	27
2) Field work involving composition surveys, habitat enhancement and risk assessments,	3	2	8	10	1	3	3.17	27
3) Identification and mapping of domestic livestock producers in risk areas,	1	1	10	11	3	1	3.54	27
4) Education and communication of disease risks to public,	1	5	11	9	1	1	3.15	28
5) Developing and delivering of mitigation option lists for domestic livestock producers,	1	6	11	8	1	1	3.07	28
6) Presentations to local government regarding disease risks,	1	10	12	3	0	1	2.65	27
7) Assisting First Nations in drafting resolutions to reduce disease risk between wild domestic sheep and goats on traditional land.	5	5	8	5	1	2	2.67	26

15. If you believe an approach has not been effective, please explain why?

All responses are unedited.

- Separation must be better defined and implemented. Also, it is very clear under the latest research that wild sheep cannot exist with domestic sheep.
- Not appropriate to mention herein.
- Funding has limited the ability to implement the necessary comprehensive approach. 2010-2011 the funding for the program was 1/2 of the previous 4 years and the 2011/2012 year's work has been unfunded
- The stakeholder committee does not include the BC Sheep Federation, a body of domestic sheep organizations that represent the interests of sheep producers. We need to be at the table to help provide solutions and be part of the education process so vital. It is impossible to enforce the type of bylaw you are discussing. Wild and domestic sheep have been interacting for over 100 years. To try to stop that now is impossible. Also, how large do you hope the wild population will get. What if the wild population encroaches on land that did not use to have wild sheep. Would those sheep farmers have to leave? The average sheep farm has only 36 breeding ewes. That means most farms have less than the 25 your bylaw has arbitrarily decided makes a good or bad sheep farmer. Do you know anything about sheep? Or people? Do you know how many small farms are out there? Lots, most don't even report as farms and as more rules come in those farms go even more underground which isn't good for anyone. Every sheep producer I know does not want anything bad to happen to the Wild Sheep population but your approach of attacking sheep producers is misguided and impossible to enforce.
- I don't know of any first nations land with a domestic sheep flock. Most nose to nose contacts have occurred outside of the high risk zones. ie in Princeton and Kelowna in past several years. In Kamloops, 3 days before a Env person arrived, ram was long gone.?????
- Education continues to be lacking regarding the risk to wild sheep from even small domestic sheep operations. the relative economic benefit of wild sheep vs/ domestic sheep is also poorly understood and the extremely high value of wild sheep is consistently down played.
- approach #2, in itself, does not prevent contact
- the approach has not worked as we have a large committee, made up of mostly gov't people, who look to ngo's for funding, the co-ordinator position , largely funded by WSS has reported directly to no one, has no deliverables or guidelines nor direction, basically a large rudderless ship
- #2 is not a good question. Those are three very distinct and separate tasks with different applications to SSP, so the answers to your question are meaningless. Risk assessment is critical for this project. Composition surveys is a role mostly for Government. Habitat enhancement is a good idea for all species, but it is NOT critical to this program. The same comments for question 7 above, but there was no comment box.
- Not familiar with all that has been done in the south. In the north (where there are less issues) less has been done, but it would be good to get ahead of the game in the north before domestics become more prevalent near wild sheep habitat.
- Lacks focus, a co-ordinated approach, resources, short-term solutions and the co-ordinator is not effective.
- Lack of reliable funding to adequately fund a coordinator and initiatives.

- No comment
- Nothing really has been effective because the program spins its wheels without funding for achieving short term separation at least. Achieving long term separation has been a long road and we'll maybe never get there across bighorn range in the south
- It has to date been focused just in the Okanagan/south and therefore has left the thinhorn herds on their own with only Wildlife Branch staff to lobby for. I think it would be beneficial to develop better linkages with BCWF & GOABC (tell them each to grow up a bit and leave their distain for each other outside) because they should both be forefront in supporting the WSS in this major conservation effort.

16. What other approaches do you think should be considered?

All responses are unedited.

- Internal gov briefings - you can present and develop all the strategies you want with local gov's, but the legislative relaiity is that its up the Minister responsible for Agriculture to make these decisions... lets not forget about that...
- following through with the implementation of the regional bylaw, the Paid Ecosystem Services tool needs to be developed further to aid in mitigation
- Wild habitat for wild animals; do not feed them, habituate them to people, make them dependent on alfalfa fields etc. Push them away from our farms. Education should go both ways, and any education program should include the BC Sheep Federation for its development and delivery. Research on the biology of wild sheep; there is research to indicate that a certain amount of die off is expected as herds increase in numbers and density.
- Legislation to prohibit domestic sheep producers within certain distances of wild sheep
- education communication action when contact is reported.
- Direct engagement with Provincial government, direct interaction with "smallholders" more graphic public education (including TV ads) showing the extreme risk of disease transmission. many small farmers are imply unaware of the risk to wild sheep and this is viewed as alarmist and easily dismissed.
- Legislation is the ultimate goal as well as regional support from regional districts
- Encourage research into the wild sheep disease carrier theory. Otherwise I believe that approaches 3, 4, and 5 above are the highest priority.
- A firm set of guidelines/job description for the co-ordinators position, more cooperation from regional bio's in deferring wild domestic issues to the position, currenty the position is used when regions are unable to deal with the issues, thus leaving it to late for the co-ordiantors position to be useful
- more foccused approach on diseaase risk mapping and funding to enable education and outreach
- Legislation
- Notes from Dave Zehnder: A new initiative known as the Ecological Services Initiative is focused on paying producers for providing services from their land base such as critical bighorn sheep habitat. The initiative has been well received by a number of funders and researchers. It shows promise in being a useful tool to facilitate critical habitat enhancement and securement. It could be used in conjunction with the bylaw. Paid ecological services

combined with a sheep zone bylaw could be incorporated into the Regional District Agriculture Plans and how this might be used to secure portions of Ag lands for critical Bighorn Sheep habitat.

- No suggestions
- I believe the coordinator role should be within government so that funding does not become a limiting factor to whether work is being done or not.
- In the short term, I think we need to investigate and conclusively test more cost effective methods of achieving physical separation and then track down the funding to deliver in high-risk situations. Use what we know works where its cost effective and makes sense to do (i.e., traditional double fencing).
- Rezoning of agricultural lands to reduce risk of contact. Provincial legislation with mandates and regulations to stop potential risks from domestic sheep and goats within and adjacent to wild sheep ranges.

Part 3: Committee and Coordinator Effectiveness

Rationale for Part 3: Success of a stakeholder committee is related to a stakeholder's perception of project value and their relationship to the project team. The project's success is often affected by how well the stakeholder expectations were met and is influenced by the coordinator's ability to engage/communicate with stakeholders and manage organizational politics. This section looks at committee and coordinator function, based on 5 operational principles of stakeholder engagement for a functioning stakeholder committee:

- 1) Communication: Open and effective engagement involves both listening and talking.
- 2) Transparency: Clear and agreed information and feedback processes.
- 3) Collaboration: Working cooperatively to seek mutually beneficial outcomes.
- 4) Inclusiveness: Recognize, understand and involve stakeholders early and throughout the process.
- 5) Integrity: Conduct engagement in a manner that fosters mutual respect and trust.

17. In your experience, please rate how well you think the BC Wild Sheep Working Group has functioned?

Answer Options	Not at all	Slightly	Moderately	Significantly	Completely	Rating Average	Response Count
1) Communication: Were suggestions accommodated and other stakeholder information shared?	1	6	9	8	0	3.00	24
2) Transparency: Was collected information documented and attainable?	2	5	8	8	1	3.04	24
3) Collaboration: Did the committee work cooperatively toward common goals?	2	2	6	14	1	3.40	25
4) Inclusiveness: Were people kept up-to-date and involved in the process?	2	6	11	6	0	2.84	25
5) Integrity: Did the committee foster respect and trust?	1	3	8	12	1	3.36	25

***18. For each of the approaches listed below, please rate how well they were serviced by the BC Wild Sheep Working Group?**

Answer Options	Not at all	Slightly	Moderately	Significantly	Completely	N/A	Rating Average	Response Count
1) Developing and maintaining an effective stakeholder committee,	1	1	15	6	1	4	3.21	28
2) Field work involving composition surveys, habitat enhancement and risk assessments,	3	5	7	7	0	6	2.82	28
3) Identification and mapping of domestic livestock producers in risk areas,	1	4	7	12	1	3	3.32	28
4) Education and communication of disease risks to public,	1	7	13	4	0	3	2.80	28
5) Developing and delivering of mitigation option lists for domestic livestock producers,	4	3	10	6	1	4	2.88	28
6) Presentations to local government regarding disease risks,	2	9	7	6	0	4	2.71	28
7) Assisting First Nations in drafting resolutions to reduce disease risk between wild domestic sheep and goats on traditional land.	7	6	6	3	1	5	2.35	28

19. Were there any groups you think may have been underrepresented or absent from the working group committee (i.e. government, non-governmental organizations, First Nations, producer, etc.)? If yes, please list which groups were underrepresented.

All responses are unedited.

- Governemnt Agriculture reps, including a major player being the ALC - ALC needs to come of the table The others are FN's and the strength of that cannot be underestimated, which it has been post-2005 to date.
- First Nations were under representeted although Darrel Stepaniuk advised the group that he would act as a leason on the issue.
- BC Sheep Federation
- No
- Producers. rarely were producers included.
- The actual sheep industry/ producers and esceppcially hobby farmers - the smallest group but arguably the highest risk.
- Domestic sheep producers, most notably absent...
- poor representation of FN and producer groups
- First Nations and producers because they do not have an organization representing them it was always one producer
- regional and municipal govts and first nations
- domestic sheep producers and ngo's are under represented, to top heavy with gov't beaucrats
- I believe most groups were invited and most attending annual meeting however difficult to maintain relationships with non-government reps as funding was not adequate to pay for travel costs or coordinator's time to conduct more than an annual meeting.
- First Nations
- Might have been useful to have a rep from provincial domestic sheep association
- Agriculture Ministry and Producers

***20. Please rate how well each of the approaches below were serviced by the project coordinator.**

Answer Options	Not at all	Slightly	Moderately	Significantly	Completely	N/A	Rating Average	Response Count
1) Developing and maintaining an effective stakeholder committee,	2	3	11	4	0	7	2.85	27
2) Field work involving composition surveys, habitat enhancement and risk assessments,	2	6	9	2	0	9	2.58	28
3) Identification and mapping of domestic livestock producers in risk areas,	1	6	10	5	0	6	2.86	28
4) Education and communication of disease risks to public,	3	2	15	2	0	6	2.73	28
5) Developing and delivering of mitigation option lists for domestic livestock producers,	3	4	11	3	0	7	2.67	28
6) Presentations to local government regarding disease risks,	2	5	12	2	0	7	2.67	28
7) Assisting First Nations in drafting resolutions to reduce disease risk between wild domestic sheep and goats on traditional land.	6	5	7	2	1	7	2.38	28

21. From the best of your knowledge, were there other tasks outside of the model approaches, that were facilitated by a project coordinator (e.g. fundraising)?

All responses are unedited.

- Fundraising has been lacking for years - this is a major component to any project - there is a dire need to re-invigorate the level of financial support and strength the project once had.
- Facilitating the development and maintenance of the BCSSP Strategic Plan. Assisting with fundraising. Assisting to emergency response to reported contact situations such as the Princeton situation where three wild ewes were destroyed to avoid transmission.
- Unaware
- ?
- One coordinator did significant fund raising, the other not, one did much work with FN, the other not. One better with producer groups but no documentation Neither documented info well at all
- We tried to leave that with the steering committee
- I don't know. With respect to question #20, I was not familiar enough with the project coordinator's work to rate his performance. On average, I would guess the service was average, but this may have been the result of an inadequate budget, time constraints, difficulties with getting committee members together and on task, etc.
- no, present co-ordinator did no fund raising, did apply to hctf and that was it, very ineffective both in the job and in fund raising
- fundraising. contact with specific producers. coordinated specific projects (e.g. fencing). maintained contact with US agencies.
- ?
- I believe that coordinator attempted to fundraise.
- I know the coordinator tried some avenues and wasn't generally successful. Likely many other avenues not explored. Difficult job for anybody to do though as the amount of money needed to throw at current approaches is generally not practical to raise

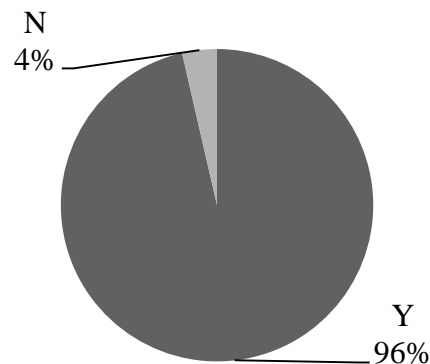
22. In your opinion, could the project coordinator's position be improved?

All responses are unedited.

- In moving forward, more outreach through media venues will be important - the use of Facebook, Twitter, TV, Radio, etc.
- Yes, in many ways.
- Consistent funding, with a clear agreement and support for a annual Work Plan and Budget, based on the groups developed Strategic Plan.
- Who is the project coordinator.
- We still have domestic sheep near wild sheep, so yes
- ?
- Higher profile, direct engagement with ADM level or above in the Provincial Govt.
- Yes
- yes - with a full job description and goal posts

- Yes
- With adequate resources and commitment from committee members, yes.
- absolutely, it needs to be funded by gov't 1/2 fte, have clear expectations and job description and report directly to a small body
- what are you asking? Could the coordinator have delivered more? fundraised more? coordinated more research? improved communication? Yes to all.
- yes,
- Yes, get rid of the fencer, work on a long-term solution.
- Yes.
- Probably
- Again, I don't think we should have a coordinator position that depends on funding. Funding acquired should go directly into mitigation projects.
- The coordinator has to be part lobbyist and needs to use the linkage the WSS has with others and other groups to force the issues and provide for the enactment/legislative changes that will facilitate the by-laws at the Regional District level. Input at the ADM level of gov't is likely the easiest and then leverage that to the Minister level.

***23. Do you believe the project coordinator's role is important for the BCSSP?**



All responses are unedited.

- This role is the cornerstone for success - always has been - not only for the project, but for this spp broadly...
- ?
- For a project with as broad a geographical scope as this, an overall coordinator is essential. Having someone dedicated to this task is equally important. A government biologist likely has far too many other responsibilities and this important work would risk being unintentionally neglected
- very important
- crucial, gov't and ngo's do not have the time or resources to deal with the domestic wild issue on a daily basis
- I think that you need a provincial coordinator position and a "field" position for each Region. For example: the provincial coordinator supervises the field position, fundraises, attends

major meetings, works with governments, and writes annual reports. The field position would update producer databases, visit producers, attend local meetings, deliver mitigation options.

- The coordinator has to have an accomodating personality to bring the different stakeholders together for achieving consensus. Get the personality "turf conscience"
- Very important - regional wildlife staff do not have the time required to invest in tracking domestic sheep occurrence and achieving effective separation
- Coordination is very important but it can't be done by regional bios off the side of their desk. There needs to be consistant level of attention perferably by one organization (Agriculture Wildlife Specialist??)
- I recognize that funding has reduced teh ability of the coordiantor to function, improved funding and more focused efforts (let gov't staff handle gov't stuff as in-kind contribution), could improve the successes of the role.

Part 4: Future Direction

Rationale for Part 4: The Wild Sheep Society of British Columbia has commissioned this review of the BCSSP in order to assess the program's effectiveness and to seek approaches for directing the program moving forward. The future direction of the program will rely on a number of decisions that this sections hopes to clarify.

***24. From the following list, please choose which region(s) you believe the BCSSP should target (choose as many as apply).**

Answer Options	Response Percent	Response Count
Region 1 (Vancouver Island)	7.1%	2
Region 2 (Lower Mainland)	3.6%	1
Region 3 (Thompson-Nicola)	28.6%	8
Region 4 (Kootenay)	32.1%	9
Region 5 (Chilcotin)	21.4%	6
Region 6 (Skeena)	21.4%	6
Region 7A (Omineca)	14.3%	4
Region 7B (Peace)	14.3%	4
Region 8 (Okanagan)	39.3%	11
All regions containing wild sheep	67.9%	19
All regions of British Columbia	10.7%	3
Comment		10
Total¹		28
Skipped question		1

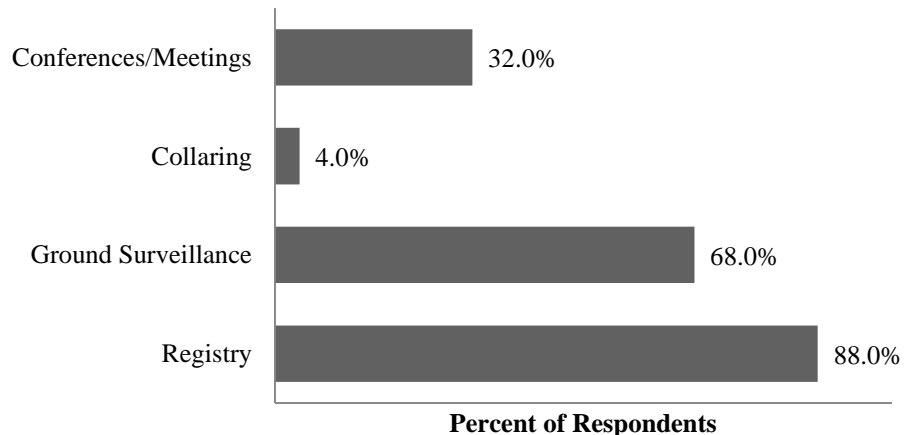
¹The total reflects the number of respondents that answered the question and not the sum of the response count as multiple answers could be selected for this question.

All responses are unedited.

- Focus on the politics, that mainly comes from the stakeholder organizations and interested parties, this also includes the power of the "stakeholder committee" - second, look at the demographics and "paradigm" of change (lower mainland) - third, use the RDOS bylaw as a precedence, this is a MUST for success - fourth, re-start the Aboriginal movement and carry that through... lastly, your coordinator, MUST be the right person, search hard and thorough.
- All Regions with Wild Sheep should be targeted, but the approach should be specific to the needs of the individual region. Example: In a Region with a large number of dom. producers the focus needs to be on mitigation but in a Region with no dom. producer the emphasis should be placed on prevention.
- You assume this is the only way to go which is why you give no opportunity for opposition.
- All areas containing domestic in close proximity
- I don't believe separation is your biggest problem. natural die offs occur in all populations, particularly when other stresses are put upon them such as loss of habitat, predations, extreme winters/summers etc.

- Disease risk through contamination with domestic sheep is a concern wherever both domestic and wild sheep are found
- Region by region basis and focus on local involvement. Make sure herds are mapped well. BC is ecological repository of the world.
- Important to focus on areas where problems currently exist, but also important to be preventative in areas where problems don't exist yet, but could in the future.
- More of an issue in Regions 3,4,5&8 but potential exists in the north as well
- Prioities to checked regions but efforts in all regions that have sheep. Some work is being undertaken by gov't staff so this position owuld be support to those and then would act as lead in areas where no current efforts are underway.

***25. In your opinion, what is/are the best way(s) to keep track of DOMESTIC sheep locations (choose as many as apply)?**



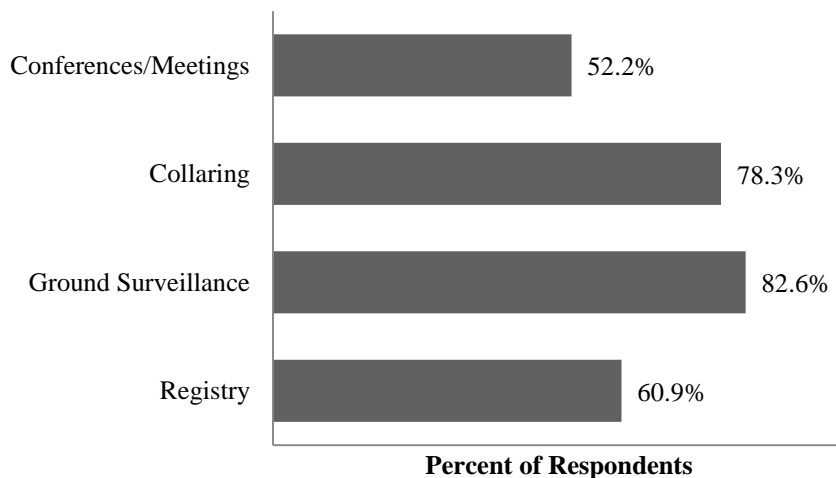
All responses are unedited.

- I tagged, conference and meetings for this specific purpose: If you had a functioning stakeholder committee that included a strong representation from industry, this would be second nature for them to update the group.... you need trust before that happens although...
- It is important to keep in contact with producers . One good source of producer locations in the past has been local sheep shearers since they know where the flocks are
- This is impossible.
- collaring domestic sheep? MY Sheep on My property by special interest groups????? you are treading on privacy laws of Canada. be careful!
- database of DS operations; records from local agricultural agents, brand inspectors, MFLNRO personnel, BC Sheep Federation records
- Best to avoid required registry for domestic sheep - but this requires cooperation from the sheep producer / owner community. If a willingness is not shown to cooperate in minimizing risk of contact with domestic sheep, the a registry should be considered. In the meantime, work with sheep shearers to be aware of domestic sheep flocks, ongoing outreach via 4H

clubs, schools, information being made visible and available at feed stores and other agricultural service providers (e.g. equipment dealers)

- Ongoing ground and air surveillance by govt staff; observations from hunters, WSSOBC members, naturalists, first nations, natural resource industry workers, etc, and any members of the public interested in healthy wild sheep populations. A registry (voluntary?) could be created (by BCSSP?) from information provided from above as well as from 4H and livestock breeder associations and provincial agriculture and range mgt branches.
- Question is what number constitutes a farm and requires registration.
- M.Ag should have a list of producers, no?
- Difficult task to keep track of with current methods (observations during regular field work, word of mouth, etc.) as all it takes is for some random person to bring in a couple domestic sheep for a short time period and then get rid of them. We never know and the damage may be done.

***26. In your opinion what is/are the best way(s) to keep track of WILD sheep locations (choose as many as apply)?**



All responses are unedited.

- Aerial surveys as well. Also, a GIS database must be developed showing WS habitat based on terrain, slope, observation, etc.
- Maintain regional databases
- make all wild sheep sign a registry and buy a license to cross onto private lands.
- ... with a process that enables the recording of sightings made by the public
- Ongoing population monitoring and winter range use. Likely ground surveys in the long term. For any wild herds whose range is poorly understood, an initial collaring program may be advisable.
- Inventory flights
- same as in #25. Wildlife branch staff should manage this data base.

- No historical record of sheep in an area - the sheep should not be relocated or promoted in an area. Collaring only if benefits outway
- aerial surveys
- aerial surveys
- Advocate for long-term funding for wildlife management in BC
- Regional biologists know where sheep occur and where they potentially might occur. Aerial surveys also contribute this information. The best way is the route already taken - have regional biologists identify high-risk areas in bighorn range based on what they know of sheep distribution and go from there.
- Regulate Inventory Methods (aerial survey and ground counts)

27. What do you think is the most effective way to separate domestic and wild sheep in perpetuity?

All responses are unedited.

- Once the WS habitats are identified, there should be no domestic sheep within or around those areas, which means buffers must be established outside of WS habitat.
- Agricultural zoning restrictions, combined with wildlife and habitat zoning... with a buffer zone around that zoning - this would actually be a restriction to both industry and wildlife - in the end its a quid pro quo and balance btw both - both sides have then showed give and take etc... I'm not talking about fencing restrictions or herd composition, but rather - NO domestic zones and NO Bighorn/Thinhorn zones, based on habitat etc
- Bylaw with special sheep management zones.
- legislation
- By leaving the wild sheep alone! in their own habitat. Protect their habitat from encroachment. Limit kills by not issuing hunting licenses. Fence highways. Fence crown lands.
- Fencing and bylaws that prohibit farming of small herds or any farming without separation measures. better education of small holders is needed - they may voluntarily switch herd species if they know how risky domestic sheep are to wild sheep.
- education, legislation
- Education as to potential risks from contact
- education of producers, seeking alternatives and testing them and support for research
- enact legislation to prohibit domestic sheep ranching within a potential contact zone - like (I think) exists around wood buffalo park to keep cows separated from bison to reduce transmission of brucellosis etc
- Identify all generalized locations where wild sheep are most likely to come into contact with domestic sheep. i.e. low elevation winter ranges and traditional migration routes or areas where domestic sheep may be on summer pastures also used by wild sheep. Local gov't and BC Ag ministry staff should seriously consider making these overlap areas 'out of bounds' for domestic sheep. At the very least, domestic sheep producers/owners should have to demonstrate that significant due diligence has been taken to reduce risk of contact to essentially zero. In particular hot spots, consider conservation covenants where a landowner

may agree to place on the land title that no domestic sheep be held on that property. This situation would be rarely used.

- Legislation and working with AG to come up with best practices for this
- I don't think it's feasible or possible unless there's some incredible breakthrough in the management or elimination of the disease. We can reduce the risk of transmission from domestics to wild sheep through education, communication, ongoing monitoring of domestic sheep and goat locations, etc, but the risk has been, and always will be there. Wild sheep populations are expanding and numbers of domestic sheep and goat operations are increasing, and keeping them separated everywhere is physically impossible. Fortunately, wild sheep have and will continue to recover on their own after disease transmission. We can only hope to reduce the frequency of infections through the approaches listed above.
- legislation not allowing domestics to be in wild sheep territory
- Fencing on the margins of wild sheep habitat and no domestic sheep within 15 mile buffer of native sheep herds.
- There is not a best way to achieve separation. We need a bunch of tools.
- education
- Ensure that domestic sheep farms are kept a sufficient distance away from wild sheep, and where they are not ensure adequate fencing is in place.
- Legislation
- stable annual funding for the program no Crown grazing of domestic sheep in bighorn sheep habitats fencing when required bylaws education
- By-laws that apply to buffered high-risk habitat
- Regulation
- Implement a moratorium on domestic sheep and goat production in areas near (30km buffer) wild sheep range. This is greatly supported by the economic contribution to BC of wild sheep vs domestics. Grandfathering of existing operations with no-transfer policy (i.e., when the current owner passes away, sells their stock, or their property, the stock cannot be transferred and must be removed). For these situations only, there should be a requirement to install double fencing within 1 year, cost-shared with gov't 50/50.
- Rezoning agricultural lands to avoid conflicts between domestics and wild sheep. Have Provincial legislation in place with regulations to stop potential contact of domestic and wild sheep populations.

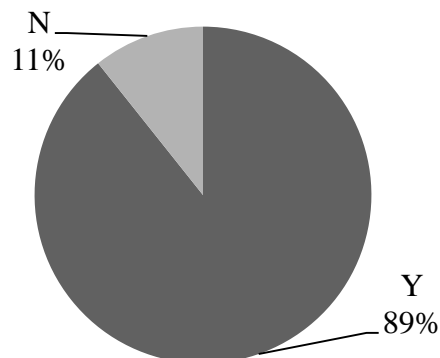
***28. Rate the following items on how you believe they would improve the BCSSP effectiveness (choose as many as apply)?**

Answer Options	Not at all	Slightly	Moderately	Significantly	Completely	Rating Average	Response Count
Improved documentation and storage of information	1	2	8	14	3	3.57	28
Improved public education and societal awareness	0	1	3	13	11	4.21	28
Secure funding source	2	0	4	14	8	3.93	28
Separation legislation	3	0	2	10	13	4.07	28
Other (please specify)							6

All responses are unedited.

- Be careful with developing legislation to manage wildlife - this is a very slippery slope.
- Work closer with FN's
- working group engagement
- strong policy / political support from all applicable provincial ministries: wildlife, lands, agriculture
- Funding source becomes more important with less and less government staff
- The legislative changes package is already underway but could use support from WSS and others.

***29. Do you see the BCSSP playing a valuable role in the future management of healthy wild sheep populations in British Columbia?**



All responses are unedited.

- the values of having BCSSP - it will keep this issue alive when it might be ignored by government when something else comes along that takes precedence - it will serve as a focus for information storage and dissemination
- to a certain extent. The role of the BCSSP in minimizing risk of disease transmission via contact with domestic sheep is one of the factors to be considered in wild sheep management in B.C. Many other factors influence the status of wild sheep populations - harvest, habitat (e.g. ecosystem restoration particularly on low elevation winter range), other livestock grazing, predator monitoring.
- through coordination, facilitation, and education and communication with stakeholders and land owners.
- Should be looked at as a practical outcome for the good of British Columbians.
- provided it is adequately funded otherwise it will continue to spin its wheels
- I understand the intent of BCSSP but so far we have failed to demonstrate that the groups can deliver. I also like the idea of a nongovernment group for approaching domestic farmers but I can't see how this will work without consistent funding and affordable and effective coordination. There has been little or no action outside of regional bios working to mitigate direct threats or push regulations issue up to executives. Tough situation. I've always through this would be a good fit for PAZWP coordination and BCSSP playing a communication and outreach role.
- Without it our wild sheep populations are a ticking time bomb.....

30. Do you have any additional comments that have not been captured in this survey?

All responses are unedited.

- Question 7 was somewhat misleading: 7 (6) - you can do all the meetings and work with reg govs, but it comes down to the Min resp for Ag in teh end... 7(2) - Much mapping has been completed in portions of the Province - we need real and tangible outcomes now - focus on

the industry and gov associated with industry including the ALC 7(7) - "Traditional Lands" is a watered down way of the rights spectrum. This is not about a paradigm shift, its really about becoming less ignorant o the legal realities and paramountcy of law. This is and will drive wildlfie managment in the future - if we see this now it can assist us, if we continue with our status quo, it will then drive us forward, without our vision involved... lets realise this and sit in the drivers seat, instead of taking the back seat... All of my comments are made with the most respect to individuals, the team and based on reality (at least how I see reality) - as always - as I'm sure everyone will know where the comments came from in the 1st place, so I have to add that important quilifier...

- The profile of this issue needs to be raised!
- I think the BCSSP is important but the name implies that separation is the ultimate and only goal, which I think is unrealistic and unattainable (see comments in #27 above). The name should possibly be changed. Maintaining a current, up to date, and easily accessible directory of domestic sheep and goat locations with respect to wild sheep populations is crucial, along with the communication and education of domestic sheep and goat owners. There may be opportunities to reduce the risk of contact that come out of these meetings, but actual separation in the vast majority of cases will likely not be an option, mostly due to the cost. these discussions
- a steady funding stream for the co-ordinators position is crucial to the long term survival of wild sheep that are in conflict with domestics
- If the provincial biologists had a responsibility to visit with the children in both the elementary and high school in regards to environmental issues (i.e. sheep included). Try and promote grassroots involvement through naturalist clubs, etc.
- The Peace has not been fully engaged in the Program to date due to the low risk, low staffing levels, and other priorities. Would be good to turn this around in the future.
- Get rid of the fencer, bring all 'wild sheep stakeholders in', work on education and public awareness, start a fire with current issues, make legislation the goal.